PROCEEDINGS

ONE HUNDRED AND FIFTEENTH ANNUAL MEETING

of the

UNITED STATES ANIMAL HEALTH ASSOCIATION

Adam’s Mark Buffalo Hotel
Buffalo, New York
September 29 – October 5, 2011
ABOUT USAHA

USAHA’s Mission...
The United States Animal Health Association is a forum for communication and coordination among State and Federal governments, universities, industry, and other concerned groups for consideration of issues of animal health and disease control, animal welfare, food safety and public health. It is a clearinghouse for new information and methods, which may be incorporated into laws, regulations, policy, and programs. It develops solutions of animal health-related issues based on science, new information and methods, public policy, risk/benefit analysis and the ability to develop a consensus for changing laws, regulations, policies, and programs.

USAHA MEMBERSHIP
State Official Agency Members (50)
Alabama              Indiana              Nebraska              South Carolina
Alaska                Iowa                  Nevada                South Dakota
Arizona               Kansas                New Hampshire         Tennessee
Arkansas              Kentucky             New Jersey             Texas
California            Louisiana            New Mexico            Utah
Colorado              Maine                New York              Vermont
Connecticut           Maryland             North Carolina        Virginia
Delaware              Massachusetts        North Dakota          Washington
Florida               Michigan            Ohio                  West Virginia
Georgia               Minnesota            Oklahoma              Wisconsin
Hawaii                Mississippi          Oregon
Idaho                 Missouri            Pennsylvania
Illinois              Montana

Federal Official Agency Members (11)
USDA, APHIS, Veterinary Services
USDA, Agriculture Research Service
USDA, Cooperative State Research, Education and Extension Service
USDA, APHIS, Wildlife Services
USDA, APHIS, Centers for Disease Control and Prevention
USDA, Science and Technology Directorate

USDHS, Office of Health Affairs
USDHS, U.S. Fish and Wildlife Service
USDHS, National Park Service
USDI, USGS, National Wildlife Health Center
USDOE, Lawrence Livermore National Laboratory

Territory and Sovereign Agency Members (2)
North Mariana Island
Navajo Nation

International Animal Health Agencies (4)
Australia
Canada
Mexico
New Zealand
ABOUT USAHA (continued)

Allied Industry Organizations (35)
Alpaca Owners & Breeders Association
American Association of Avian Pathologists
American Association of Bovine Veterinarians
American Association of Small Ruminant Practitioners
American Association of Swine Veterinarians
American Association of Veterinary Laboratory Diagnosticians
American Association of Wildlife Veterinarians
American Association of Zoo Veterinarians
American Dairy Goat Association
American Farm Bureau Federation
American Quarter Horse Assn./American Horse Council
American Sheep Industry Association
American Veterinary Medical Association
Association of American Veterinary Medical Colleges

Association of Fish & Wildlife Agencies
Battelle
Exotic Wildlife Association
Holstein Friesian Association USA, Inc.
International Lama Registry
Livestock Exporters Association, USA
Livestock Marketing Association
National Aquaculture Association
National Bison Association
National Cattlemen’s Beef Association
National Chicken Council
National Dairy Herd Improvement Association, Inc.
National Institute for Animal Agriculture
National Milk Producers Federation
National Pork Board
National Pork Producers Council
National Renderers Association
National Turkey Federation
North American Deer Farmers Association
North American Elk Breeders Association
U.S. Poultry & Egg Association

District Delegates
Northeast: S. Klopp; E. Zirkle
North Central: V. Green; J. Hawley
South: L. O. Lollis; A. G. Rosales
West: W. Sauble; H.M. Richards

Individual Members: 759
Life Members: 138
Student Members: 53
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An 11-gene multiplex PCR to detect the Seven Major Shiga Toxin-Producing *Escherichia coli* based on Genes that Code for Major Virulence Factors and Serogroup-Specific O-Antigens – J. Bai, Z. Paddock, X. Shi, S. Li, T. Nagaraja


Antimicrobial Susceptibility of Bacteria Isolated from Milk Samples Submitted to the Pennsylvania State Animal Diagnostic Laboratory – V. Linter, T. Matthews, T. Pierre, B. Jayarao, S. Kariyawasam

Comparison of Virus Isolation and Real-Time RT-PCR for Detection of Avian Influenza Virus and Newcastle Disease Virus in Cloacal Swabs of Poultry and Ducks – J.C. Pedersen, M.L. Killian, N. Hines, B. M. Martin, B. Schmitt, M. Reising

Detection of Shiga Toxin Producing *Escherichia coli* Serogroups O26, O45, O103, O111, O121, and O145 by Enzyme Linked Immuno Sorbant Assay – C. DebRoy, N. Hegde, B. Jayarao, V. Kapur, K. Lindpaintner, M. Muldoon

Differential Shiga Toxin Production among Shiga toxin-Producing *Escherichia coli* – C. DebRoy, N. Hegde, E. Roberts, B. Jayarao, V. Kapur


Identification of *Brucella canis* in Canine Blood by a Duplex Real-time PCR Assay – J. Bai, W. Fortney, T. Purvis, B. Lubbers, T. Nagaraja, G.A. Anderson

Identification of Lymphoproliferative Disease Virus in Wild Turkeys (*Meleagris gallopavo*) in the Southeastern United States – J. Brown, A. Allison, A. Cartoceti, S. Kubiski, B. Munk, N. Nemeth, K. Keel


Isolation and Molecular Characterization of Trout Infectious Pancreatic Necrosis Virus (IPNV) in Pennsylvania Aquaculture – H. Lu, K. Hillard

Isolation of a *Clostridium perfringens* type D Isolate Producing β2 Toxin and Enterotoxin From a Calf – Y. Zhang, J. Cui, A. Parkinson, M. Weisner, B. Byrum

Meta-Analysis on 15 Field Studies Comparing the Performance of the Skin test with the Gamma-Interferon Test (Bovigam®) for the Detection of Bovine Tuberculosis in Cattle – A. Raeber, B. Schroeder

Pathological Lesions and Patterns of Luciferase Luminescence in CD-1 Mice Exposed to Aerosol and Subcutaneous Infection with a Recombinant Neurovirulent Western Equine Encephalitis Virus – A. Phillips, T. Aboellail, K. Olson

Prevalence of Shiga Toxin Producing *E. coli* in Retail and Game Meat - C. DebRoy, H. Dang, K. Magwedere, E. Mills, C. Cutter

Prevalence of Virulence Genes in *Escherichia coli* Strains Recently Isolated from Piglets with Diarrhea Submitted to Iowa State University Veterinary Diagnostic Laboratory: 2006 to 2008 – S. Kariyawasam, C. Thompson, C. DebRoy, T. Denagamage

Quantitative Assessment of Adherent Bacteria in Porcine Intestines – S. Lanka, V. Perez, J. Pettigrew, C. Maddox

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I. 2011 Officers, Directors and Committees

A. Officers

2010-2011 Executive Committee
Seated, from left: Richard Breitmeyer, Immediate Past President; Steven Halstead, President; David Marshall, President Elect.
Standing, from left: Stephen Crawford, Second Vice President; David Meeker, First Vice President; William Hartmann, Treasurer; Bruce King, Third Vice President.
### B. USAHA Board of Directors, 2011

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<td>Max Van Buskirk</td>
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<td>Ernest Zirkle</td>
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<tr>
<td>Craig Shultz</td>
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<tr>
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<tr>
<td>James Logan</td>
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C. 2011 Committees

USAHA/AAVLD Committee on Animal Emergency Management
Co-Chairs: Marilyn Simunich, ID
Nick Striegel, CO

John Adams, VA
Bruce Akey, NY
Gary Anderson, KS
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Andy Schwartz, TX
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                                                        Ernest Zirkle, NJ

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Burke Healey, CO
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David Hunter, MT
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Bruce King, UT
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Steve Laughlin, OH
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Ernie Morales, TX
Henry Moreau, LA
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Sebastian Reist, NJ
Nancy Robinson, MO
Keith Roehr, CO
Thomas Roffe, MT
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David Schmitt, IA
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Andy Schwartz, TX
Charly Seale, TX
Daryl Simon, MN
Marilyn Simunich, ID
Fred Stevens, CA
Robert Stout, KY
Nick Striegel, CO
### I. C. USAHA Committees

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**Chair:** Michele Miller, FL  
**Vice-Chair:** Robert Hilsenroth, FL

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<td>Daryl Simon, MN</td>
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<td>Cleve Tedford, TN</td>
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<td>Robert M. Temple, OH</td>
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<td>Karl Kinsel, TX</td>
<td>Charles Thoen, IA</td>
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<td>Patrice Klein, MD</td>
<td>Brad Thurston, IN</td>
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<td>Terry Kreeger, WY</td>
<td>Kurt VerCauteren, CO</td>
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<td>Kimberly Wagner, WI</td>
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<td>Rick Wahlert, CO</td>
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<td>Ray Waters, IA</td>
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<tr>
<td>Konstantin Lyashchenko, NY</td>
<td>Ellen Wiedner, GA</td>
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</table>

**Brucellosis, cont’d**
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Richard Winters, Jr., TX
Peregrine Wolff, NV
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Taylor Woods, MO
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Glen Zebarth, MN

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### USAHA AAVLD Committee on Environment and Toxicology

**Co-Chairs:** Larry Thompson, MO  
Wilson Rumbeha, MI

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<td>Gary Weber</td>
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</table>

### USAHA AAVLD Committee on Food and Feed Safety

**Chair:** Bonnie Buntain, CAN  
**Vice Chair:** John Ragan, MD

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## I. C. USAHA Committees

### Food and Feed Safety, cont’d

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### Committee on Foreign and Emerging Diseases

Chair: Paul Gibbs, FL  
Vice Chair: Tammy Beckham, TX

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Foreign and Emerging Diseases, cont’d

Rick Hill, IA
Donald Hoenig, ME
Sam Holland, SD
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Thomas Kasari, CO
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Michael Parker, DC
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Boyd Parr, SC
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Emi Saito, CO
Mo Salman, CO
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Jack Schlater, IA
David Schmitt, IA
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Katie Steneroden, CO
Nick Striegel, CO
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David Swayne, GA
R. Flint Taylor, NM
David Thain, NV
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Larry Williams, NE
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I. C. USAHA Committees

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Saul Wilson, Jr., AL         Richard Winters, Jr., TX
George Winegar, MI           Ching-Ching Wu, IN

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Stan Bruntz, CO                William Pittenger, MO
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Floyd Horn, MD                 Annette Whiteford, CA
Dudley Hoskins, DC            Brad Williams, TX
Laurie Hueneke, DC             William Wilson, KS
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Ralph Knowles, FL              Richard Winters, Jr., TX
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I. C. USAHA Committees

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Dale Grotelueschen, NE
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Rod Hall, OK
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Bruce King, UT
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Howard Lehmkuhl, IA
Rick Linscott, ME
Pat Long, TN
Janet Maass, CO
Richard Mock, NC
Cheryl Nelson, KY
Jeanne Rankin, MT
Julia Ridpath, IA
Bill Sauble, NM
Nick Striegel, CO
R. Flint Taylor, NM
George Teagarden, KS
Susan Tellez, TX
Robert M. Temple, OH
Charles Thoen, IA
Kenneth Throlson, ND
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Annette Whiteford, CA
Brad Williams, TX
William Wilson, KS
George Winegar, MI

Committee on Infectious Diseases of Horses
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C. Black, GA
Yugendar Bommineni, NM
Becky Brewer-Walker, AR
Charlie Broaddus, VA
Stan Brunzt, CO
Suzanne Burnham, TX
Clarence Campbell, FL
Craig Carter, KY
Tony Caver, SC
Stephen Crawford, NH
Glenda Davis, AZ
Edward Dubovi, NY
Adam Eichelberger, SC
Leonard Eldridge, WA
Dee Ellis, TX
J. Amelita Facchiano, TX
Dave Fly, NM
Katherine Flynn, CA
Edward 'Rusty' Ford, KY
Tony Frazier, AL
Robert Gerlach, AK
Paul Gibbs, FL
Kristin Haas, VT
Nancy Halpern, NJ
Steven Halstead, MI
I. C. USAHA Committees

Inf. Diseases of Horses, cont'd

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Greg Hawkins, TX  Eileen Ostlund, IA
Burke Healey, CO  Boyd Pitts, GA
Carl Heckendorf, CO  Bob Pitts, GA
Terry Hensley, TX  Jewell Plumley, WV
Michael Herrin, OK  Sebastian Reist, NJ
Floyd Horn, MD  Keith Roehr, CO
Dudley Hoskins, DC  Dennis Schmitt, MO
Bruce King, UT  Andy Schwartz, TX
Ralph Knowles, FL  Michael Short, FL
Don Knowles, WA  Marilyn Simunich, ID
Maxwell Lea, Jr., LA  Robert Stout, KY
Donald Lein, NY  R. Flint Taylor, NM
Mary Lis, CT  David Thain, NV
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</tbody>
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<thead>
<tr>
<th>Name</th>
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<tr>
<td>Deborah Brennan</td>
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<td>William Edmiston Jr. DVM</td>
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<td>David Winters</td>
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<tr>
<td>Cindy Wolf</td>
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Committee on Transmissible Diseases of Swine
Chair: Harry Snelson, NC
Vice Chair: Lisa Becton, IA

| Paul Anderson, MN | Elizabeth Lautner, IA |
| Marianne Ash, IN | James Leafstedt, SD |
| C. Black, GA | Donald Lein, NY |
| Becky Brewer-Walker, AR | Tsang Long Lin, IN |
| Corrie Brown, GA | Bret Marsh, IN |
| Tom Burkgren, IA | David Marshall, NC |
| Jim Collins, MN | Chuck Massengill, MO |
| Stephen Crawford, NH | James McKean, IA |
| Effingham Embree, Jr., IL | David Nolan, KS |
| Mark Engle, TN | Sandra Norman, IN |
| James Foppoli, HI | Gary Osweiler, IA |
| Tony Forshey, OH | Kristine Petrini, MN |
| Nancy Frank, MI | Tom Ray, NC |
| Cyril Gay, MD | Mo Salman, CO |
| Michael Gilisdorf, MD | David Schmitt, IA |
| Thomas Hagerty, MN | Rick Sibbel, IA |
| Rod Hall, OK | Dennis Slate, NH |
| James Mark Hammer, NC | Paul Sundberg, IA |
| William Hartmann, MN | Seth Swafford, MO |
| Greg Hawkins, TX | Brad Thacker, MD |
| Michael Herrin, OK | Paul Ugstad, NC |
| Sam Hines, MI | Patrick Webb, IA |
| Sam Holland, SD | Hector Webster, CA |
| Rex Holt, GA | Margaret Wild, CO |
| Ken Horton, TX | Larry Williams, NE |
I. C. USAHA Committees

Transmissible Diseases of Swine, cont’d

Ellen Wilson, CA
George Winegar, MI

Nora Wineland, MO
Paul Yeske, MN

Committee on Tuberculosis

Chair: William Hartmann, MN
Vice Chair: Dustin Oedekoven, SD

John Adams, VA
Bruce Akey, NY
Wilbur Amand, PA
Robert Angus, ID
Joan Arnoldi, WI
James Averill, MI
Joe Baker, NM
Lowell Barnes, IN
Bill Barton, ID
Derek Belton, NZL
Warren Bluntzer, TX
Steven Bolin, MI
Richard Breitmeyer, CA
Becky Brewer-Walker, AR
Charlie Broaddus, VA
Charles Brown, II, WI
Matt Byrne, CA
Mike Chaddock, DC
John Clifford, DC
Michael Coe, UT
Jim Collins, GA
Kathleen Connell, WA
Thomas Conner, OH
Walter Cook, WY
Daniel Crowell, NV
Donald Davis, TX
Thomas DeLiberto, CO
Scott Dewald, OK
Jere Dick, MD
Leah Dormon, OH
Brandon Doss, AR
Phil Durst, MI
Michael Dutcher, WI
Reta Dyess, TX
Anita Edmondson, CA
Leonard Eldridge, WA
Dee Ellis, TX
Steven England, NM
Donald Evans, KS
John Fischer, GA
Dave Fly, NM

James Foppoli, HI
W. Kent Fowler, CA
Nancy Frank, MI
Clifford Frank, MO
Tam Garland, TX
Robert Gerlach, AK
Michael Gilsdorf, MD
Velmar Green, MI
Thomas Hagerty, MN
Rod Hall, OK
Steven Halstead, MI
Beth Harris, IA
Burke Healey, CO
Carl Heckendorf, CO
Bob Hillman, ID
Donald Hoenig, ME
Sam Holland, SD
Dennis Hughes, NE
John Huntley, WA
Pamela Luisa Ibarra, MEX
Billy Johnson, AR
Jon Johnson, TX
Shylo Johnson, CO
John Kaneene, MI
Susan Keller, ND
Paul Kohrs, WA
Steve Laughlin, OH
Carolyn Laughlin, OH
John Lawrence, ME
Maxwell Lea, Jr., LA
Rick Linscott, ME
Sharon Lombardi, NM
Konstantin Lyashchenko, NY
Daniel Manzanares, NM
Bret Marsh, IN
Chuck Massengill, MO
Paul McGraw, WI
Robert Meyer, WY
Susan Mikota, TN
Michele Miller, FL
Ernie Morales, TX
I. C. USAHA Committees

Tuberculosis, cont’d

Henry Moreau, LA  R. Flint Taylor, NM
Jeffrey Nelson, IA  George Teagarden, KS
Cheryl Nelson, KY  Tyler Thacker, IA
Kenneth Olson, IL  David Thain, NV
Mitchell Palmer, IA  Charles Thoen, IA
Elizabeth Parker, DC  Lee Ann Thomas, MD
Janet Payneur, IA  Kenneth Throlson, ND
Kristine Petrini, MN  Paul Ugstad, NC
Dale Preston, TX  Michael VanderKlok, MI
Alex Raeber, CHE  Arnaldo Vaquer, VA
John Ragsdale, NM  Jesse Vollmer, ND
Jeanne Rankin, MT  Ray Waters, IA
Suelee Robbe-Austerman, IA  Scott Wells, MN
Nancy Robinson, MO  Jay Whetten, NM
Keith Roehr, CO  Diana Whipple, IA
Mo Salman, CO  Richard Willer, HI
Bill Sauble, NM  Brad Williams, TX
Shawn Schaefer, ND  Ross Wilson, TX
Irene Schiller, CH  Kyle Wilson, TN
David Schmitt, IA  George Winegar, MI
Stephen Schmitt, MI  Josh Winegamer, TX
Dennis Schmitt, MO  David Winters, TX
Andy Schwartz, TX  Jill Bryar Wood, TX
Charly Seale, TX  Ching-Ching Wu, IN
Laurie Seale, WI  Stephanie Yendell, MN
Daryl Simon, MN  Glen Zebarth, MN

Committee on Wildlife Diseases
Chair: Stephen Schmitt, MI
Vice Chair: Colin Gillin, OR
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II. 2011 Annual Meeting Proceedings
   A. USAHA/AAVLD President’s Reception and Dinner
   B. USAHA/AAVLD Plenary Session
   C. USAHA Scientific Papers, Posters and Abstracts
   D. USAHA Membership Meetings
   E. Committee Reports
   F. Other Reports
A. USAHA/AAVLD President’s Reception and Dinner

INVOCATION

David L. Meeker

MEMORIAL SERVICE

David T. Marshall

Fellow colleagues, let us humbly pause in our busy lives to remember those who will not be with us this evening because of their passing. We often find ourselves taking the gift of life for granted, only to be reminded of its frailty by an empty seat at a meeting, or the inability to call and benefit from the veteran wisdom of a departed colleague. We’re blessed by the past contributions to our organizations that each has contributed, as well as the friendship and memories we enjoyed and are left behind. We wish for continued strength to their families and colleagues, and that we are able to carry on their work in the same dedicated manner that they would have intended.

Please take a moment and reflect on these individuals as I read their names:

Richard Omohundro, Arizona
Lawrence Morehouse, Missouri
John Fitch, Arkansas
Clyde Kirkbride, South Dakota
Edward Wilson, Maryland
J. Lindsay Oaks, Washington
Norvan Meyer, Virginia
Roger Olson, Maryland
Mitchell Essey, Maryland
David Morris, Colorado
Robert Frost, California

I would also like to take a moment in memory of Bob Frost, who served as USAHA President in 2003. Bob lost a courageous battle with cancer in August, and is most recognized for his outreach to wildlife organizations in addressing animal health and championing the evolution of the laboratory structure both in the United States and with Canada and Mexico.

Please join me in a moment of silent prayer in remembrance of these deceased members. Amen.
I’m pleased to welcome the U.S. Animal Health Association to Buffalo. As someone who grew up on a dairy farm and having been involved with many different aspects of farming throughout my life, I appreciate the importance of the work done by all of you. There are few callings more noble than protecting animal health and, ultimately, our nation’s food supply. While the business conducted New York City gets a lot of attention nationally, I assure you:

New York is most definitely an agricultural state:

- 7 million acres of land are in production on over 36,000 farms.
- Our state’s 6,000 dairy farms produced over 12 billion pounds of milk in 2010.
- New York farms had a net cash income of nearly 1.2 Billion dollars last year and that’s not counting income generated by processors and other ag-related industries.

The future of agriculture in New York is bright.

- We’ve had several new dairy processors come on line in the past few years and we’re looking at a significant expansion in the state’s dairy herd.
- We opened a new Veterinary Diagnostic Laboratory on the Cornell Campus in Ithaca. The lab was completed on schedule, under budget, and its current operating expenses are below initial estimates due to its LEED Gold Certification.
We also have challenges that will test us in years to come:

- Tropical storms Irene and Lee caused widespread flooding and damage throughout the Northeast. Our friends in the Southwest are facing the worst droughts in anyone’s memory. Regardless of where you come down on the cause of climate change, it’s reasonable to expect we’ll be seeing more extreme weather and being ready to assist producers as they recover from these disasters will be important to all of us.

- We’re seeing animal diseases such as neurologic EHV in horses, EHD in deer, white-nose syndrome in bats, and other diseases we haven’t seen before. I’ll let the vets in the audience decipher why we’re seeing these new problems, but I will predict that being prepared to diagnose, and to build effective control or containment strategies for emerging animal health issues will be keeping your members very busy for years to come.

Despite these challenges, I can’t help but be encouraged as I meet and talk with USAHA members. Your professionalism and dedication really shines through. Governor Andrew Cuomo and I wish each and every one of you a productive meeting here in Buffalo and I thank you for coming to our wonderful state.

INVITATION TO NORTH CAROLINA

David T. Marshall

On behalf of the USAHA and the AAVLD, I’d like to thank you Commissioner Aubertine for the gracious welcome to the State of New York. I personally have thoroughly enjoyed my first few days here in the Buffalo
area, and even remembered to bring my passport! Don Lein has been bragging about the “ice wines” for years now, and I can personally attest that they are as advertised. The cheese isn’t bad, either.

It is truly my honor to invite all 50 states and the world to Greensboro, North Carolina for next year’s 116th annual USAHA and 55th annual AAVLD meetings. The event will be held at the Sheraton Greensboro Four Seasons Hotel and its adjoining Koury Convention Center, the largest complex of its type between Washington, DC and Atlanta, and one that has distinguished itself for exceptional facilities, service, and attention to detail. Many of you will remember this facility hosting our annual meeting in both 2004 and 2008, and might agree that the facility, meeting rooms, and cost are on par with any site where we have met previously and are conducive to a very productive meeting.

Mid-October in North Carolina typically is both beautiful and temperate, and while we don’t profess to be able to compete with San Diego for sun and fun, I can pretty much assure you it won’t snow like it did in Minnesota a year ago! Greensboro is a vibrant city of a quarter million in the heart of the state with numerous attractions of interest in the immediate area. From the complex itself, to the adjoining Four Seasons premier shopping complex, to the local attractions, our department and staff will strive to offer you a brand of Southern hospitality to which many of you have become accustomed.

A less than exhaustive historical research effort indicates that I may have the dubious honor of being the only or one of the few recent USAHA presidents to host the meeting in the same year as holding the organization’s presidency. Despite that challenge, it will be our distinct honor to host this meeting and look forward to your visit. Please feel free to contact me or any of my staff if we can be of service between now and the meeting next October. Thank you.
II. A. USAHA/AAVLD PRESIDENT’S RECEPTION AND DINNER

SPONSOR’S RECOGNITION

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II. A. USAHA/AAVLD PRESIDENT’S RECEPTION AND DINNER

AAVLD PRESIDENT’S REMARKS

Craig N. Carter

Good evening, fellow officers, members, friends and international guests. A very special welcome to our distinguished Iraqi colleagues here at the head table. It is so nice to have Dr. Andrew Soldan with us as President of the European Association of Veterinary Laboratory Diagnosticians. It is so uplifting to see you all at this spectacular event in beautiful Buffalo. In May of this year we dedicated our new laboratory facility in Lexington. Kentucky’s first lady, Jane Beshear, was there to do the honors. After my remarks, mostly thanking everyone for their efforts in making the building a reality, I sat down next to her and whispered, “Sorry I was so long.” After the ceremony she scolded me and said, “Craig, you must thank everyone in these situations no matter how long it takes!” So here I go!

Heartfelt thanks to our esteemed colleague and friend Dr. Don Lein for his generosity and for a warm reception here in New York. I extend much gratitude to all the folks behind the scenes who worked so hard to make this meeting and this event a huge success—Ben Richey, Linda Ragland, Vanessa Garrison, and Jackie Cassarly to name just a few, please forgive me for not recognizing everyone by name. We are so very grateful for our generous sponsors who made this meeting possible. We thank all the attendees, speakers, and poster presenters who are bringing the meeting to life and make it an unforgettable educational event. Finally I want to congratulate our Program Committee, under the leadership of Drs. Tim Baszler and David Marshall for the exceptional program and C.E. they have put together for us—no small task. Finally, I have to thank my hard-working faculty and staff of my lab back in Kentucky.
Congratulations to our incoming Vice President, Catherine Barr, our new Southeast representative on the Executive Board, Lanny Pace, and our Northeast representative Sandy Bushmich. Serving as president this year has been a particularly special honor for me. It has also been amazing to experience firsthand the incredible dedication and energy of our Officers, Executive Board, and Committee Chairs. They make the president’s job easy and they continue to strengthen the Association. Tomorrow, we will pass the gavel on to President-elect Dr. Tim Baszler. Tim has made so many significant contributions to the AAVLD in the past and we all know that he will continue under his skilled leadership. I am here to report to you tonight, the AAVLD is in expert hands.

It’s been a very busy year. Jerry Saliki and his team moved JVDI to Sage Publishing opening up lots of opportunities. It is interesting to note that over 40% of our manuscripts come from outside the US—JVDI has truly become a strong international publication. Tim Baszler and Tom McKenna implemented the Scholar One abstract software for this meeting, Dave Steffen and Vanessa Garrison overhauled our web site. Gary Anderson and Valerie Ragan have created 8 travel assistance grants through our Foundation for veterinary students to learn about diagnostic veterinary medicine in conjunction with the Center for Public and Corporate Practice at Virginia Tech. Under the leadership of Barb Powers, the AAVLD Executive Board hired our lobbyist, Mr. Brad Mollet of Capitol Partners, who has already achieved much success in our fight to preserve and expand the funding of the NAHLN. I must thank the AVMA, AAVMC, and USAHA and our AAVLD members for their strong support in this effort. Finally, the Executive Board believes that the AAVLD has arrived at a critical crossroads in the evolution of the association and are continuing the quest toward an Executive Director for the AAVLD. And this list is only a sampling of the work that has been undertaken this year.

I have really enjoyed working with USAHA President Dr. Steve Halstead and the entire USAHA Executive Board. They have all been very supportive of the AAVLD this year as in years past. I want to recognize USAHA Executive Director Ben Richey, Linda Ragland, Kelly Janicek, Kim Sprout and the rest of the USAHA team for the outstanding support they provide for both associations throughout the year. Within the AAVLD, I want to personally thank Gary Anderson for his guidance this year, Tim Baszler, Tom Mckenna, and the endless energy and ideas of John Adaska, our Secretary-Treasurer. Finally, I would have been totally lost without our dedicated and talented administrative staff officer, Vanessa Garrison. I must also thank the dozens of committee chairs, the House of Delegates and members in both the AAVLD and the USAHA for all of your contributions. Finally, I send a big hug and lots of love to my wonderful wife, Ronda, who has given me her full support this year.

We are living in difficult times. Americans are spending over $2 trillion every year on healthcare. The world’s population will double in the coming
decades and so will the demand for wholesome food. But quoting Dr. Jim Steele, the father of veterinary public health: You can’t have good human health without good animal health, and you can’t have good animal health without good human health. We must find the means of achieving this, but it will not be easy. Our economic situation is equally challenging. But as this unfolds and our Congress strives to eliminate unnecessary programs and spending in government, we must work untiringly to guard against throwing the proverbial baby out with the bathwater. By that I am referring to the elimination of programs in government that are effective and which pay back handsomely to the US economy and public health — our NAHLN is the perfect example of this. Barb Martin and her team have done an incredible job in building and operating the NAHLN — it is absolutely critical that we find ways to support and grow this model program.

Sometimes I think we don’t fully appreciate the impact and scope of the work we do. So before I close, I’d like to share a little story with you. About a week ago I received an email from Professor Masood Rabbani, Director of the University Diagnostic Laboratory in Lahore, Pakistan. I learned a few days ago from Drs. Mark Robinson and Bob Smith that Dr. Rabbani has succeeded in achieving ISO 17025 status for his laboratory and is setting the stage for many other goals. He dreams of establishing a network of veterinary diagnostic laboratories and an association of veterinary laboratory diagnosticians in Pakistan. He told me that he has been inspired by the USAHA, AAVLD and NAHLN. He sees what we have achieved as a model for animal health and diagnostic veterinary medicine worldwide. It’s difficult for me tonight to think of a more powerful compliment to all of you in the audience!

Before I close, please keep watching for more information on the upcoming EAVLD meeting to be held in Poland in July 2012 and the WAVLD meeting in Berlin in 2013.

So, once again, thank you my fellow officers and members, for everything you do to make diagnostic veterinary medicine the best it can be for animal agriculture, companion animals and public health.
Good evening everyone. As I prepared my thoughts for this evening, I sought feedback from my colleagues that have stood before this audience in the past. The most common theme was to be brief, along with some honest appraisals that I have great potential to be wordy.

As I have spent a number of years as an audience member at this event, my experience is that one can usually remember the first part and the wrap up, but tend to be fuzzy on that part in the middle. So, I offer the first part.

Tonight – this dinner – is a pause in the dedicated work of this annual meeting of our organizations to celebrate our successes, our relationships, and our good fortunes. It is an opportunity to celebrate our memories of friends and colleagues no longer with us, and to honor their lives and contributions.

Likewise, for me, it is an opportunity to celebrate my appreciation. As president, I had the fortunate opportunity to travel to each of our district meetings over the past year. I would like to thank each of our gracious hosts: Dr. Marty Zaluski, Western District; Drs. Richard Wilkes and James Watson, Southern District; Drs. Kristen Haas and Heather Hirst, Northeast District; and Drs. Mark Ernst and Dustin Oedekoven, North Central District.

Being a part of this USAHA Executive Committee has been one of the greatest experience of my career, and I wish to thank each of the members who have worked with me over the past year: David Marshall, President Elect; David Meeker, 1st Vice President; Steve Crawford, 2nd Vice President; Bruce King, 3rd Vice President; Bill Hartmann, Treasurer and my predecessor Rich Breitmeyer, Past President.
II. A. USAHA/AAVLDPRESIDENT’S RECEPTION AND DINNER

And I wish to recognize our staff, truly an asset to have their support for our organization: Ben Richey, executive director; Kelly Janicek, executive assistant; Linda Ragland, meeting coordinator; and Kim Sprout.

And now for the last part, there is one person that deserves a special thank you. For support, encouragement, and tolerance, wife of five years and counselor, coach, companion and best friend for 17 years, Robin.
II. A. USAHA/AAVLD PRESIDENT’S RECESSION AND DINNER

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Trace First, LTD
TREK Diagnostic Systems
Advanced Technology Corp. (VADDS)
VLA Scientific
Good evening to you all. I’m very pleased to be here to present this year’s APHIS Administrator’s Award. It will go to an individual who has made significant, consistent contributions to improving the health of U.S. animals in agriculture.

It is also a symbol of APHIS’ esteem for all of you, our longstanding partners in animal health.

When the group that was to become USAHA held its very first annual meeting back in 1897, cattle tick fever was at the top of the agenda. Several years later, USDA instituted its National Cattle Fever Tick Eradication Program, which continues to this day.

One hundred and fifteen meetings later, we are still building on that remarkable tradition of working together to improve America’s animal health.

Dr. Greg Parham, who spoke at last year’s dinner and is now APHIS’ new administrator, regrets that he can’t be here tonight. As a veterinarian himself, he wanted you to know how much he appreciates our partnership and looks forward to continuing our good work together.

He also asked me to say just a few words about two important animal health initiatives of ours: VS 2015 and One Health.

We want you to know that even in these uncertain times, APHIS intends to uphold its tradition of offering essential services that help keep agricultural animals healthy and businesses thriving.

But APHIS also needs to be a 21st century agency that can adapt to changing technologies, streamlined budgets, and increasing trade, which brings the potential for new animal diseases as well as wealth to enter our country.

That is what our VS 2015 initiative is all about. It’s about improved efficiency, enhanced diagnostics and disease management, and quick and effective emergency management. Most important, VS 2015 is about building ever-broader animal health networks with people like you.

Our priority issues for this year and the next include:

- Establishing more flexible, transparent regulatory frameworks for animal disease traceability and other issues;
- Addressing pressing import-export issues;
- Fine-tuning our readiness and response to emergencies, and our surveillance tools; and,
- Integrating One Health activities into our daily work.

I’d like to expand a little on that last point.
Although we focus on the health of animals, we are also aware of how inextricably linked animal (including wildlife), human, and ecological health have become.

This isn’t a new idea. But it is an increasingly urgent one. That is whyAPHIS is contributing its expertise, infrastructure, and systems to partnerships that span counties, states, and countries to promote animal, human, and ecological well being — the One Health vision.

We created a One Health Working Group in 2009 to help define our vision and to provide U.S. leadership for the animal health component of One Health.

This workgroup transitioned to a pilot One Health Coordination Office last January to implement our One Health strategic plan.

Partnerships are essential for addressing the connections among human, animal, and environmental health and we encourage and welcome the participation of partners like you. This is a relatively new road for us to travel, but I have no doubt that together, we will find our way.

In honor of our tradition of partnership, I’d like to now present this year’s APHIS Administrator’s Award—to an individual who is a tradition of his own.

That person is Dr. Donald Henry Lein, Professor Emeritus at Cornell University.

A professor…researcher…advocate…subject-matter expert…a much-admired role model for young veterinarians…and a volunteer: Don is a household name in our circles.

He exemplifies not only the best of the past, but also the quest for the new, and the value of collaboration.

Don graduated from Cornell University’s veterinary school in 1957 and ended up planting his roots deep in Ithaca’s countryside—not far as the crow flies from where we are now.

He joined Cornell in 1965 as a researcher. About a decade later, he was named Associate Professor and Director of Theriogenology, and by 1980, he had become Associate Professor of Theriogenology and Pathology—a position he held for the next 23 years.

Don developed a reputation for being a personable, engaging instructor who was much loved by his students for his sense of humor and his passion for excellence.

APHIS’ own associate deputy administrator of Veterinary Services’ (VS) Emergency Management and Diagnostics, Dr. Jose Diez, was one of those students. Jose is here this evening. Don taught him to palpate cows, among many other useful skills.

Jose recently received a Presidential Rank Award for his service to USDA and to our country. We know this triumph was thanks in no small part to those unforgettable experiences at Cornell.

While Don was teaching, he was also writing. He produced more than 100 publications in scientific and lay journals.
And while Don was writing, he was making countless presentations at scientific, industry, and public meetings. And while Don was presenting, he was also out there collaborating with his colleagues in animal health.

He was the associate director of the New York State Diagnostic Laboratory from 1980 until 1987. He was the lab’s director until 2000, and came back again in 2001 — the year of his alleged “retirement” from Cornell — to serve as director for several more years.

But we know people like Don never really retire. They just change horses and ride on.

Don is the only person to have served as president of both AAVLD and USAHA. In fact, he was USAHA’s president in 2004, when I was appointed Deputy Administrator of APHIS’ Veterinary Services program.

Don has worked closely with APHIS throughout the years, as well. He served on our Wildlife Services Advisory Committee and was a member of our Tuberculosis National Research and Study Group.

Don’s commitment to the cause of animal health has also served him well in his work on advisory committees and councils for the Food and Drug Administration’s Center for Veterinary Medicine, the National Association of State Departments of Agriculture, and the American Veterinary Medical Association’s Council on Public Health, Regulatory and Military Services.

Most recently, he has served as the chair of the Johne’s Disease Integrated Program External Advisory Board, and has also chaired the Northeast Raccoon Oral Rabies Vaccination Plan.

Don, the animal health community is grateful for your lifetime of service and for your invaluable contributions to ensure the continued strength and vitality of our livestock industries. We all thank you.

On behalf of Administrator Parham, please join me in congratulating Dr. Donald Lein, the 2011 winner of the APHIS Administrator’s Award.
II. A. USAHA/AAVLD PRESIDENT’S RECEPTION AND DINNER

Dr. Donald H. Lein is presented with the APHIS Administrator’s Award from Dr. John Clifford.
II. A. USAHA/AAVLD PRESIDENT’S RECEPTION AND DINNER

AAVLD AWARDS

Gary Anderson

Distinguished Service Award
Dr. Clyde Kirkbride

Trek Award for Excellence in Diagnostic Veterinary Microbiology
Dr. William Fales

Pioneers in Virology Award
Dr. Fred Scott and Dr. Skip Carmichael

Richard L. Walker Bacteriology Award
Dr. Leslie Bower

J. Lindsay Oaks Bacteriology Award
Dr. Nubia Macedo

Best Oral Presentation
Dr. Elisa Salas

Best Poster
Dr. Kristen Bass

Best JVDI Manuscript
Dr. Torsten Seuberlick

AAVLD Trainee Travel Awards
Dr. Karan Agrawal, Cornell University
Dr. Barbara Brito, CAHFS, UC Davis
Dr. Maria Clavijo, University of Minnesota
Dr. Federico Giannitti, CAHFS, UC Davis
Dr. Valerie Johnson, Colorado State University
Dr. Jennifer Lamoureux, Michigan State University
Dr. Nubia Macedo, University of Minnesota
Dr. Chika Okafor, Michigan State University
Dr. Guillermo Rimoldi, CAHFS, UC Davis
Dr. Artem Rogovskyy, Washington State University
Dr. Barbara Szonyi, Texas A&M

CPCVM Travel Awards (sponsored by AAVLD)
Dr. Elle Glueckert, Michigan State University
Dr. Greta Krasfur, Colorado State University
Dr. Kathleen O’Hara, Cornell University
II. A. USAHA/AAVLD PRESIDENT’S RECEPTION AND DINNER

Dr. Elise Ackley, Louisiana State University
Dr. Linda Huang, VA-MD Regional College of VM
Dr. Mee-La Lee, University of Wisconsin

AAVLD/ACVP Diagnostic Pathology Resident/Graduate Student Award
Dr. Federico Giannitti
II. A. USAHA/AAVLD PRESIDENT’S RECEPTION AND DINNER

**AAVLD E.P. POPE AWARD**

Gary Anderson

The E. P. Pope Memorial Award is presented in memory of Dr. Edward P. Pope, who was one of the founders of the American Association of Veterinary Laboratory Diagnosticians (AAVLD) and who served with distinction as its Secretary-Treasurer from 1950 to 1972. The award was established in his honor in 1974. The Pope Award is the highest award given by the Association and is presented to an individual who has made noteworthy and significant contributions to the Association in regard to implementing and advancing the recognition of the specialty of veterinary diagnostic laboratory medicine.

The 2011 E.P. Pope Memorial Award is presented to Dr. Barbara E. Powers of Colorado State University. Dr. Powers has worked tirelessly for many years on behalf of animal health and laboratory diagnosticians throughout North America, and her list of achievements and service to AAVLD is long: member of the Accreditation Committee for 12 years (1998–2010); member of the Executive Board for 5 years (2001–2006); chair of the Foundation Committee for 4 years (2002–2006); AAVLD Vice President, President-Elect, and President (2006–2007); chair of the Nominations and Awards Committees (2007–2008); co-chair of the Government Relations Committee (2006–2008); AAVLD liaison to the Government Coordinating Council since 2006; member (2006–2008) and then chair (2008) of the National Animal Health Laboratory Network (NAHLN) Steering Committee; and most recently, co-chair of the Joint AAVLD/U.S. Animal Health Association Committee on the NAHLN.

Dr. Powers, originally from Schenectady, New York, received her BS degree in 1977, and her MS and DVM degrees in 1981 from Purdue University. She then moved to Colorado State University (CSU) where she earned her doctorate in veterinary pathology in 1986. She became a Diplomate in the American College of Veterinary Pathologists in 1987. Dr. Powers has spent her entire academic career at CSU, moving up the ranks from assistant to full professor, where she continues to be a respected and effective teacher of pathology for veterinary and graduate students, serving on nearly 50 graduate student committees—all an indication and strong testament to her mentoring skills. Dr. Powers has served as the director of the CSU Veterinary Diagnostic Laboratory since 1998. She has received numerous honors and awards, including the Smith Kline Beecham Research Award in 1993, the Colorado Veterinary Medical Association (CVMA) Outstanding Faculty of the Year Award in 2002, and the CVMA Veterinarian of the Year Award in 2005. In 2004, she was recognized for the Best Manuscript of the Year by the *Journal of Veterinary Diagnostic Investigation*. Dr. Powers also served her state organization as a member of the Board of Directors and then as President of the CVMA. In addition to her service, Dr.
Powers has authored and/or contributed to over 200 abstracts and presentations, has been an invited speaker numerous times, and has published over 180 refereed manuscripts.

It is an honor and privilege to present the E.P. Pope Award to Dr. Barbara Powers, a distinguished scholar, diagnostician, and devotee to advancing animal health throughout the United States.

AAVLD Past President Dr. Gary Anderson presents Dr. Barbara Powers with the E.P. Pope Award.
USAHA is pleased to announce this evening the unveiling of a new award to recognize our federal partners that work closely with USAHA members on a regular basis. The USAHA Federal Service Award is designated for the recognition of a federal employee that has demonstrated commendable service to the betterment of animal health in the United States. Candidates can be employed at any level of an Official Agency Member of USAHA. The recipient should exemplify partnership with states and industry stakeholders through leadership, expertise and/or accomplishments. The recipient need not be a member of USAHA, but have a positive impact on animal health related to the work of USAHA. Tonight we would like to honor two individuals.

Our first recipient has been an employee of USDA-APHIS Veterinary Services since 1990, serving in a variety of capacities. Following graduation from veterinary school and achieving a master’s degree in education, our recipient served a brief time as a practitioner in Georgia. He was then called to public service as a veterinary medical officer in Nebraska and then Wisconsin. He served eight years as the Area Epidemiology Officer, eventually becoming the Area Veterinarian in Charge for Wisconsin.

In 2002, he was named Associate Regional Director for the Western Region for USDA. During the 2002-2003 Exotic Newcastle Disease Outbreak he served as the Joint Area Commander and Incident Commander in California, earning the highest respect of his peers. This led to his current role as Eastern Region Director for Veterinary Services, which he assumed in 2005 and continues today. He has been an active leader on numerous investigations on Salmonella, foot-and-mouth disease, low-path avian influenza, exotic Newcastle disease and high-path avian influenza. His collaborative efforts throughout his career have been held in high regard across the US, and among many USAHA members, both past and present. He has also demonstrated strong support for the work of USAHA and its annual meeting.

We are pleased to offer our gratitude to Dr. Jack Shere with the 2011 Federal Partnership Award.
II. A. USAHA/AAVLD PRESIDENT’S RECEIPTION AND DINNER

Dr. Halstead presents Dr. Jack Shere with the 2011 Federal Partnership Award.

Our next recipient has held a strong presence representing Veterinary Services for 34 years. He received his DVM from Michigan State University in 1975, entering private practice in Rhode Island. In 1977 he joined the USDA APHIS, Veterinary Services, where he was a field Veterinary Medical Officer in Colonie, New York, until 1981. He later advanced his career and became the Assistant Area Veterinarian in Charge in 1981 in Albany, New York, where he remained until 1984. In 1984 he was selected as the Area Veterinarian in Charge for VS New England, where he remains today. During his time with the USDA, he has been on several incidents ranging from Exotic New Castle Disease in California, Avian Influenza in Pennsylvania and Virginia, Tuberculosis in Minnesota and California, to Foot and Mouth Disease in England. He is qualified as Incident Commander and held this position on several incidents. He coordinated the Eastern Region’s Accelerated Pseudorabies Eradication Program and was the Lead for the Veterinary Services’ review team of Australia’s TB program in 2006. Prior to implementing the National Incident Management Team system, he was the Assistant Director on the READEO emergency response teams from 1984-2001. As AVIC in New England, he was responsible for the Belgium Sheep Disposal Incident in Vermont in 2001.

This individual has been and still remains very dedicated to the efforts of Veterinary Services and assisting the states in insuring that together we remain strong in keeping any animal disease out of the country. In his 27 years as AVIC, he has become well adept at managing the 6 states in his jurisdiction, and the different personalities, political structures and animal health issues that affect that region. He is very well respected by his peers.
and all who have worked with him or for him. He constantly leads by example and is very instrumental in the development of our future leaders in Veterinary Services. Tonight, let us recognize and Dr. Bill Smith with the 2011 Federal Partnership Award.

Dr. Halstead presents Dr. Bill Smith with the 2011 Federal Partnership Award.
The USAHA Medal of Distinction is awarded annually to recognize one or more distinguished USAHA members who have demonstrated outstanding leadership, provided exemplary service, and have made significant contributions to the advancement of the Association.

The Executive Committee has selected a very deserving honoree this year, among an excellent cadre of nominations received.

Tonight’s honoree was born in Medina, Texas, in 1944 and was reared on a small ranch in central Texas. He holds degrees in Veterinary Science, ’70, and Veterinary Medicine, ’71, from Texas A&M University. He spent one year in mixed veterinary practice that included primarily cattle and horses in Texas before moving to Idaho to continue in private practice for eight more years.

In 1980, this individual joined the staff at the Idaho State Department of Agriculture as the chief of the Bureau of Animal Health. In 1988, he served as the president of the Western States Livestock Health Association. In 1990, he was named as the administrator of the Division of Animal Industries and State Veterinarian.

Our honoree has held numerous positions in organizations relating to animal health. He was a designated epidemiologist for Brucellosis, Tuberculosis and Pseudorabies. He also served as technical advisor to the Governor's Wildlife Brucellosis Task Force. He was a member of the National Cattlemen's Beef Association's Cattle Health and Well-being Committee and has served on the Bi-National Tuberculosis and Brucellosis Committee. He served on the Secretary's Advisory Subcommittee for the National Animal Identification System and chaired of the Greater Yellowstone Interagency Brucellosis Committee.

This individual’s contributions to USAHA are many. Foremost, he served as the 2001 president of the Unites States Animal Health Association and represented USAHA admirably as our nation confronted the concerns of the large FMD outbreak in the UK. This individual was called upon many times by USAHA leadership to chair Committees, which were facing serious animal health events. From 1992 to 1996, our recipient was called upon to chair the Committee on Tuberculosis, at a time when imported TB was a growing concern. Again in 2004, he was called upon to chair the Committee on Livestock Identification during a critical time in the evolution of a national animal identification system. This individual never said “no” and was always willing to take on the difficult challenge. He has also been a long-time member and contributor to the Committee on Brucellosis and the Committee on Wildlife Diseases. Our honoree was a participant of the 1997 and 2008 Long Range Planning Committees for USAHA. He has always brought a broad and insightful perspective to this organization, and done so with the
highest respect of his peers. As the old saying goes, “When he speaks, others listen.”

A large animal veterinarian for 35 years, our honoree served a short stint with the USDA in Texas, and worked in private practice in both Texas and Idaho. For more than two decades, he served with the Idaho Department of Agriculture, 13 of those as the state veterinarian, during which he wrangled with controversial disease issues, including addressing the brucellosis infection in bison and elk in the Greater Yellowstone Area. He also worked closely with the Border State Veterinarians and the cattle industries in Texas, New Mexico, Arizona and California, and with Mexican livestock health officials to control cattle tuberculosis and fever ticks in Mexico.

Our 2011 Medal of Distinction honoree retired December 31, 2009, as Texas’ state veterinarian and executive director of the Texas Animal Health Commission (TAHC), ending his nearly seven-year tenure with that state’s livestock and poultry health regulatory agency. He is a previous recipient of the National Assembly Award (2007) and the APHIS Administrator’s Award (2005).

This individual is now enjoying being semi-retired in Idaho, and with his lovely wife Martha, is finding time to share with their children and grandchildren.

I know you will agree that there are few individuals that have contributed more during their careers to USAHA than the man we are honoring tonight. Please join me in congratulating our 2011 USAHA Medal of Distinction recipient, Dr. Bob Hillman.
The recipient of this year’s National Assembly Award, was born into a farm family, where he was taught hard work, humility, honesty, fairness and respect for all individuals regardless of their background or circumstances. His first adventure with livestock was a dairy herd he established as part of his FFA project. He says this project was what piqued his desire to be involved in the livestock industry.

After graduation from high school and with the influence of an extension agent, he ventured into the University of Missouri-Columbia to pursue his love for the livestock industry. He obtained his Doctorate of Veterinary Medicine in 1959 and returned to southwest Missouri to provide veterinary service to livestock producers.

In 1971, he began his regulatory career in the State Meat Inspection program with the Missouri Department of Agriculture. In 1973, he was appointed Missouri State veterinarian and he immediately began focusing his career during this time was on brucellosis education. He held this position until 1982.

After leaving the Missouri Department of Agriculture, he became State Veterinarian and Director of the Arkansas Livestock and Poultry commission from 1983-1993. During his tenure in Arkansas, he developed numerous rules and regulations that are still effective today in Arkansas’s efforts to control livestock and poultry diseases and enhance marketability of livestock and poultry products. Under his leadership, Arkansas reduced its brucellosis infection. Due to his many outstanding contributions to the Arkansas Department of Agriculture, he was recognized by the Arkansas Farm Bureau, Arkansas Cattlemen’s Association and others as a true leader in Arkansas livestock and poultry disease control and eradication efforts.

Following his years in Arkansas, he held a variety of positions with the U.S. Department of Agriculture where he was in the Brucellosis Eradication Program on a federal level through his participation in the Mexican Heifer Spaying Program.

In 2002, he returned to his Missouri roots and was appointed Missouri State Veterinarian. Throughout his career, he has served on numerous committees and advisory boards on a state and national level. His background knowledge and experience is one of the strongest contributions to his outstanding leadership as Missouri State Veterinarian. He is currently serving the Missouri Department of Agriculture as Senior Advisor to the Director.

He was recognized by the Northeast Livestock Industries and the Missouri Cattlemen’s Association for his contributions to the livestock producers of Missouri. In 2007, he was honored with the Missouri
Veterinarian of the Year award by the Missouri Veterinary Medical Association. In 2010, he received the James A. Graham Award for Outstanding Service to Agriculture from the National Association of State Departments of Agriculture. Most recently, in the spring of 2011, he received the National Institute for Animal Agriculture’s Meritorious Service Award, adding to his many great accomplishments throughout the years.

I proudly introduce the recipient of the 2011 National Assembly Award, Dr. Taylor Woods.

Dr. Taylor Woods (l) with National Assembly past president Dr. Guy Hohenhaus.
II. B. USAHA/AAVLD Plenary Session

Evolving Food Systems for Global Food Security: Can Animal Production and Veterinary Infrastructure Keep Up?

Moderated by Dr. Terry McElwain, The Paul G. Allen School for Global Animal Health, Washington State University; Washington State University Animal Disease Diagnostic Laboratory
II. B. USAHA/AAVLD PLENARY SESSION

MAKING SAFE, AFFORDABLE AND ABUNDANT FOOD A GLOBAL REALITY

Ted McKinney
Elanco

Narrative: By 2050, we'll need 100% more food, and according to the U.N. FAO, 70% of it must come from efficiency-enhancing technologies. We must call a truce to the debate about the role of technology in the sustainable production of safe, affordable and abundant food if we are to protect the Three Rights: 1) Ensuring the human right of all people around the world to have access to affordable food; 2) Protecting all consumers' rights to spend their food budget on the widest variety of food choices; and 3) Creating a sustainable global food production system, which is environmentally right. Key point: The challenge of world hunger is complex and multifaceted. Allowing the entire food chain access to safe, efficiency-enhancing technologies is an essential component of a comprehensive solution to the challenge—both locally and globally. In addition, protecting the right to choose these technologies can make the dream of safe, affordable and abundant good a reality worldwide.

Speaker Biography: Ted McKinney is Director, Global Corporate Affairs, for Elanco Animal Health, a division of Eli Lilly and Company. Prior to Elanco, McKinney spent many years in a variety of Corporate Affairs positions at Dow AgroSciences, the last being as lead for global Food Chain & State Government Affairs. During his Dow AgroSciences tenure, he took leave in 2000 to serve as co-founder and Interim Executive Director for the Council for Biotechnology Information, a public information program sponsored by a consortium of companies involved with the development of crop biotechnology. He also led the company’s biotechnology public affairs efforts. He began his career in 1981 with Elanco Products Company, a division of Eli Lilly and Company, and spent time in several sales and marketing assignments. In 1986, he moved to Lilly, the parent company, with responsibility for media relations for the agriculture business and for environmental issues. In 1990, he joined DowElanco, a joint venture company formed by The Dow Chemical Company and Lilly. There, he established the Community Affairs and Industry Associations programs and later, added responsibilities for State Government and Public Affairs for the Midwestern States. He is co-chair of the 2006-12 National FFA Conventions Local Organizing Committee and a member of the Indiana State Fair Commission. He serves on the board of directors for the Washington, D.C.-based International Food Information Council (IFIC) and serves as Food Technology & Sustainability Committee Chair. He is also on the Lead Team for the International Federation of Animal Health (IFAH), and liaison to a number of food chain related associations. He also recently completed a year as Chair of the Indiana Agriculture Regulatory Structure Task Force,
commissioned by the Lt. Governor of the State of Indiana. McKinney is a 1990-1991 graduate of the Indiana Agricultural Leadership Program and a 1991-1992 graduate of the Stanley K. Lacey Indianapolis Executive Leadership Series. He was honored in 2004 by the National FFA Organization with an honorary American FFA Degree. In 1981, McKinney received a B.S. Degree in Agricultural Economics from Purdue University. There, he received the G.A. Ross Award as the outstanding senior male graduate. In 2002 he was named a Purdue Agriculture Distinguished Alumnus.
II. B. USAHA/AAVLD PLENARY SESSION

MARKETS, INFRASTRUCTURE AND ANIMAL PRODUCTION SYSTEMS

Tom Marsh
Washington State University

**Narrative:** World population has more than doubled since 1960, with continued growth projected in the future. Consequently, increased population and income growth have fueled a rising demand for protein in developed and developing countries. This includes protein from livestock. Global demand for livestock protein is here to stay in the foreseeable future. Among the developed countries, the U.S. is one of the largest consumers of livestock and meat products. Simply put, we like our meat. In contrast, in less developed countries, culture and economic circumstances can dictate demand for livestock protein. For instance, in eastern Africa, smallholder pastoralists are dependent upon milk from cattle. A preponderance of empirical evidence on the demand for food suggest that it would take major structural changes in economies and in cultures/traditions across the world to permanently shift preferences away from consumption of livestock products or to alter strongly formed consumption habits. A safe and secure livestock supply chain is critical to meet demand, now and in the future. An efficient, productive, and sustainable livestock sector is simply not feasible without adequate veterinarian infrastructure. Investment in infrastructure in the U.S. has enabled producers of livestock to successfully combat diseases, and as a result obtain loans, grow assets, retain value, and accumulate wealth. Except for isolated events (e.g., BSE) the U.S. has had access to international markets for exports. This is not so in other parts of the world. In East Africa, there are limits on resources for veterinarian infrastructure/services, surveillance, control of transboundary diseases, and response. As a result, smallholders can lose a majority of their calf crop to livestock diseases and they have limited if any access to international markets. Because livestock are their primary assets and the main source of wealth for the smallholder, these circumstance help perpetuate a poverty trap. In the current economic circumstances, it is understandably important to scrutinize federal or state budgets and to prioritize resource allocations. However, short term political decisions should not outweigh critical investment into livestock and human health infrastructure and services. These investments are necessary to combat livestock diseases, facilitate sustainable production systems, provide safer and more secure food, and maintain or improve household well-being.

**Speaker Biography:** Dr. Thomas L. Marsh is a Professor in the School of Economic Sciences at Washington State University, and holds affiliated appointments in the Paul Allen School for Global Animal Health and Department of Statistics at WSU. Dr. Marsh’s major areas of study are marketing and international trade, quantitative methods, and natural resource
II. B. USAHA/AAVLD PLENARY SESSION

economics. Specific areas of research include estimating the impact of public food safety information on consumer demand, as well as measuring welfare and trade impacts of livestock diseases (including BSE, FMD, and E. Coli) and policy responses. Dr. Marsh was raised on a cattle ranch near the Canadian border in Northeastern Montana, which continues to be operated in the family as a cow-calf and backgrounding operation. Dr. Marsh is a member of the Washington State Academy of Sciences, and also serves as Director of the IMPACT Center at Washington State University. He teaches Ph.D. courses in econometrics and an undergraduate course in management economics. He is an associate editor of the top economic field journal in agricultural, the American Journal of Agricultural Economics.
II. B. USAHA/AAVLDPLENARY SESSION

ROLE OF VETERINARIANS IN GLOBAL FOOD SECURITY

Ron DeHaven
American Veterinary Medical Association

**Narrative:** National and State veterinary services in the U.S. and elsewhere have a proud and distinguished history of animal disease exclusion, detection, control, and eradication. Animal production in the U.S. has advanced to its current global leadership role due, in no small part, to the partnership between federal, state, and industry animal health officials. By working collaboratively to promote and improve the health of our livestock and poultry populations, these groups are able to produce the safest, most abundant food supply in the world. Global demand for animal protein has been increasing exponentially for several years and that demand is expected to accelerate as the world population continues to grow and as the economies of many developing countries continue to improve. Terrestrial and aquatic production systems are becoming larger and more integrated, making the potential impact of disease introduction much greater. The everyday movement of animals and animal products in a global marketplace has exaggerated the potential for disease spread, with the incubation period of many emerging and re-emerging disease shorter than the time it takes to move people and animals from one corner of the globe to another. Ultimately we have a growing dependence on animal protein at the same time that the risks to systems that produce that protein are at an all-time high. The systems designed to protect that animal production infrastructure reside largely in national veterinary services. At a time when national and state (public) veterinary services need to be stronger and more effective than ever, many countries are actually experiencing an alarming decline in the investment in national veterinary services. Similarly, private sector veterinary practice in developed countries has been impacted by the consolidation of animal operations, resulting in fewer veterinarians overseeing larger populations of animals, leaving many large rural areas totally without the benefit of veterinary professionals. This has not only impacted the delivery of necessary veterinary medical care to small producer operations, but also reduced the trained workforce necessary for early detection and rapid, effective response to a disease outbreak. Driven in large part by the global economic downturn, politicians and government officials are looking increasingly at cutting funding to animal health infrastructure within their national and state veterinary services as a source of savings. The irony is that the relatively small savings that can be realized by such funding cuts puts at risk huge production system as well as economically important domestic and international markets.

**Speaker Biography:** Dr. Ron DeHaven is the Chief Executive Officer and Executive Vice President of the American Veterinary Medical Association
II. B. USAHA/AAVLD PLENARY SESSION

Association (AVMA), where he serves over 81,500 members of the AVMA as they work to meet the challenges of improving both human and animal health in the 21st century. Dr. DeHaven has more than two decades of experience with the United States Department of Agriculture’s (USDA) Animal Plant Health Inspection Service (APHIS) and gained national prominence in 2003 and 2004 when bovine spongiform encephalopathy and avian influenza were making headlines. Dr. DeHaven received the President's Rank Awards (Meritorious and Distinguished) for his leadership. He also received the Secretary’s Honor Award twice. The AVMA honored Dr. DeHaven's contributions to the veterinary profession with the Meritorious Service Award in 2004. He also received the Roswell Award from the Scientists Center for Animal Welfare and an honorary Doctor of Science degree from Purdue University in 2005. Dr. DeHaven has been the CEO of AVMA since August 2007. As APHIS administrator from 2004 to 2007, Dr. DeHaven was ultimately responsible for the protection of U.S. agriculture and natural resources from exotic pests and diseases, administering the Animal Welfare Act, and carrying out wildlife damage management activities. Prior to starting work at APHIS, Dr. DeHaven was commissioned into the U.S. Army Veterinary Corps and served in the U.S. Army Reserves and National Guard. Dr. DeHaven obtained his doctor of veterinary medicine degree from Purdue University in 1975 and a master's degree in business administration from Millsaps College in 1989.
II. B. USAHA/AAVLD PLENARY SESSION

VETERINARY DIAGNOSTIC LABORATORIES ROLE IN FOOD SECURITY

Alfonso Torres
College of Veterinary Medicine, Cornell University

**Narrative:** It is well recognized that animal disease outbreaks, particularly those that are highly contagious or of foreign or emerging nature, often cause serious local to global negative socioeconomic consequences. A key element in the prevention and control of such disease outbreaks is the ability to provide a prompt and accurate diagnosis of the event. Veterinary diagnostic laboratories, whether federal, state, or private, provide a critical front line defense for the prevention and control of these potentially catastrophic animal or zoonotic disease events. We should be proud of the fact that the discipline of veterinary diagnostics has reached a high scientific level, comparable to (and in cases better than) that used for the diagnosis of transmissible diseases in humans. The same can be said for the state of veterinary diagnostics in areas of anatomical and clinical pathology for non-infectious conditions. The development of veterinary and public health diagnostic laboratory networks in the United States has been a great accomplishment serving as a model for the rest of the world, particularly for the development of regional laboratories in developing nations. The recent outbreaks of highly pathogenic avian influenza with their potential role in generating a human influenza pandemic eventually demonstrated to the world the need to invest in developing a robust network of influenza diagnostic laboratories all over the globe. Unfortunately, the sustainability of those laboratories is now in jeopardy as the “influenza bubble” has passed, and unfortunately we continuing to face a national and global crisis in the provision of vital veterinary diagnostic services for many diseases at a time when the demands for veterinary diagnostic services is increasing due to: (a) increasing demands on productivity of our farms to feed an ever increasing global population that requires more and more protein of animal origin; (b) increased risk of introduction of transboundary animal diseases due to greater than before travel, trade and geopolitical instabilities; (c) continuous threat of bioterrorism; and (d) the continuing possibility of the emergence of new or altered infectious diseases. To compound those challenges, the affordable delivery of quality veterinary medical and diagnostic services is being seriously challenged due to the current national and global economic crisis.

**Speaker Biography:** A native of Bogotá, Colombia, Dr. Torres holds a doctor of veterinary medicine degree from the National University of Colombia. He also has earned a Master of Science degree in veterinary pathology from the University of Nebraska, and a doctorate in medical microbiology, specializing in virology, from the University of Nebraska.
II. B. USAHA/AAVLD PLENARY SESSION

Medical Center. Dr. Alfonso Torres served as Deputy Administrator of USDA-APHIS-Veterinary Services from 1999 to 2002. In that capacity he was also the United States’ Chief Veterinary Officer and the US delegate to the World Organization for Animal Health - OIE. From 1996 to 1999, Dr. Torres was the Director of the Plum Island Animal Disease Center (PIADC) on Plum Island, NY. While at PIADC, Dr. Torres also served as chief of USDA’s Foreign Animal Disease Diagnostic Laboratory (FADDL) from 1994 to 1996. Prior to serving at the USDA, he worked for SmithKline Beecham Animal Health from 1987 until 1991. Dr. Torres served as an Associate Professor of virology at Cornell University’s College of Veterinary Medicine, from 1983 until 1987. He held a similar position at the University of Nebraska from 1978 through 1983. Dr. Torres returned to Cornell in 2002 as professor and Associate Dean for Public Policy. He coordinates all government relations and international programs for the College of Veterinary Medicine and supervises the College biosafety program. He teaches the Foreign and Emerging Animal Disease Course and coordinates the USDA-funded “Smith-Kilborne Foreign Animal Disease Program” that brings every year one veterinary student from all the US Colleges to Cornell and to PIADC, Plum Island. He also coordinates the USDA-funded International Course on Transboundary Animal Diseases delivered at PIADC, Plum Island, for veterinarians from many parts of the world. Dr. Torres interests are in the area of transboundary and emerging animal diseases, global animal health, bioterrorism, biosecurity and animal health public policy. Contact information: Alfonso Torres, DVM, MS, PhD. Professor & Associate Dean for Public Policy College of Veterinary Medicine Cornell University S2-005C Schurman Hall Ithaca, NY 14853-6401 Tel.: (607) 253-3480 Fax: (607) 253-3701 e-mail: at97@cornell.edu.
II. B. USAHA/AAVLD PLENARY SESSION

ERADICATION OF RINDERPEST AS A WORKING EXAMPLE OF PROTECTING FOOD SECURITY

William Taylor
Independent Consultant, Littlehampton, UK

**Narrative:** In the 17th and 18th centuries rinderpest spread unchecked across Europe causing the death of millions of cattle and thereby earned its fearsome reputation. Eventually, legislative measures, the establishment of veterinary schools and state veterinary services brought the disease under control and by the end of the 19th century rinderpest had been eradicated from Europe. Further progress in control awaited the end of the Second World War when China rapidly eradicated rinderpest using an intensified strategy that embraced newly available, large scale vaccination. Around 1960 an international appreciation of the need to eradicate rinderpest as a food security issue began to form. Starting in south Asia, Food and Agriculture Organization (FAO) became involved in introducing vaccine technology in Cambodia and Thailand and eradication campaigns in these, and neighbouring countries, were quickly successful. The international community was also looking at Africa in the realisation that considerable external financial assistance would be required to achieve a similar objective. This came, firstly through United States Agency International Development (USAID), later through FAO and finally from the EU. After three decades of mass vaccination the incidence of rinderpest in Africa finally fell to zero in 2001. In the 20th century the control of rinderpest became increasingly reliant on improvements in vaccine production technology which ultimately yielded egg, goat, rabbit and cell culture attenuated strains and finally, a thermostable variant of the latter. Applied research demonstrated the absence of reservoir hosts in wildlife and showed the presence of three lineages of the virus with variable R0 values. Rinderpest diagnostics moved on from the simple agar gel immunodiffusion test and virus isolation procedures to the RT-PCR for virus confirmation and the immunocapture ELISA for large scale serum testing. In 1954 India embarked on her national eradication campaign relying on mass vaccination but required 40 years and a major strategy review to complete the task. Nevertheless India saw her last case of rinderpest in 1995 and from then to the last case globally took a mere six years. This demonstrated the need for management practices to keep pace with strategy concepts, which were proceeding apace, with the OIE developing a pathway approach dependent on a zero incidence of disease, an end to vaccination and a subsequent evidence-based clinical and serological assessment. Throughout, FAO provided the necessary elements of international coordination and cohesiveness. Globally rinderpest was eradicated in 2001 and over the next decade all recently infected countries provided evidence of this achievement at a technical level.
**Speaker Biography:** Dr. Taylor graduated BVM&S from Edinburgh University in 1962 and BSc in 1963. In 1972 he was awarded his PhD from the Australian National University, Canberra. From 1963 to 1968 he worked at the East African Veterinary Research Organisation at Muguga, Kenya where he studied the pathogenesis of rinderpest virus in cattle, the epidemiology of the virus in game animals and the isolation of field strains in cell culture: he also initiated the manufacture of Plowright’s famous attenuated cell culture rinderpest vaccine in East Africa. From 1973 to 1978 he worked at the National Veterinary Research Institute at Vom, in northern Nigeria where he established field evidence that Peste des Petits Ruminants was a new morbillivirus and not, as hitherto proposed, a rinderpest mutant. He also worked extensively on Bluetongue and African Horse Sickness showing each was an endemic but sub-clinical condition of local cattle and horses respectively but with the potential to cause severe disease in imported stock. From 1979 to 1985 Dr Taylor worked at the IAH, Pirbright, UK on bluetongue in the Middle East and on rinderpest in the Gulf States. From 1986 to 1988 he worked in Nairobi with the Pan African Rinderpest Campaign, initially as FAO epidemiologist, later as an EU Technical Advisor. In 1989 he moved to New Delhi, India as the EU Technical Advisor to the Government of India’s National Project for Rinderpest Eradication where he designed a strategy that took India from a rinderpest infected to a rinderpest-free country. In 1997 he assisted FAO in halting a rinderpest epidemic in Tanzania and for the next seven years, regularly visited Pakistan as an FAO consultant, assisting that country to qualify as rinderpest-free. In 2010 he chaired a Joint FAO-OIE Committee to evaluate the soundness of a global declaration of rinderpest eradication.
II. C. USAHA Joint Scientific Papers, Posters and Abstracts
AN 11-GENE MULTIPLEX PCR TO DETECT THE SEVEN MAJOR SHIGA TOXIN-PRODUCING ESCHERICHIA COLI BASED ON GENES THAT CODE FOR MAJOR VIRULENCE FACTORS AND SEROGROUP-SPECIFIC O-ANTIGENS

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Narrative: Cattle harbor Shiga toxin-producing E. coli (STEC) in the gastrointestinal tract, particularly in the hindgut, and serve as a major reservoir. The STEC is shed in the feces, which serves as the major source of food contamination and human infections. Among STEC, the O157 serogroup has long been recognized as a major foodborne pathogen. Recently, non-O157 serogroups, belonging to six O groups, O26, O111, O103, O121, O45, and O145, have been recognized as a growing public health concern. According to CDC, all STEC account for approximately 175,000 illnesses annually, and of those O157 and non-O157 are responsible for 36% and 64% of total STEC infections, respectively. The traditional cultural method to identify E. coli O157 relies on the use of immunomagnetic separation beads, plating on selective medium, and agglutination with serogroup-specific antisera for confirmation. Such methods for isolation of non-O157 STEC have not been developed. Moreover, the beads are not available for all non-O157 STEC. Regardless, culture-based methods are laborious and are not adaptable for high-throughput settings.

We have previously developed a 6-gene multiplex PCR to detect four major virulence genes, stx 1, stx 2, eae and hly A, and the serotype-specific O157 (rfb E) and H7 (fli C) antigens. Monday and colleagues have developed a PCR assay to detect O157 and five of the six major non-O157 serogroups from culture. In this study, we developed an 11-gene multiplex PCR assay to detect the four virulence genes as well as the O157 and the six major non-O157 serogroups. Molecular target for the four virulence genes and the O157 antigen were the same in the six-gene PCR. The wzx and wbq E-F genes were used for six non-O157 serogroup designs. The amplicon sizes of the 11-gene multiplex PCR are 890, 740, 655, 587, 523, 477, 417, 375, 296, 230, and 199 bp for O45, O103, stx 1, O121, O145, stx 2, O26, eae, O157, O111, and hly A respectively. The bands were separated well on a 1.2 % agarose gel and on a Qiagen QIAxcel automated electrophoresis system. The test was validated with 138 E. coli strains consisting of 18 strains of O26, 3 of O45, 23 of O103, 28 of O111, 9 of O121, 13 of O145, and 44 of O157. Sensitivity test for pure culture was 10⁴ CFU/ml, and for spiked cattle feces was 10⁵ CFU/ml. The test was also validated with a number of field cattle fecal samples.
AN UNUSUAL GRAM-STAINING OF AN ARCANOBACTERICUM PYOGENES ISOLATED FROM A MILK SAMPLE: A CASE REPORT

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**Narrative:** An unusual *Arcanobacterium pyogenes* isolate was recovered from a bulk tank milk sample submitted to Animal Diagnostic Laboratory at the Pennsylvania State University. This organism produced small grey colonies with small zones of beta-hemolysis on blood agar after 24 hours of incubation at 37°C. The organism was coagulase-negative as determined by direct tube coagulase test. Gram staining of a pure culture of the organism yielded a Gram-positive organism with abnormal microscopic cell morphology with a filamentous structure. An automated biochemical testing (Sensititre®, Trek Diagnostic Systems, Inc., Cleveland, Ohio, USA) identified the organism as *A. pyogenes*. Partial nucleic acid sequencing of bacterial 16S rRNA gene confirmed the organism as *A. pyogenes* with 100% homology at the nucleotide level. Repeated subculturing of the organism on blood agar yielded a cell morphology which is typical of *A. pyogenes* on Gram-stained smears. However, when the organism grew in the presence of penicillin in the laboratory the cell morphology was restored back to its initial filamentous morphology. This suggests that this unusual gram-stain finding of *A. pyogenes* is perhaps due to defective cell division subsequent to antibiotic therapy.
Narrative: Antimicrobial resistance has become an increasingly important global public health issue. This study was conducted to determine whether antimicrobial susceptibility patterns of major mastitis pathogens isolated from milk samples of dairy cows have changed over time. Samples included 1,136 bacterial isolates representing *Escherichia coli*, *Klebsiella species*, *Serratia marcescens*, *Staphylococcus aureus* subspecies aureus, coagulase-negative *Staph. species*, *Streptococcus dysgalactiae* subspecies dysgalactiae, *Strep. agalactiae* and *Strep. uberis* obtained from milk samples submitted to the Animal Diagnostic Laboratory for diagnostic bacteriologic testing from January 2006 to December 2010. Antimicrobial susceptibility testing was performed with the Sensititre® automated system using the mastitis plate format. The antibacterial agents included in the selected plate format were penicillin, ampicillin, cephalothin, ceftiofur, penicillin + novobiocin, erythromycin, pirlimycin, tetracycline, and sulfadimethoxine. Logistic regression was used to determine whether percentages of isolates resistant to various antimicrobial agents changed over time. Overall, the results did not indicate increased antimicrobial resistance among mastitis pathogens isolated from milk samples from dairy cows during the study period.
COMPARISON OF VIRUS ISOLATION AND REAL-TIME RT-PCR FOR DETECTION OF AVIAN INFLUENZA VIRUS AND NEWCASTLE DISEASE VIRUS IN CLOACAL SWABS OF POULTRY AND DUCKS

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Narrative: Cloacal (CL) swabs from poultry and ducks are known to contain substances that are inhibitory to polymerase chain reaction (PCR) testing. Fecal and dietary inhibitors can reduce the efficiency of amplification or completely prevent amplification of the target leading to weak positive or false negative PCR results. A NAHLN Methods Comparison Study was conducted to compare the limit of detection (LOD) for virus isolation (VI) and real-time RTPCR (rRT-PCR) for RNA extracted with magnetic bead technology for CL swabs from poultry and domestic ducks (DD) to determine if CL swabs could be an approved sample matrix for rRT-PCR testing. Ten-fold serial dilutions of A/turkey/Ontario/18-2/2000 H7N1 and APMV-1 B1 viruses were prepared in chicken (CK) and DD CL and CK tracheal (TR) supernate and tested by VI and rRT-PCR. Five replications of each dilution series were conducted each day, and the testing was performed on three consecutive days. The LOD, amount of analyte in which there is a 95% probability of classifying the sample as positive, was determined for each species, sample type and virus and was expressed as an estimated log10 EID50. The EID50 for CK TR swabs with AI for VI was determined to be 1.9, and the EID50 for rRT-PCR was determined to be 1.0. For TR swabs with APMV-1 the EID50 for VI was determined to be 0.8-2.0, and the estimate for rRT-PCR was 1.5. For CL swabs the EID50 for CK swabs with AI for VI was 1.7, and the estimate for rRT-PCR was 1.8. For APMV-1, the EID50 for CK CL swabs with VI was 3.2, and the estimate for rRT-PCR was 0.8-2.0. For DD CL swabs spiked with AI the EID50 for VI was 1.5, and the estimate for rRT-PCR was 1.2-2.2. Using TR swabs spiked with AI and APMV-1 the rRT-PCR tests were estimated to be more sensitive by approximately 0.9 to 0.5 EID50, respectively. Using CK CL swabs with AI, VI tests were estimated to be more sensitive by 0.1 EID50 while PCR was estimated to be more sensitive by 2.4 to 1.2 EID50 for CK CL swabs with APMV-1. Using DD CL swabs, VI was estimated to be more sensitive than PCR by 0.7 EID50. The estimated difference is <1 0 EID50 for both CK and DD CL swabs samples with AI and APMV-1, which is considered to be comparable to VI. Cloacal specimens will be an approved sample matrix for rRT-PCR when RNA is extracted with approved magnetic bead RNA extraction procedures.
DETECTION OF SHIGA TOXIN-PRODUCING *ESCHERICHIA COLI* SEROGROUPS O26, O45, O103, O111, O121, AND O145 BY ENZYME LINKED IMMUNOSORBANT ASSAY

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**Narrative:** Shiga toxin producing *Escherichia coli* (STEC) serogroups O26, O45, O103, O111, O121, O145 have been identified as the “top six” non-O157 STEC by the U.S. Centers for Disease Control and Prevention as causative agents of diseases with high morbidity and mortality. While there are methods available for identification of O157, no analogous detection procedures are yet available for rapid detection of these serogroups other than by conventional serotyping and PCR assays. The objective was to develop an Enzyme Linked ImmunoSorbent Assay (ELISA) to detect the six STEC O groups, O26, O45, O103, O111, O121, O145 using polyclonal antibodies specific for each O group. Rapid and easy detection and identification methods are crucial for determining the prevalence of the STEC O groups in food samples for controlling the pathogens to improve food safety and public health. Polyclonal antibodies for each of these O groups were kindly provided by SDIX. Sandwich ELISAs were developed for each O group by coating 96-well plates with monoclonal anti-lipid A antibodies. The antigen, heat killed *E. coli* strains at different concentrations, were allowed to bind to lipid A antibodies for 1 h at 37°C. The bound complexes were washed with PBS. Antibodies against each of these O groups were added and the reaction was continued for another 1 h at 37°C. Antirabbit IgG linked to horse radish peroxidase was added to bind to lipid-antigen-antibody complex. The color reaction was developed using TMB (3,3',5,5'-tetramethyl benzidine) solution and the plates were read at 450 nm. The ELISAs developed for all six O groups could detect the reference strains and test clinical samples belonging to the STEC O group. By spiking ground beef samples with different concentrations of known STEC strains belonging to one of the six serogroups, the assays could detect 20 CFU of STEC following enrichment for 16 h at 37°C in tryptic soy broth. The ELISAs for each O group were highly specific and did not react positively with most of the 173 different known *E. coli* O groups or other Enterobacteriaceae. Current methods, for the detection and identification of STEC O groups, that have been adopted by CDC and FSIS are time consuming and require several days to complete. The ELISAs described here are rapid, sensitive, specific and easy to use that ideally lend themselves to application by the food industry for rapid detection of STEC O groups.
DIFFERENTIAL SHIGA TOXIN PRODUCTION AMONG SHIGA TOXIN-PRODUCING ESCHERICHIA COLI

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**Narrative:** Shiga toxins produced by *Escherichia coli* are responsible for causing diarrhea, hemorrhagic colitis and hemolytic uremic syndrome in humans. The shiga toxin genes (stx1 and stx2) are carried by prophages that are integrated into *E. coli* genomes. The toxins are expressed and released under stress. Six O groups of shiga toxin-producing *E. coli* (STEC), in addition to O157, have been considered important for causing diseases in humans. The objective was to examine if there are differential toxin expressions among the clinical isolates carrying stx genes belonging to different STEC O groups for defining the degree of pathogenicity between the O groups. An ELISA assay was developed by coating 96-well plates with globotriosyl ceramide which is the receptor of shiga toxin. Clinical isolates belonging to O groups O26, O45, O111, O121, O145 and O157 were inoculated into fresh media and induced by ciprofloxacin (100 ng/mL) or mitomycin C (100 ng/mL) and further incubated at 37°C for 6 h. The cell supernatant was used for the assay. Monoclonal antibodies to Stx1 and Stx2 were used to bind to the receptor-toxin complex. Anti-mouse IgG attached to horseradish peroxidase was added to the complex followed by color reaction that was developed and quantitated by reading at 450 nm. There were differential expressions of shiga toxins among the clinical isolates belonging to different STEC O groups. While some of the strains needed induction for Stx production, others produced the toxin without induction. Further experiments are being conducted to compare the expression among the STEC isolates. It is concluded that the expression of shiga toxins vary considerably and sheer presence of shiga toxin genes is not an indicator of pathogenicity of the STEC. This work provides a comparative analysis of association of shiga-toxin gene and its ability to produce toxins among STEC O groups. The ELISA method developed for shiga toxin detection is potentially applicable to screen for STEC strains associated with diverse food materials.
GENOTYPIC CHARACTERIZATION OF SELECTED RESISTANT
MANNHEIMIA HAEMOLYTICA AND PASTEURELLA MULTOCIDA
ASSOCIATED WITH BOVINE RESPIRATORY DISEASE FROM THE
PFIZER ANIMAL HEALTH SUSCEPTIBILITY SURVEILLANCE PROGRAM
1999-2007

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Narrative: The Pfizer Animal Health Susceptibility Surveillance Program (PAHSSP) for bovine respiratory disease (BRD) consists of bacterial isolates from veterinary diagnostic laboratories since 1998 to the present originating from 44 states and 7 provinces in the United States and Canada. The purpose of this study was to examine the clonal diversity of macrolide-resistant strains of Mannheimia haemolytica and Pasteurella multocida found in the PAHSSP. A subset of BRD-associated M. haemolytica and P. multocida PAHSSP isolates from 1999 to 2007 (N=230) were examined by pulsed-field gel electrophoresis. For each organism, a matched set of tilmicosinR/tulathromycinR/tetracyclineR (TILR/TULR/TETR), TILR/TULS/TETR and TILS/TULS/TETS isolates (if available) from the same year and state/province of the program was examined. Decreased tetracycline susceptibility or tetracycline resistance was consistently observed with macrolide resistance in the PAHSSP collection. The TILS/TULR/TETR phenotype was not observed. M. haemolytica (N=79) clustered at 91% similarity into 5 clonal groups of 4-7 members each. P. multocida (N=151) clustered at 91% similarity into a major clonal group of 70 members and a minor, 15 member clonal group. M. haemolytica and P. multocida clonal groups consisted of TILR/TULR/TETR, TILR/TULS/TETR and TILS/TULS/TETS isolates and occurred in multiple states/provinces over multiple years. The erm(42) gene occurred in TILR/TULS/TETR isolates; erm(42) and msr(E)-mph(E) genes occurred in TILR/TULR/TETR isolates. BRD-associated, macrolide-tetracycline resistant Mannhemia haemolytica and Pasteurella multocida from the PAHSSP representing various regions in North America over nine years were distributed among multiple clonal groups with varied macrolide susceptibility. In the isolates examined from North America, the existence of two major Pasteurella multocida clonal groups across time and region suggest broad distribution of a limited number of macrolide resistant clonal strains.
II. C. USAHA JOINT SCIENTIFIC PAPERS, POSTERS AND ABSTRACTS

GROSS AND HISTOPATHOLOGIC CHARACTERIZATION OF CAPRINE MELIOIDOSIS AFTER AEROSOL CHALLENGE WITH BURKHOLDERIA PSEUDOMALLEI

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Narrative: Burkholderia pseudomallei is the causative agent of melioidosis, which is endemic to Southeast Asia and northern Australia. While the disease was first described almost 100 years ago (1), it still remains a serious emerging infectious disease. Melioidosis is currently the third leading infectious cause of death in northeast Thailand (2). B. pseudomallei has also been designated a Category B Select Agent by the United States Centers for Disease Control and Prevention because of its potential use in bioterrorism. The research on the pathogenesis of melioidosis has primarily used mouse models. However, mice are not naturally infected with B. pseudomallei, nor do murine models readily allow for serial assessment of vital parameters, clinical pathology, and immunologic events because of their small size and limited blood volume, limiting the evaluation of disease progression on a human-relevant scale. Twelve goats were infected intratracheally by an aerosol of 105 CFU B. pseudomallei. Goats were sacrificed on days 2, 7, 14, and 21 post-infection (PI). Bronchointerstitial pneumonia was grossly apparent by day 7 PI and systemic dissemination was evident in multiple organs namely spleen, kidneys, adrenal glands, and testicles as early as day 14-16 PI. Histopathology revealed that the early lesions of mucopurulent bronchopneumonia soon progressed to a more severe fibrinopurulent and histiocytic to proliferative bronchointerstitial pneumonia with eventual formation of characteristic melioidosis pyogranulomas. Lesions spread within the lungs along interlobular septa and subpleural stroma where leukocytoclastic vasculitis appears to be the central step in hematogenously disseminating the organism to extra-pulmonary tissues.

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IDENTIFICATION OF *BRUCELLA CANIS* IN CANINE BLOOD
BY A DUPLEX REAL-TIME PCR ASSAY

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**Narrative:** *Brucella canis* is the primary causal agent of canine brucellosis, a contagious disease with venereal and oral modes of transmission that produces late gestation abortions in females and epididymitis and prostatitis in males. The transmissibility of the canine brucellosis is related to enhanced environmental persistence of *B. canis* compared to other *Brucella* species. Although mortality is relatively low, the infection in males often leads to sterility. Other *Brucella* species, *abortus, melitensis* and *suis* can occasionally cause brucellosis in dogs. We have developed a duplex real-time PCR assay that can specifically detect *B. canis* or any other *Brucella* species. The assay was designed to target the spacer region between the 16S and 23S rRNA genes that is common to all *Brucella* species, and a nearly 1 kb deletion that occurs only in *B. canis* strains. Primers for *B. canis*-specific target were designed flanking the nearly 1 kb deletion, and the probe was designed on the deletion junction so that it should generate signal specific for *B. canis* strains. The performance of the assay was tested with 676 dog blood samples and compared with the traditional cultural method. One milliliter of the whole blood was added to 5 ml of BHI broth, and was frozen at -20C for overnight. The mixture was subsequently incubated at 37C for 24 h and used for DNA extraction for PCR assay and for streaking on a blood agar plate for isolation. Culture method identified 26 blood samples positive for *B. canis*. In addition to the 26 culture positives, the duplex PCR assay identified 13 more samples positive for *B. canis*. The amplicons of selected positives were confirmed by DNA sequencing. The analytical sensitivity of the assay was determined using blood samples inoculated with serially diluted (ten-fold dilutions) pure culture of *B. canis*. Blood samples were mixed with serially diluted *B. canis* culture and allowed to set for 15 min, then added to 5 ml BHI broth. The tubes were incubated at 37C for 24 and 48 h after freezing overnight at -20C. Selected dilutions were plated on blood agar plates to determine bacterial cell concentrations. The experiment was repeated three times using three different *B. canis* strains. After 24 h enrichment in BHI, the minimum detection limit was 14 CFU/ml. At 48 h post enrichment, we were able to detect 1.4 cells/ml. Culture method was only evaluated at 48 h post enrichment. The PCR assay had the same analytical sensitivity as culture method in one replication, and was more sensitive than the culture method in
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two other replications. The duplex real time assay may provide a reliable and rapid method to diagnose *B. canis* infections in dogs.
IDENTIFICATION OF LYMPHOPROLIFERATIVE DISEASE VIRUS IN WILD TURKEYS (MELEAGRIS GALLOPAVO) IN THE SOUTHEASTERN UNITED STATES

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Narrative: Viral-associated lymphoproliferative neoplasia in domestic poultry is caused by infection with a herpesvirus or three species of retroviruses. Previously, retroviral neoplasms reported in wild upland game birds in the United States of America have typically been associated with reticuloendotheliosis virus infection. Since 2009, lymphoproliferative disease virus (LPDV), a previously exotic virus to the United States, has been identified in six wild turkeys (Meleagris gallopavo) from two southeastern states, West Virginia (n=5) and Arkansas (n=1). All infected turkeys were found dead or in moribund condition by state wildlife biologists and subsequently submitted to the Southeastern Cooperative Wildlife Disease Study for diagnostic examination. Lymphoproliferative neoplasms were identified in all six turkeys in various visceral organs, including intestines, liver, kidneys, spleen, pancreas, lungs, adrenal glands, skeletal muscle, esophagus, heart, and air sacs. Using PCR targeting a portion of the gag gene, proviral sequences of LPDV were detected in samples of spleen, lung, heart, and/or liver from each turkey. Additionally, isolation of LPDV from these tissues was attempted by inoculating Pekin duck embryo (PDE) fibroblasts with clarified supernatant. After serial passages, nucleic acid was extracted from cell culture media and gag sequences were amplified by RT-PCR and not standard PCR, indicating the presence of live virus and the apparent in vitro replication of LPDV in PDE cells. Comparative alignment of the partial sequences of the gag gene from the Arkansas and two of the West Virginia isolates demonstrated a 92-94% and a 91-94% shared identity at the nucleotide and amino acid level, respectively. Additionally, comparison of the three North American isolates to the Israeli strain of LPDV identified a 85-86% nucleotide and a 85-87% amino acid identity in their gag sequences. These preliminary phylogenetic analyses of the partial gag sequences of the three North American LPDV isolates identified a monophyletic clade with Old World LPDV, distinct from other avian retroviruses. The cases reported herein are novel as they represent the first reports of LPDV infection in wild turkeys and the first identification of LPDV in North America.
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IDEXX BOVINE PREGNANCY TEST - A NEW TOOL FOR ACCURATE AND EARLY PREGNANCY DIAGNOSIS IN CATTLE

Katherine Velek, Shona Michaud, Meghan Hart, Valerie Leathers, Christoph Egli

IDEXX

Narrative: Accurate and timely detection of pregnancy in dairy cows is an essential component of today’s reproductive management programs. Veterinarians and farmers use early detection of non-pregnant (open) cows to enable faster rebreeding and shorten the calving interval, thereby maximizing milk production and revenue for the farm. IDEXX Laboratories, Inc. has developed an ELISA for the accurate detection of pregnancy as early as 28 days post breeding, providing veterinarians and dairy farmers with another tool for the early identification of open cows. The IDEXX Bovine Pregnancy Test detects the presence of early pregnancy-associated glycoproteins (PAGs) in bovine serum or EDTA plasma as a marker for pregnancy in cows. This study was conducted to evaluate the sensitivity and specificity of the IDEXX Bovine Pregnancy Test in dairy and beef cows and heifers, starting at 28 days after insemination and/or 60 days after calving. Serum and EDTA plasma samples were obtained from multiple sites in the US as well as Beijing, China. Trans-rectal ultrasound was also performed at day 28 or later to confirm the pregnancy status of bred cows. A total of 1181 serum samples and 1214 EDTA plasma samples were tested on the IDEXX Bovine Pregnancy Test following the package insert protocol. In this evaluation, the sensitivity of the IDEXX Bovine Pregnancy Test was greater than 99% when testing either serum or plasma taken from pregnant animals at least 28 days after insemination. Specificity was 93.8% for serum and 95.1% for plasma samples taken from heifers or from cows that were confirmed open by ultrasound after artificial insemination. Additional analysis of the data shows that after calving, the IDEXX ELISA detects a rapid decline in PAGs, and by 50 days after calving the assay values returned to baseline. Specificity was 100% for serum (n=227) or plasma (n=205) samples taken 50-200 days postcalving. This evaluation of the IDEXX Bovine Pregnancy Test indicates that the test can be a useful adjunct to existing reproductive management programs. It offers a reliable method to distinguish between pregnant and open animals at 28 days after breeding, and throughout the course of pregnancy. As with any diagnostic test, the IDEXX Bovine Pregnancy Test should be used under the guidance of a veterinarian as part of the farm’s overall health and reproductive management program.
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ISOLATION AND MOLECULAR CHARACTERIZATION OF TROUT INFECTIOUS PANCREATIC NECROSIS VIRUS (IPNV) IN PENNSYLVANIA AQUACULTURE

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**Narrative:** Infectious pancreatic necrosis (IPN) is an infectious viral disease that affects young fish of Salmonid species held under intensive rearing conditions. The disease most characteristically occurs in rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), Atlantic salmon (*Salmo salar*) and several Pacific salmon species (*Oncorhynchus spp.*). In Pennsylvania, an aquaculture surveillance program has been started in late 1990s and conducted more extensively in recent years for surveillance and diagnostic tests of trout IPN virus (IPNV) at the Pennsylvania State Animal Diagnostic Laboratory (ADL). From May 2008 to the present time, a total number of 1,555 samples were submitted for testing IPNV (also other fish viruses) at ADL. IPNV was identified in 122 samples tested by virus isolation in fish cell cultures using the chinook salmon embryo (CHSE) cell line and/or the fathead minnow (FHM) cell line. Viral cytopathic effects (CPE) usually occurred at the first or second cell passages if a test fish was IPNV infected. Immunoblot assay using monoclonal antibodies specific to IPNV was used to confirm IPNV from the CPE positive cell culture materials. The 122 IPNV isolates were mostly identified from rainbow trout and also a variety of other trout species. About 15% of these IPNV isolates, which represent different trout species, seasonal patterns and geographic locations, are currently selected for further molecular characterization of the IPNV field strains. Detail results of IPNV surveillance tests during the last three year period and molecular characterization studies on selected IPNV isolates will be presented and discussed.
II. C. USAHA JOINT SCIENTIFIC PAPERS, POSTERS AND ABSTRACTS

ISOLATION OF A CLOSTRIDIUM PERFRINGENS TYPE D ISOLATE PRODUCING B2 TOXIN AND ENTEROTOXIN FROM A CALF

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**Narrative:** Clostridium perfringens type D isolates cause natural enterotoxemia in sheep, goats, and occasionally cattle. *C. perfringens* Type D isolates produce two major toxins: α-toxin and ε-toxin. In addition to the major two toxins, some type D organisms isolated from sheep also make β2 toxin or enterotoxin, or both. Here, we report isolation of a *Clostridium perfringens* from a calf that apparently died from enterotoxemia. The calf was 10 days-old and from a 151-head Holstein cattle herd. The herd lost 5 calves during a two week period. All animals died of sudden death. Hemorrhagic small intestine was a common finding for all animals at necropsy. Genotyping indicated that the isolate is a type D *Clostridium perfringens* producing both β2 toxin and enterotoxin. To our knowledge, *Clostridium perfringens* type D isolate that produces both toxins in cattle has not been reported previously.
META-ANALYSIS ON 15 FIELD STUDIES COMPARING THE PERFORMANCE OF THE SKIN TEST WITH THE GAMMA-INTERFERON TEST (BOVIGAM®) FOR THE DETECTION OF BOVINE TUBERCULOSIS IN CATTLE

Alex Raeber, Bjoern Schroeder
Prionics AG

Narrative: BOVIGAM® (the Gamma Interferon test) received approval by the USDA in June of 2003 as an official supplemental test for diagnosis of bovine tuberculosis (bTB) in cattle. However, BOVIGAM currently has a very limited role in the US bTB eradication campaign in its role as a supplementary test to the Caudal Fold Test (CFT). Approval as a primary diagnostic test requires equivalency with the CFT as the currently approved primary diagnostic test. Here we report on a meta-analysis to review field trials comparing the diagnostic performance of BOVIGAM and the tuberculin skin test. A total of 15 field studies with 16,664 animals sourced from more than 175 herds in eight different countries and published between 1991 and 2006 were analyzed. Field studies were separately assessed based on the type of skin test (CFT: Caudal Fold Test; SCT: Single Cervical Test; CCT: Comparative Cervical Test) used. As reference test for all sensitivity studies and for some specificity studies, tested animals were slaughtered and subjected to examination for lesions and culture of $M. bovis$ from tissue samples. Specificity studies were conducted in herds with no history of bTB. The reported performance estimates for the two tests were analyzed for statistical significance by the Fisher’s Exact Test. A test was considered significantly different if a p value < 0.05 was obtained. In six of 15 studies involving 8,704 animals, BOVIGAM was significantly better than the skin test. Four of these studies assessed sensitivity (1 CFT, 1 SCT, 2 CCT), and two studies specificity (2 CFT). In a further seven studies with 1,266 animals, BOVIGAM was equivalent to the skin test. In four studies the sensitivity was determined (2 CFT, 1 SCT, 1 CCT) and three studies were aimed to estimate specificity (1 SCT, 2 CCT). Finally, in two of 15 studies with 2,543 animals, the skin test performed better than BOVIGAM. Both of these studies investigated specificity between the CCT and BOVIGAM. The CFT/SCT was determined to have a median sensitivity value of 75.3% and a median specificity value of 96.97%. The CCT was found to be slightly more specific with a median specificity value of 99.95% and a median sensitivity value of 74.3%. The corresponding median values for BOVIGAM were calculated as 84.6% for sensitivity and 97.4% for specificity. Analysis of data from 15 field studies that were conducted to compare the diagnostic sensitivity and specificity of the tuberculin skin tests and the BOVIGAM assay show that BOVIGAM performed equal or better than the single intradermal skin tests CFT and SCT with regard to both sensitivity and specificity while the CCT had a higher specificity than BOVIGAM but lower sensitivity. Based on these
data, BOVIGAM® should be considered for approval as official primary diagnostic test in the US bTB program. This would allow use of BOVIGAM® in new and more cost effective testing strategies such as for Test and Slaughter, Import Testing, Pre-movement Testing and Herd Screening.
PATHOLOGICAL LESIONS AND PATTERNS OF LUCIFERASE LUMINESCENCE IN CD-1 MICE EXPOSED TO AEROSOL AND SUBCUTANEOUS INFECTION WITH A RECOMBINANT NEUROVIRULENT WESTERN EQUINE ENCEPHALITIS VIRUS

Aaron Phillips, Tawfik Aboellail, Kenneth Olson
Colorado State University

**Narrative:** Two groups (10 mice each) of 5-6 weeks old, outbred CD-1 mice were infected either intranasally or subcutaneously dorsal to the cervical spine with a recombinant western equine encephalitis virus (WEEV). The virus was constructed based on the infectious clone of the severely neurovirulent McMillan strain of WEEV. The recombinant virus possesses a duplicate subgenomic promoter that drives the expression of firefly luciferase. *In vivo* imaging was conducted on an IVIS 200 instrument to compare degree and pattern of luminescence in infected mice versus control mice (3 uninfected animals) 10 minutes after injection of 150 mg/kg luciferin. For the *Ex-vivo* images, mice were injected with 150 mg/kg luciferin five minutes prior to euthanization. After humane and expeditious euthanization with inhalant gas (Iso-Flo), the heads of sacrificed mice were sagittaly split along the midline and immediately imaged at 24, 36, 48, 72, 84, 96 and 108 hours respectively. The severity of clinical symptoms and mortality rate was significantly higher in the intranasally infected mice than in the subcutaneous group. The degree and pattern of luciferase luminescence suggests that the virus spreads via olfactory nerve to the olfactory bulb in the intranasal route of infection. Pathologic lesions in the olfactory bulb are more concentrated in the glomeural layer, external plexiform layer and granular layer being more severe in the external plexiform layer. Multifocal neuronal and glial cell necrosis with status spongiosis of the neuropil and infiltration of affected areas by neutrophils are evident in the olfactory bulb as early as 48-72 hours postinfection (PI). In the subcutaneously infected mice, Luciferase luminescence was evident in the more caudal quadrants of cerebral hemispheres and tends to spare the cerebellum. Histologically those mice show more randomly scattered areas of perivascular necrosis and inflammation that are not restricted to the olfactory bulb.
II. C. USAHA JOINT SCIENTIFIC PAPERS, POSTERS AND ABSTRACTS

PREVALENCE OF SHIGA TOXIN PRODUCING E. COLI IN RETAIL AND GAME MEAT

Chitrita DebRoy¹, Huu Dang¹, Kudakwashe Magwedere², Edward Mills², Catherine Cutter³
¹Veterinary and Biomedical Sciences, Pennsylvania State University
²Department of Animal Sciences, Pennsylvania State University
³Department of Food Sciences, Pennsylvania State University

Narrative: Shiga toxin producing *Escherichia coli* (STEC) belonging to serogroups O26, O45, O103, O111, O113, O121 and O145, in addition to O157, have emerged as important food-borne pathogen of considerable public health significance. The objective of the study was to determine the level of contamination of these STEC O groups in retail ground meat and in game meat. The findings can assist regulatory agencies to consider measures to control contamination of these organisms in meat. Ground meat samples from beef, chicken and pork and game meat from deer, bison, wild boar, elk and rabbit were purchased. Ground meat samples (n=60, subsamples n=300) and game meat samples (n=55, subsamples n=275) were processed for the detection of *Escherichia coli* STEC O groups. Meat sample (5 g) was enriched in Tryptic Soy broth (TSB) containing 8mg/L of novobiocin and 16 mg/L of vancomycin, stomached for 2 min and incubated for 6 h at 37°C. Bile salts (1.5 g/L), rifampicin (2 mg/L) and potassium tellurite (1 mg/L) were added, and incubated for 18 h at 42°C. A positive control sample was prepared per batch where a known STEC strain was inoculated in meat and subjected to the same enrichment. DNA was extracted using Masterpure DNA purification kit and multiplex PCR for all 8 O groups listed above was conducted (DebRoy et al. 2011). Presence of Shiga toxin genes (stx1 and stx2) were tested on samples that exhibited the presence of STEC O groups, using m-PCR optimized in the laboratory. While none of the retail and game meat samples exhibited the presence of O26, 28% of ground beef samples carried *E. coli* O121 and 15% carried O45. Among ground chicken samples 43% samples exhibited presence of O157, 25% carried O45 and 18% carried O103. Of the ground pork samples tested 37% carried O121 and 6% O103. In game meat samples, deer meat and bison carried strains belonging to O45, O103, O111, O113, O121, O145 and O157, although only one sample belonging to O45 from deer carried stx1 genes. None of the retail meat samples carried stx1 or stx2. It is concluded that the meat samples in grocery stores and farmers markets may carry STEC O groups, but they are nonpathogenic and do not carry shiga toxins. Further work needs to be conducted with larger sample size to make definitive conclusions.

PREVALENCE OF VIRULENCE GENES IN ESCHERICHIA COLI STRAINS RECENTLY ISOLATED FROM PIGLETS WITH DIARRHEA SUBMITTED TO IOWA STATE UNIVERSITY VETERINARY DIAGNOSTIC LABORATORY: 2006 TO 2008

Subhashinie Kariyawasam¹, Curt Thompson², Chitrita DebRoy¹, Thomas Denagamage¹
¹Veterinary and Biomedical Sciences, The Pennsylvania State University
²Veterinary Diagnostic and Production Animal Medicine, Iowa State University

Narrative: Enterotoxigenic Escherichia coli (ETEC)-associated post-weaning diarrhea is an economically important disease for the swine industry. Most veterinary diagnostic laboratories in the US perform virulence genotyping of porcine ETEC by means of polymerase reaction (PCR) assays. These PCR assays often detect the following 9 virulence genes of E. coli: faeG (K88), fedA (F18), F41 (F7), fasA (987P/F6) and fanA (K99) fimbrial genes; and elt (LT), estA (STa), estB (STb) and stx2e (Shiga toxin-2e variant) toxin genes. This study was carried out to determine whether it is necessary to expand the gene coverage in current virulence gene panels to include recently described virulence genes such as astA (E. coli heat-stable enterotoxin 1 or EAST1) and sepA toxin genes, and aidA (adhesin involved in diffuse adherence, or AIDA-I) and paa (porcine attaching and effacing-associated factor) adhesin genes in porcine strains of ETEC. A total of 1,119 E. coli isolates obtained from diarrheic piglets submitted to the Iowa State University Veterinary Diagnostic Laboratory from January 2006 to July 2008 were screened for a total of 14 genes: five fimbrial genes (faeG, fedA, F41, fasA and fanA); six toxin genes elt, estA, estB, stx2e, astA and sepA); three adhesin genes (aidA, paa and eae (attaching and effacing factor) by PCR. Of 1,119 E. coli isolates tested, 227 strains (20.28%) possessed fedA, 176 strains (15.72%) possessed faeG, nine strains (0.8%) possessed F41, and one strain (0.08%) each possessed fanA and fasA. Among toxin genes, astA, estB, elt, estA, sepA and stx2e, were present in 429 (38.33%), 308 (27.52%), 262 (23.41%), 104 (9.29%), 104 (9.29%) and 45 (4.02%) isolates, respectively. The adhesin gene eae was present only in 10 (0.89%) isolates whereas paa and aidA were present in 282 (25.2%) and 137 (12.24%) isolates, respectively. This study demonstrated that recently described virulence genes are common in porcine ETEC and it may be useful to incorporate them into current virulence genotyping panels.
II. C. USAHA JOINT SCIENTIFIC PAPERS, POSTERS AND ABSTRACTS

QUANTITATIVE ASSESSMENT OF ADHERENT BACTERIA IN PORCINE INTESTINES

Saraswathi Lanka1, Victor Perez2, James Pettigrew3, Carol Maddox4
1Veterinary Diagnostic Laboratory, University of Illinois
2Manager Nonruminant Nutrition Research, ADM Alliance Nutrition, Inc
3Animal Sciences, University of Illinois
4Pathobiology, University of Illinois

Narrative: The objective of this study was to quantify by real-time quantitative PCR (qPCR), the proportion of adherent *Escherichia coli* populations in the intestines of pigs experimentally infected with F18 *E. coli*. Pure cultures of an enterotoxigenic F18 *E. coli* strain (LT, STB, SLTII), isolated at the University of Illinois Veterinary Diagnostic Laboratory from a field outbreak, were suspended in phosphate buffered saline (PBS) to a concentration of 1,010 colony forming units (cfu) per 3ml daily dose. Pigs weaned at 21 days of age were untreated (control), or orally inoculated with three consecutive daily doses of PBS (sham) or F18 *E. coli* (EC) starting at three days post weaning. Ileum and colon samples were harvested five days or 10 days post inoculation (PI) and mucosa samples were collected by gently rinsing off the ingesta then, removing a 1cm^2 area of mucosa from the intestine. Total genomic DNA extracted from the mucosa samples was subjected to SYBR green qPCR. Universal primers targeting the 16S rRNA gene and primers specifically targeting the gadAB genes and the F18 gene were used to enumerate total bacteria, total coliforms and F18 *E. coli* populations in the mucosal samples respectively by extrapolation from standard curves. Two standard curves were constructed for each set of bacterial primers: (i) using serial dilutions of a known concentration of the F18 *E. coli* (obtained by viable plate count) and (ii) using serial dilutions of a known concentration of F18 *E. coli* genomic DNA (direct measurement of total genomic DNA at 260nm). Primers targeting the villin gene were used to quantify the porcine enterocyte content of the sample by extrapolation from a standard curve constructed using villin primers and total genomic DNA obtained from the mucosal sample of a control pig. Colonization by F18 was ~75-fold higher at day five than day 10 while coliform and total bacterial counts were 6.7 and 4.7 fold higher, respectively. There was little difference between the levels of adherent bacteria in the ileum versus the colon. Average coliform counts ranged from 2,000-14,000 bacteria per cm^2 for sham challenged pigs. This qPCR method enabled the investigators to assess and compare colonization of the mucosa by pathogenic versus commensal coliforms or total bacterial flora per standardized area of the mucosal surface as well as their persistence over time.
SURVEY OF BOVINE RESPIRATORY DISEASE COMPLEX (BRDC) PATHOGENS FROM CLINICAL CASES SUBMITTED TO KANSAS STATE VETERINARY DIAGNOSTIC LABORATORY (KSVDL) USING A REAL-TIME PCR PANEL

Richard Hesse, Joe Anderson, Barbara Breazeale, Alex Fuller, Jianfa Bai, Elizabeth Poulsen, Gary A. Anderson, Mike Hays, Richard Oberst
Kansas State Veterinary Diagnostic Laboratory, Kansas State University

Narrative: The KSVDL initiated the use of a BRDC real-time PCR panel for diagnostic use in the summer of 2010. Samples routinely tested included clinical submissions from fatal BRDC cases as well as nasal swabs from live animals exhibiting respiratory disease. As of April 2011, a total of 530 samples have been submitted for BRDC real-time PCR testing; 322 were from tissues obtained at necropsy and 208 were swab samples usually received in the mail. Positive PCR results for one or more of the pathogens were observed in 54% of the tissue samples and 43% of the nasal swabs. Individual pathogen results from tissue samples were: Mycoplasma bovis (M. bovis) 41%, bovine viral diarrhea virus (BVDV) 38%, infectious bovine rhinotracheitis (IBR) 12%, bovine coronavirus (BoCV) 17%, bovine respiratory syncytial virus (BRSV) 5% and bovine parainfluenza virus (PI3) 4%. Concurrent infections from the tissue samples demonstrated that M. bovis and BVD were most frequent and infections where M. bovis was excluded demonstrated that BVDV and BoCV were the most frequent followed by BVDV and IBR. Individual pathogen results from swab samples were: M. bovis 18%, BVDV 5%, IBR 13%, BoCV 30%, BRSV 1% and PI3 4%. Concurrent infections from swab samples demonstrated that BoCV and M. bovis were the most frequent followed by BoCV and IBR. BVDV genotyping and isolation were conducted on a subset of the submissions; genotypes 1A, 1B and 2A were observed in approximately equal frequency and a number of the viruses were cytopathic in cell culture. Frequency and sequence alignments of the genotypes detected will be discussed. The preliminary data obtained in this survey demonstrate the utility of the BRDC real-time PCR assay as a diagnostic tool for pathogen detection and subsequent analysis of those agents.
THE NATIONAL SCIENCE ADVISORY BOARD FOR BIOSECURITY (NSABB)-WILL THEIR WORK IMPACT YOURS?

Tanya Graham
Veterinary and Biomedical Sciences Department,
South Dakota State University

Narrative: The NSABB is a federal advisory committee that was established in 2005 as a result of concern over dual use research and the potential implications for bioterrorism. The board is chartered to “[p]rovide advice, guidance, and leadership regarding biosecurity oversight of dual use research.”2 According to the NSABB charter, the NSABB board may have no more than 25 voting members. Voting members are considered special government employees with secret security clearances and are considered subject matter experts. These experts provide expertise in molecular biology, microbiology, clinical infectious diseases, laboratory biosafety and biosecurity, public health/epidemiology, health physics, pharmaceutical production, veterinary medicine, plant health, food production, bioethics, academia, national security, biodefense, intelligence, national security, and law and law enforcement. Voting members also provide perspectives in medical and scientific journal publishing, industry, public awareness, institutional biosafety committees, recombinant DNA, and export control. The NSABB does not authorize or ban specific experiments and only provides guidance on individual experiments at the request of the Secretary of HHS. The NSABB does, however, advise the Secretary of Health & Human Services (HHS), the Director of the National Institutes of Health (NIH), and the heads of federal agencies that conduct or support life sciences-related research by “…recommend[ing] specific strategies for the efficient and effective oversight of federally conducted or supported dual use biological research, taking into consideration national security concerns and the needs of the research community.”1,2 The current poster will discuss the development of the NSABB and their Proposed Framework for the Oversight of Dual Use Life Science Research: Strategies for Minimizing the Potential Misuse of Research Information. This document is intended to form a framework for the federal government to develop a system for the “Responsible identification, review, conduct, and communication of dual use research.”3

References:
NORTHEAST WILDLIFE DISEASE COOPERATIVE

Julie Ellis¹, Sarah Courchesne¹, Barbara Davis¹, Maureen Murray¹, Richard A. French², Inga Sidor², Salvatore “Frasca, Jr.”³, Joan Smyth³, Michelle Fleetwood², Alice D. Roudabush², Elizabeth Bunting⁴, Bruce Akey⁴
¹Cummings School of Veterinary Medicine, Tufts University
²NH Veterinary Diagnostic Laboratory, University of New Hampshire
³Connecticut Veterinary Medical Diagnostic Laboratory, Department of Pathobiology and Veterinary Science, University of Connecticut
⁴Animal Health Diagnostic Laboratory, Cornell University College of Veterinary Medicine

Narrative: The Northeast U.S. is a hotspot for emerging infectious diseases that affect both animals and humans because of its dense human populations and the presence of major ports like Boston and New York, where human and animal travelers pour into the country. West Nile Virus and Lyme Disease were detected here before anywhere else in the country. Eastern Equine Encephalitis and Tularemia persist in wildlife here, claiming both animal and human lives. In spite of our vulnerability, the Northeast does not have a designated wildlife disease laboratory capable of investigating potential disease outbreaks, nor for conducting surveillance to anticipate the emergence of new diseases before they become widespread. To address this gap, we are establishing the Northeast Wildlife Disease Cooperative (NEWDC), a state, federal, and private sector cooperative structure that will provide wildlife health and disease expertise in the Northeast U.S. NEWDC will complement and enhance federal and state wildlife diagnostic efforts already in place by bringing together regional stakeholders and facilitating communications. Wildlife health assessments and diagnostics for live and dead specimens will be conducted by several regional laboratories with expertise in (but, not limited to): terrestrial, freshwater, and marine wildlife pathology; zoonotic diseases; environmental toxicology and immunology; ultrastructural and molecular characterization of pathogens; bioterrorism and informatics. Membership in the NEWDC provides professional training in wildlife diseases, full-service diagnostics, disease fact sheets and other related literature, ready access to professionals and diagnosticians, inclusion in communications regarding regional wildlife disease issues, and assistance in development of research studies.
UNDERSTANDING THE ROLE OF RACCOONS AS INTERMEDIATE HOSTS IN THE EVOLUTION OF CANINE AND FELINE PARVOVIRUSES

Andrew Allison\(^1,2\), Justin Brown\(^1\), Mark Ruder\(^1\), Kevin Keel\(^1\), Carole Harbison\(^2\), Israel Pagan\(^3\), Karla Stucker\(^2\), Jason Kaelber\(^2\), Edward J. Dubovi\(^4\), Edward Holmes\(^3\), Colin Parrish\(^2\)

\(^1\)Population Health, Southeastern Cooperative Wildlife Disease Study
\(^2\)Baker Institute for Animal Health, College of Veterinary Medicine, Cornell University
\(^3\)Center for Infectious Disease Dynamics, Department of Biology, The Pennsylvania State University
\(^4\)Department of Population Medicine, College of Veterinary Medicine, Cornell University

Narrative: Canine parvovirus (CPV) is a host range variant of feline panleukopenia virus (FPV) which emerged as a new pathogen in 1978 (designated as CPV-2) and subsequently spread worldwide, infecting >80% of the world’s dog population. In 1979, a variant of CPV-2 (designated as CPV-2a) also spread globally and by 1980 had supplanted CPV-2. Although the molecular changes between CPV-2 and CPV-2a are well known, the evolutionary pathways by which they arose remain obscure. Herein we genetically and functionally characterize FPV- and CPV-derived viruses from raccoons and show that raccoons served as the intermediate host in the evolution of CPV-2a from CPV-2, and possibly in the emergence of CPV-2 from FPV. All raccoon viruses derived from FPV or CPV had key substitutions in the VP2 capsid protein that altered their interactions with the cellular transferrin receptors (TfR) of different host species. The mutations also altered the antigenic structure of the capsids, as determined by virus-specific monoclonal antibody binding. Cloning and expression of the raccoon TfR showed it was genetically intermediate between the feline and canine TfRs and that it was bound by both FPV and CPV-2, supporting the role of raccoons in the host adaptation of these parvoviruses in dogs and cats.
II. D. USAHA Membership Meetings
USAHA MEMBERSHIP LUNCHEON AND MEETING
MONDAY, OCTOBER 3, 2011
Steven L Halstead, Presiding

Sponsor’s Welcome was provided by Dr. Joanne Maki, Merial Ltd.

Treasurer’s Report
William L. Hartmann

The United States Animal Health Association continues to operate on a sound financial basis. The Association operated within the budget approved by the Executive Committee for fiscal year 2011. The Association’s income after expenses for FY 2011 was $19,717.

During fiscal year 2011, the Association earned $23,440 in interest, which was reinvested into CD and Money Market reserve positions. The Association’s net worth on June 30, 2011 was $1,214,263.

The audit committee met Sunday October 2, 2011, reviewed the fiscal year 2011 Statement of Financial Position and found that all financial affairs of the Association are in order.

This is my last meeting as your treasurer, and I want to thank you for the opportunity. I have enjoyed my six years on the executive committee. I have had the privilege of working with some very talented presidents over the years, including your current president, Steve Halstead.

Mr. President, that completes the treasurer’s report.

Dr. Bill Hartmann was presented with an award honoring him for service to the Association as Treasurer, 2005 – 2011.
II. D. USAHA MEMBERSHIP MEETINGS

State of the Association
Steven L. Halstead

I am honored to stand before you in presenting the State of the Association over the past year. I have treasured my experience as President serving this fine organization and with each of you as members.

Financially, you have heard from Dr. Hartmann that we continue to operate in good shape, with our assets exceeding $1.2 million. With our two year reserve benchmark surpassed, we have consciously focused on re-investing in the organization through Committee Support and other areas specified in the Strategic Operational Plan.

Our membership over the past year is slightly down, trending with the economy and changes in size of our member agencies and organizations. We are encouraging membership of newly identified allied organizations, in an effort led by Dr. Steve Crawford. I am also pleased to report early success with development of student membership in reaching out to the future leaders in animal health. Working with Dr. Valerie Ragan and the Center for Public and Corporate Veterinary Medicine, we are targeting students across the country with an interest in regulatory animal health.

At the meeting this year our attendance coming in to the meeting is projecting more than 1,000, slightly down from last year. Pre-registrations are equal to San Diego in 2009.

Our professional staff has been in place for five years now. Ben and Kelly have become well established, maturing as a structure. Over the past year, we have implemented a staff professional development plan, and look at other incentives to keep moving forward.

We continue to work under the direction of our Strategic Operations Plan. Items include:

- Topic Specific Symposia, working towards a proposed welfare conference
- Operation of a new web site
- Enhancing our Resolution Tracking Process
- Evaluating Dues Structure
- Implementing Committee effectiveness task force recommendations

Again, I wish to express my thanks to each of you for your dedication to this organization, and for the opportunity to serve as the 115th President of USAHA. Thank you.
II. D. USAHA MEMBERSHIP MEETINGS

Report of the Committee on Nominations
Richard E. Breitmeyer

The Committee met by conference call in August, and has approved this slate of officers for 2011-2012. The action of the Report of the Committee on Nominations will take place at 2:05 p.m., on October 5, 2012, during the Membership Meeting.

The 2011-2012 Nominations are:

OFFICERS
PRESIDENT.......................... David T. Marshall, Raleigh, NC
PRESIDENT-ELECT...................... David L. Meeker, Alexandria, VA
FIRST VICE-PRESIDENT............... Stephen K. Crawford, Concord, NH
SECOND VICE-PRESIDENT.............. Bruce L. King, Salt Lake City, UT
THIRD VICE-PRESIDENT............... David D. Schmitt, Des Moines, IA
TREASURER.......................... Annette M. Whiteford, Sacramento, CA

DISTRICT DELEGATES
NORTHEAST........S. “Buzz” Klopp, Delaware; Ernest W. Zirkle, New Jersey
NORTH CENTRAL.................Velmar Green, Michigan; Jay Hawley, Indiana
SOUTH.........................L. “Gene” Lollis, Florida; A. Gregario Rosales, Alabama
WEST..........................Bill Sauble, New Mexico; H. M. Richards, III, Hawaii
II. D. USAHA MEMBERSHIP MEETINGS

USAHA MEMBERSHIP MEETING
WEDNESDAY, OCTOBER 5, 2011
Steven L. Halstead, Presiding

Report of the Action of the Committee on Nominations
Richard E. Breitmeyer

OFFICERS
PRESIDENT........................................... David T. Marshall, Raleigh, NC
PRESIDENT-ELECT................................. David L. Meeker, Alexandria, VA
FIRST VICE-PRESIDENT......................... Stephen K. Crawford, Concord, NH
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NORTHEAST.....S. “Buzz” Klopp, Delaware; Ernest W. Zirkle, New Jersey
NORTH CENTRAL.........Velmar Green, Michigan; Jay Hawley, Indiana
SOUTH..............L. “Gene” Lollis, Florida; A. Gregario Rosales, Alabama
WEST............................Bill Sauble, New Mexico; H. M. Richards, Ill, Hawaii

Whereas a motion to approve the nominations was made, seconded and approved without dissent.

Passing the Presidential Gavel
Steven L. Halstead

Dr. Steven Halstead presents Dr. David Marshall with his president’s gavel as incoming president for 2011-2012.
It is with great honor that I stand here before you today and accept the position of the 116th President of this wonderful organization, the United States Animal Health Association. You can be assured that the confidence that you have placed in me has not gone unrecognized, and I will do my utmost to carry on the legacy of all of the distinguished leaders that have preceded me.

I’d also like to thank my colleagues in the Southern District for the confidence they had in nominating me for this position in Birmingham back in 2007. I must admit, I accepted the charge with more than a little trepidation, as I had always viewed the leaders of this organization with admiration and was questioning my ability to carry on that tradition. The past four years of service on the Executive Committee has only reinforced to me the skill and dedication that this group of officers possesses and applies to the task on a daily basis. With the support of the EC, our wonderful staff of Ben, Kelly and Linda, and you, the members, I feel confident that we can effectively address the many challenges that lie ahead. In addition, I specifically look forward to working with Dr. Clifford and all of the talented USDA-APHIS employees as we jointly address many of our upcoming challenges together.

You’ll find that I am not one for verbosity, and this address will be no different. I would like to briefly introduce myself however, as it only seems like yesterday that a young, 34-year-old burned-out mixed animal practitioner from Salisbury, North Carolina, loaded up a wife and two infants and headed to Raleigh to take a job with the North Carolina Department of Agriculture, running more away from things such as beeper shock and professional burnout than towards something. Little did I realize that I wasn’t leaving a career behind, but heading directly into the middle of the most gratifying professional experience that I could have imagined.

Several years of service in the department’s meat inspection program provided valuable experience in the areas of public health, public service, public policy, the legislative process, and learning the hard way the skills needed to negotiate and interact with people as part of the regulatory process. When I accepted the offer to serve as State Veterinarian in June of 2000, I immediately reaped the benefits of years of hard work by others as North Carolina was formally declared free of pseudorabies a few short months later. Little did I realize what was on the horizon. Eight months into the job brought along foot-and-mouth disease in the United Kingdom and the associated foreign animal disease and mass disposal planning opportunities, followed within the next four years by 9/11 and the emergence of bioterrorism, West Nile Virus, real live bullets as we dealt with our state’s first case of H7N2 low path Avian Influenza, confirmation of the first case of BSE in Washington and the associated media and enhanced surveillance repercussions, monkeypox, SARS, hurricanes, 117 sickened children with E.
II. D. USAHA MEMBERSHIP MEETINGS

coli 0157:H7 from a petting zoo at our State Fair, and the 2005 H5N1 “bird flu” hysteria. I’m not sure I would have survived those early challenging years without the security blanket that this organization provided, the institutional knowledge of my member colleagues, and their willingness to share that wisdom with me.

The United States Animal Health Association has achieved the reputation of and continues to remain the nation’s foremost authority and forum for developing solutions for animal health related issues and a voice to be respected and listened to. Our unique three-legged stool model of melding government, industry, and academia with the resolution process, supported by the consensus of the membership, has effectively served our mission during the past 115 years. Nowhere is that more apparent than in interactions with all branches of the USDA, other federal and state agencies, and with legislators in DC. One of my early impressions was serving for a brief stint as one of two USAHA appointed representatives on the Pseudorabies Control Board. I’m not aware of a better working example of the USAHA’s ability to assist in assessing a problem, develop a functional plan for a solution, and carrying out the mission to conclusion in collaboration with our federal partners and the affected industry stakeholders than the eradication of pseudorabies from the commercial swine population. The reach of our members has always and continues to spread far and wide – chairman of Secretary’s advisory committees, state disease advisory committees, Congressional testimonies – the list goes on and on.

The importance and impact of organization will be further tested by the current and impending budget cuts on both the state and federal level, as governments continue to reduce the investment in our animal health infrastructure. Last week I read that the joint House and Senate “Super Committee” formed by the Budget Control Act of 2011 earlier this year will be attempting to cut $1.2 trillion from nondefense discretionary programs, which actually comprise only 18% of the federal budget. It doesn’t take a genius to predict a drastic changing of the landscape of programs as we have historically known them. We’re already seeing it reflected in the current tuberculosis, brucellosis, Johne’s, and other cooperative programs, as well as dwindling funding for research and extension. It will be vitally important in the future that we as an organization collaborate, communicate, and work smarter and harder to continue to protect our multi-billion dollar animal agriculture industries.

In closing, I’d like to briefly share with you my goals for the upcoming year. During my four years on the Executive Committee, I have been fortunate to follow on the heels of wonderfully effective Presidents in Steve Halstead, Rich Breitmeyer, Jim Leafstedt, and Don Hoenig, as well as their immediate predecessors, and much has been accomplished in that time. These successes include revision of our Strategic Plan, web site redesign, formalization of internal operating policies, conducting a membership survey, modernization of our logo and “brand,” very successful topic specific
symposiums, and the list goes on. Your organization remains very strong and well positioned for the future. I will, however, attempt to focus much of our efforts on Strategic Plan item #12, that of strengthening the effectiveness of our primary means of communication and advocacy, our resolutions. My desire is to enhance our organization’s year round presence and ensure that the responses from the petitioned agencies are timely, thorough, and address the concerns of the committee issuing the resolution and will ask for your support in the development of a tracking tool to assist on that process. I also anticipate increased involvement from the Executive Committee, either through Dr. Crawford as chair of this year’s Government Relations Committee process, letters, or personal communication, in making sure that our resolutions receive the respect and attention that they deserve.

In addition, we will continue the ongoing process of staffing analysis. I continue to be amazed by the incredible work load that is professionally handled by Ben and Kelly in the St. Joseph office. As is typical of excellent employees, they are often rewarded by being asked to do more. We must ensure that they are staffed appropriately to support the expanding activities of the organization. We also want to enhance our ongoing excellent relationship with the AAVLD and support them as they investigate pursing the permanent staffing model that has been so successful for us.

We will also investigate potential opportunities for conducting a topic specific symposium. I have never been one to support holding a meeting for meeting’s sake, so will only move forward if we, as an organization, feel that the potential finished work product will directly be of significant benefit to our membership and the animal agricultural industries. Please feel free to contact me or any EC member directly with potential topics and justifications.

Again, let me close by thanking you for the privilege of serving as your USAHA President for 2012. I consider it a distinct honor, and look forward to working with you in the upcoming year.
II. D. USAHA MEMBERSHIP MEETINGS

Recognition of Immediate Past President
Richard E. Breitmeyer

Dr. Richard Breitmeyer presents Dr. Steven Halstead with a plaque honoring him for his service over the past year as president of USAHA.

Executive Director’s Report
Benjamin D. Richey

It is my pleasure to stand before you today at the 115th Annual Meeting, and it is hard to believe it has been five years since I first stood before this assembly of USAHA membership. I am pleased to report a strong meeting attendance this year. Pre-registrations exceeded 900 this year, and while not last year’s numbers, we are pleased with the continued strong turnout of USAHA, AAVLD and our federal partners. Projected total attendance is well over 1,100 between USAHA and AAVLD.

This meeting is a success because of the efforts of numerous individuals that dedicate their time. First, I must extend my highest personal thanks to Kelly. Many of you may know that I welcomed my third child earlier this fall – September 9 to be exact. I cannot thank Kelly enough for stepping up to allow me some time so spend with my family in this important arrival. And Mrs. Linda Ragland has again been in her top form this year, working with the hotel despite a challenging year. And of course Kim Sprout, whose efficiency in the office during this meeting is irreplaceable.

I want thank Dr. Bruce Akey and the folks from Cornell University, Dr. David Smith and the State of New York, and our colleagues at APHIS under Dr. Shere for helping to make the logistics run smoothly. And of course I thank Dr. Lein for his tireless efforts in welcoming us to the Northeast.

USAHA membership numbers have remained fairly steady, with a slight decrease over the previous year. Considering economic conditions, we
continue to operate with strong membership. The membership remains strong due to all of the leadership involved in our Committees. It has been said many times that the committees are the backbone of USAHA, and this is possible thanks to the expertise and dedication that lies within.

I want to give much credit to Dr. Halstead and the entire executive committee. As we are all asked to do more with less, the volunteer time that your officers put in is outstanding, and a pleasure to have such committed leaders for this organization.

We continue to look forward to ways that we can continue to improve our processes, and as always welcome your input for ways that we can better serve the members. That being said, I truly believe that the core of USAHA is extremely strong, so we are diligent to remain true to our roots of the association to fulfill its mission and purpose, while continuing to grow and evolve. I look forward to working with our new President Dr. Marshall and the rest of the executive committee over the coming year. Thank you.

Report of the Committee on Resolutions*
Richard E. Breitmeyer

The Report of the Committee on Resolutions is approved by consent calendar. Chair Breitmeyer reported a total of 40 resolutions submitted by Committees for 2011. The following resolutions were recommended to be combined by the Committee:

- 1, 11, and 17
- 2, 4, 5, 20, and 23
- 3, 19, and 31
- 13 and 39
- 29 and 33

A motion was made to combine these resolutions, seconded and was approved by the membership.

Each resolution was read providing an opportunity to remove from consent for individual review. The following resolutions were removed from the consent calendar:

- Resolutions 10, 13, 21, 28, 30, 32, and 34

The following resolutions were placed on the consent calendar, properly moved and seconded, and approved by majority vote of the membership.

- Resolutions 1-9, 11, 12, 14-20, 22-27, 29, 35-40

The membership reviewed the held resolutions, with the following resolutions, with the action noted.

- Resolution 10: Approved
- Resolution 13 and 39: Approved as Amended
- Resolution 21: Approved as Amended
- Resolution 28: Approved as Amended
- Resolution 30: Approved as Amended
II. D. USAHA MEMBERSHIP MEETINGS

- Resolution 32 and 34: Combined and Approved

*The full report of the Committee on Nominations and Resolutions is included in these proceedings.*
II. E. COMMITTEE REPORTS
REPORT OF THE USAHA/AAVLD COMMITTEE ON ANIMAL EMERGENCY MANAGEMENT

Co-Chairs: Marilyn Simunich, ID
Nick Striegel, CO

John Adams, VA; Bruce Akey, NY; Gary Anderson, KS; Joan Arnoldi, WI; Marianne Ash, IN; Deanna Baldwin, MD; Tammy Beckham, TX; Lisa Becton, IA; Danelle Bickett-Weddle, IA; Patricia Blanchard, CA; Richard Breitmeyer, CA; Becky Brewer-Walker, AR; Gary Brickler, CA; Peggy Brinkman, SD; William Brown, KS; Suzanne Burnham, TX; Heather C. Case, IL; Tony Caver, SC; Gregory Christy, FL; Neville Clarke, TX; Matt Cochran, TX; Leslie Cole, OK; Stephen Crawford, NH; Debbie Cunningham, OK; Glenda Davis, AZ; Kevin Dennison, CO; Leah Dorman, OH; Brandon Doss, AR; Cheryl Eia, IA; Brigid Elchos, MS; Dee Ellis, TX; Francois Elvinger, VA; Dave Fly, NM; James Foppoli, HI; Rose Foster, MO; W. Kent Fowler, CA; Jane Galyon, IA; Tam Garland, TX; Cyril Gay, MD; Robert Gerlach, AK; Linda Glaser, MN; Timothy Goldsmith, MN; Stephen Goldsmith, VA; Kristin Haas, VT; Greg Hawkins, TX; Burke Healey, CO; Carl Heckendorf, CO; Jan Hershenhouse, CA; Donald Hoenig, ME; Floyd Horn, MD; Dudley Hoskins, DC; Pamela Hullinger, CA; Carla Huston, MS; Gregory Jillson, NM; Kristen Johnson, CO; Karen Jordan, NC; Thomas Kasari, CO; Patrice Klein, MD; Anthony Knight, CO; Paul Kohrs, WA; Darlene Konkle, WI; Charlotte Krugler, SC; Michael Langford, MD; Elizabeth Launten, IA; Randall Levings, IA; Tsang Long Lin, IN; Mary Lis, CT; Martha Littlefield, LA; Frank Liu, MN; Amy Mann, DC; Barbara Martin, IA; Sarah Mason, NC; Chuck Massengill, MO; Thomas McGinn, III, DC; Paul McGraw, WI; David Meeker, VA; Samia Metwally, NY; Gay Miller, IL; Sarah Mize, CA; Janice Mogan, IA; Christine Mondak, IA; Alfred Montgomery, MD; Lee Myers, GA; Cheryl Nelson, KY; Sandra Norman, IN; Dustin Oedekoven, SD; Kenneth Olson, IL; Kristy Pabilonia, CO; Elizabeth Parker, DC; Michael Parker, DC; Boyd Parr, SC; Jewell Plumley, WV; Holly Poremski, TX; Jeanne Rankin, MT; Tom Ray, NC; M. Gatz Riddell, Jr., AL; Paul Rodgers, WV; Keith Roehr, CO; James Roth, IA; John Rowden, CA; Mo Salman, CO; John Sanders, WV; A. David Scarfe, IL; Mark Shearer, IA; Gary Sherman, DC; Julia Smith, VT; Harry Snelson, NC; Mike Starkey, MN; Katie Steneroden, CO; Darrel Styles, MD; R. Flint Taylor, NM; George Teagarden, KS; David Thain, NV; Jimmy Tickel, NC; Peter Timoney, KY; David Tomkins, TX; Jesse Vollmer, ND; Liz Wagstrom, DC; Patrick Webb, IA; Stephen Weber, CO; Randy Wheeler, IA; Annette Whiteford, CA; Brad Williams, TX; John Williams, MD; Ellen Wilson, CA; Taylor Woods, MO.

The Committee met on October 1, 2011 at the Adam’s Mark Hotel in Buffalo, New York, from 8:00 a.m. to 2:00 p.m. There were 66 members and 84 guests present.
Co-chairs Simunich and Striegel provided a welcome to members, reviewing 2010 Resolutions and Responses. Supportive responses were received from USDA on 2010 resolutions regarding National Veterinary Stockpile Catalog, Restricted Animal Vaccine Usage Guidance, Animal Agriculture Critical Infrastructure Protection. The Committee Mission Statement was reviewed, as well as details for the Committee business meeting.

USDA-APHIS-VS Emergency Management and Diagnostics Programs Update
Dr. Jose R. Diez, Associate Deputy Administrator
USDA-APHIS-Veterinary Services (VS), National Center for Animal Health
Emergency Management (NCAHEM)

APHIS Emergency Management and Diagnostics (EM&D) consists of five units: The National Veterinary Services Laboratories (NVSL); the Center for Veterinary Biologics (CVB), the National Center for Animal Health Emergency Management (NCAHEM) which consists of Preparedness and Incident Coordination, Interagency Coordination, and National Veterinary Stockpile.

FAD PReP Documents: Preparedness and Incident Coordination (PIC) is headed by Dr. Jon Zack. Dr. Zack and his team continue to improve the Foreign Animal Disease Preparedness and Response (FAD PReP) tool box. The FAD PReP raises awareness, defines expectations and improves capabilities for FAD preparedness and response.

Despite the fact that we invest a lot of man power in to preparedness, we recognize that stakeholder engagement is crucial to planning and response. Therefore, we started a series of Stakeholder meetings to make our Stakeholders aware of our capabilities, listen to their concerns, and together, develop a new FMD response strategy that includes vaccination as a viable response tool. Dr. Jane Rooney will speak more on that.

Dr. Zack’s team continues to develop and refine several preparedness documents that can be found in the FAD PReP websites:
https://fadprep.lmi.org

In 2011 PIC created and refined several preparedness and planning materials in the categories of response plans, SOPs, ready reference guides, NAHEMS guidelines, and industry manuals. Some of these materials include the HPAI and FMD Red Books; National Animal Health Emergency Management System (NAHEMS) Guidelines that address Surveillance, Epidemiology and Tracing, FMD Vaccines, Mass Depopulation, Industry Manuals - Beef Feedlot, Swine, Dairy; Ready Reference Guides that address control areas, movement control, FMD response strategies, and Standard Operating Procedures (SOPs) for epidemiological investigation and tracing, biosecurity, etc.

Of note is that the NAHEMS guidelines and the Industry Manuals are developed in cooperation with Iowa State University.
In 2011 PIC collaborated on several continuity-of-business projects, including the Secure Egg Supply and Secure Milk Supply. The continuity of business collaborations are public-private-academic partnerships to develop strategies and capabilities for the management of non-infected premises and non-contaminated animal products in FAD regulatory control areas.

Other tools being cooperatively developed are the California Department of Food and Agriculture (CDFA) – California Animal Health Emergency Management System (CAHEMS) tool (for responders in an incident command post structure), and the Texas A&M Foreign Animal Zoonotic Disease Defense (FAZD) Emergency Response Support System (ERSS) tool, which is a prototype emergency management dashboard.

**National Animal Health Emergency Response Corps (NAHERC):** NAHERC was formed in 2001 to provide an emergency reserve of veterinary professionals to assist State and Federal responders during an animal health emergency. NAHERC volunteers become temporary Federal employees when activated by USDA. In 2011, NAHERC increased enrollment and name recognition among the animal health community. To date, 1,640 applicants have qualified for NAHERC through the USAJOBS web site: these include 678 veterinary medical officers and 962 animal health technicians. NAHERC personnel receive training via computer-based training modules available through Iowa State University. These training modules were developed in coordination with the National Veterinary Accreditation training modules. 830 users have completed at least one module. PIC produces a NAHERC news letter to keep APHIS personnel and Stakeholders informed.

**Interagency Coordination Staff:** Dr. Mark Teachman is Director of the Interagency Coordination (IC) group which coordinates APHIS’ interaction with other agencies inside and outside the federal government. IC staff identifies resources and clarifies roles in an animal emergency through participation in interagency and international working groups and permanent assignments at other Federal agencies. The ICS participates in the development of radiological animal health response strategies in the U.S. Most recently, our radiological response Subject Matter Expert (SME) traveled to Japan with the International Fund for Animal Welfare to help the Japanese government develop strategies for radiological survey and rescue of livestock, pets, and wildlife from the 20K exclusion zone around the Fukushima Dai-ichi Nuclear Power Plant. IC Staff embedded at the National Center for Military Intelligence (NCMI), co-authors intelligence products and responds to Department of Defense (DOD) requests for information. They also support the Intelligence Community collections requirements to obtain critical health and infectious disease information. IC staff contributed to the FDA’s development of the Food Related Emergency Exercise Boxed (FREE-B) set: A collection of scenarios that will help government regulators, public health organizations, and industry partners (stakeholders) test their readiness for food emergencies.
IC staff contributed to FEMA’s development of a training video that addresses the best practices for disposal of contaminated biomass in the case of an agricultural emergency. IC staff works on cross border collaboration issues as briefed by Dr. Jane Rooney.

While the Interagency Coordination group is specifically charged with interacting with other groups, all of NCAHEM - Planning and Incident Coordination, National Veterinary Stockpile and Interagency Coordination-work with many sectors involved in animal health emergency management. This chart gives an idea of the variety of collaborators for NCAHEM as a whole.

**3-D Planning:** within NCAHEM three staff members concentrate their time and effort in the specialized areas important to animal health emergency response: Depopulation – Darrel Styles; Disposal – Lori Miller and Disinfection – Nate Birnbaum.

**Depopulation:** NCAHEM continues to partner with DHS, and the EPA to fund research projects related to cleaning and disinfection methods. APHIS and DHS Science and Technology, in a joint effort, initiated projects to develop on-farm gas depopulation of swine (initiated 2009 and concludes 2012); improve and validate the use of captive-bolt technology (both portable pneumatic bolt and extended-bolt hand-held devices) for the mass depopulation of cattle (initiated 2011 and concludes 2013). VS and Animal Care continue to support and improve the foaming technology for poultry working towards making it acceptable as a euthanasia technology. Recent improvements to foam include developing foam technology to address caged reared poultry and using foam as a disinfectant tool.

**Disposal:** NCAHEM has invested in two research efforts regarding disposal: first is a joint APHIS and EPA effort to evaluate the emissions of a pathogen during the rendering process so that containment and targeted cleaning can be developed (ongoing now); and the second project will be launched this year is the logistical infrastructure pilot project which identify and map disposal resources (e.g. rendering, carcass competent managed landfills) initially in two states. NCAHEM also maintains an emergency management tools Web site that includes a carcass disposal decision tree and several online training modules detailing composting, onsite burial and treatment, secure transport, offsite burial and treatment, and cleaning and disinfection. The site also has a database function which identifies disposal locations around the country. In collaboration with EPA, the database was expanded to include rendering facilities in 2010.


**Disinfection:** working with ARS and EPA to develop substantiating data for the use of selected generic chemicals during an emergency animal disease situation when there are no or few EPA registered disinfectants or these registered disinfectants are not available (completing year 3 of projected 5 year study).
The National Veterinary Stockpile (NVS): The NVS was established by Presidential Directive (PSD-9) in 2004 to protect the nation’s food supply. The mission of the NVS is to provide the veterinary countermeasures (supplies, equipment, field tests, vaccines, and response support services) that States, Tribes, and Territories need to respond to damaging animal disease outbreaks. Dr. Lee Myers will brief the NVS in detail.

Critical Mass for Animal Health Emergency Response
Dr. Jack Shere, Eastern Region Director
USDA-APHIS-VS
Dr. Shere will be presenting a national summary in regard to State and Federal employees, job categories, and boots on the ground response capabilities. From surveys of state and federal personnel, approximately 90% of state animal health personnel would be available for an in-state response, while only 35% (153 veterinarians plus others to total 406) would be made available for an out-of-state response. About 80% of federal animal health personnel could be utilized for an in-state response, where 77% (1353 – one third of which are veterinarians) might be made available for an out-of-state deployment. 375 of those federal persons would be boots-on-the-ground personnel. As of July 2011, five hundred (500) state and federal foreign animal disease diagnosticians (FADDs) are available for a foreign animal disease investigation.

Cross Border Collaboration Issues and PWNER (Pacific-Northwest Economic Region) Action Items
Jane Rooney, USDA-APHIS-VS, NCAHEM
The 2011 Cross Border Livestock Health Conference (CBLHC) took place July 21 and 22, 2011 in conjunction with the 21st Pacific Northwest Economic Region (PNWER) Annual Summit. The CBLHC focused on the impact of a hypothetical Foot-and-Mouth Disease (FMD) outbreak in the Pacific Northwest affecting the USA/Canada border. Participants discussed preparedness, response and recovery using a scenario driven workshop format.

The main objective of the two day conference was to enhance cross border cooperation on animal health issues. Specific objectives were:
- Enhanced relationships and build networks between U.S. state and Canadian provincial jurisdictions
- Exchange information on animal health issues/concerns
- Develop a common understanding of disease policies
- Exchange information on emergency response for emerging and foreign/transboundary animal diseases
- Advance Canadian and American animal health interests
- Identify and execute action items to collectively address animal health and cross border issues
At the end of the session action items were developed based on the discussion that took place over the past two days. Action item leads and team members were also identified. Dr. Rooney will describe in more detail progress to date on Action item #1 (below) and give an update on related National Center for Animal Health Emergency Management activities.

- Action Item 1 - FMD Vaccination - work with stakeholders to prepare in advance and build a common understanding of the tools (vaccination) and strategies that can be used to respond to an FMD outbreak in both Canada and the U.S.
  Team Lead - USDA - Dr. Jane Rooney, CFIA - Dr. Tom Smylie
  Team Members - Dr. Jag Dhanda - CFIA

**USDA-APHIS and CFIA Project for Enhancing Zone Recognition**

Francine Lord, Director, Deputy Chief Veterinary Officer for Canada and Director, Terrestrial Animal Health Division (TAHD), Canadian Food Inspection Agency (CFIA)

The objective of this project is to enhance mutual understanding of each country’s processes for zoning and potentially enable the agencies to formally recognize each other’s zoning decisions in the event of a foreign animal disease (FAD) outbreak, with the goal to minimize the disruption of trade from disease-free zones while ensuring the safety of this trade.

In order to assess zoning processes in each country, an evaluation of the veterinary infrastructure was necessary, including legislation, organization, human and material resources, reporting, disease control programs, foreign animal disease preparedness and response, and monitoring and audit programs. Secondly, a review of the procedures for establishing a zone was conducted, including the different phases for zoning (suspect, investigation, activation, action, and return to normal) and how the integrity of the zone is maintained. Details of the zoning procedures were all thoroughly reviewed and evaluated, including definitions, investigation methods, sampling, diagnostics, outbreak epidemiology and tracing, reporting, movement controls, farm biosecurity, vector/wildlife control, surveillance, disposal of contaminated material, surveillance in disease free areas, decontamination, cleaning, disinfection, vaccination, and finally, proof of freedom.

Documents have been prepared and exchanged on the veterinary infrastructure, surveillance, disease monitoring and national emergency response plans in the event of an FAD introduction (focus on highly contagious diseases such as foot and mouth disease). Currently an overall evaluation document of the other country’s capacity to contain and eradicate FAD outbreaks by zoning is being completed before year-end. This document will then be subjected to the review and critique of the veterinary authorities in each country and a decision taken by the Chief Veterinary Officers.
Benefit of Harmonized Import Conditions for Canada – USA
Debbie Barr, National Manager
Import/Export Section, TAHD, CFIA

The objective of this presentation is to discuss one health and emergency management principles from an international trade perspective and to introduce the concept of anticipation into the traditional model of prevention, detection, response and recovery.

In the complex environment of animal, public, economic and environmental health, anticipation and prevention are key but often overlooked factors in the emergency management continuum. Much focus is placed on disease management and early response but what is really wanted is to keep disease out wherever possible. There are many situations that can’t be controlled, such as, migratory animals, climate change and vector incursions and illegal imports. Import conditions are, however, designed to mitigate the possibility of disease entry through legal importation. The volume of trade between Canada and the U.S. is significant and international trade decisions taken by one country can easily affect the other. As such, it benefits both countries to harmonize import conditions where possible and where disease status is equivalent. Criteria for defining harmonized conditions include the recognition that the goal is equivalence of outcomes rather than identical import conditions. Other criteria include recognition of international guidelines, agreement on the diseases of concern, how to best evaluate those diseases, options for risk mitigation and agreement on disease response principles. Examples of current initiatives and areas of future opportunity will be provided.

Finally, it is also important to realize that decisions made during disease preparation and response can significantly affect market recovery. Implementation of vaccination strategies and timing of cleaning and disinfection of infected premises can shorten or lengthen the duration of trade disruptions. Perspectives between domestic producers whose animals have been affected by a disease and exporters of the same species of animals can differ widely and communication is essential to ensuring a shared viewpoint can be reached.

National Veterinary Stockpile Progress and Navajo Nation NVS 2011 Logistics Exercise
Lee Myers, NVS State Federal Liaison
USDA-APHIS-Veterinary Services (VS), NCAHEM

Dr. Lee Myers, State Federal Liaison for the National Veterinary Stockpile (NVS), APHIS VS, shared with the Committee about the progress of NVS Program since the 2010 USAHA annual meeting. She also reviewed highlights of the recent NVS full scale logistics exercise with the Navajo Nation.

Dr. Myers reviewed theAPHIS list of damaging animal diseases and explained that the list was under review. Dr. Cyril Gay, Agricultural Research
Service, will lead this effort and is expected to report to the NVS Strategic Steering Committee in December of 2011. The list not only identifies damaging animal disease threats, but also prioritizes their concern. Dr. Myers then reviewed the countermeasures that the NVS program acquired over the past year. Two additional modules are now available to support emergency vaccination. The modules contain vaccination ancillary supplies, such as self-refilling syringes, disposable needles and syringes, sharps disposal containers, all-weather paint sticks, ear tagging pliers, and foot and mouth disease pink vaccination ear tags. A contract that will support cold chain transportation, such as shipping containers and temperature monitoring devices, is expected to be awarded soon. The NVS program has also purchased multiple sets of large animal handling equipment, including cattle and swine gates and panels, cattle and swine mobile chutes, and mobile corrals. The equipment is stationed with contractors required to store, maintain, repair, deploy, and set up the equipment when needed. The NVS program can procure additional large animal handling equipment through existing indefinite delivery/indefinite quantity contracts.

Dr. Myers was very pleased to announce the posting of an NVS Logistics Catalog on the NVS website accessible only to NVS planners. The Catalog describes the contents of 24 Hour Push Packs, vaccination ancillary and antiviral supplies, large animal handling and poultry depopulation equipment, carcass disposal supplies, and communication equipment. The Catalog addresses the 2010 USAHA Resolution initiated by the Committee on Animal Emergency Management and will assist NVS planners to better understand the type and kind of countermeasures available.

Dr. Myers then explained the improvements and revisions to the updated NVS Guide for Federal, State, Tribal, and Territory Officials and the NVS State Plan Template, both soon posted on the public NVS website to assist in NVS preparedness efforts. Enhancements to both documents were based on lessons learned from planners using the documents to write NVS plans and conduct logistics exercises.

Dr. Myers reviewed the highlights of the Navajo Nation and NVS 2011 Logistics Exercise in April. The event represented the first APHIS-sponsored full scale exercise on Tribal lands and illustrated the partnership between APHIS and the Navajo Nation in preparing to respond logistically to an animal disease outbreak. USDA Undersecretary for Marketing and Regulatory Programs Edward Avalos and Navajo Nation President Ben Shelly both attended the exercise and commemorated the occasion with a press conference. More than 28 agencies and organizations participated in the exercise with representatives serving in the roles of players, observers, evaluators, or controllers. The exercise was a distinct success in meeting the exercise objectives of testing the NVS program’s ability to deploy and ship NVS countermeasures based on a request from the Navajo Nation. The exercise also tested the implementation of the Navajo Nation NVS Tribal Plan to conduct logistics warehouse and inventory management operations. Lessons learned from the exercise will ensure both agencies are well
equipped to protect animal agriculture from potential damaging animal diseases in the future.

FMD Cross-Species Communication Team … A Unified Approach Preparing for an FMD Outbreak

Cindy Cunningham, Assistant Vice President, Communications
National Pork Board

If a widespread Foot and Mouth Disease (FMD) outbreak occurs in the United States, it will require a fast, unified and coordinated response from both the government and livestock industry associations. Prompted by the 2001 outbreak in the United Kingdom, the U.S. beef, pork, dairy and sheep industries recognized the need to prepare and take action, in case a similar situation were to arise in the country. As a result, the communications and issues management specialists from National Cattlemen’s Beef Association (NCBA), the National Pork Board (NPB), American Sheep Institute (ASI) and Dairy Management Inc. (DMI) have worked together to develop a coordinated communications response plan.

Understanding Consumers’ Perceptions

The FMD team conducted research to better understand how consumers felt and perceived issues surrounding FMD, to lay the foundation for communications planning and message development. The research demonstrated that consumers lack knowledge about FMD. In fact, when surveyed, 72 percent of consumers thought FMD affected humans. Another 69 percent of consumers believed people could contract FMD from eating infected meat. Clearly, consumer misconceptions would need to quickly be addressed with strong messaging, delivered consistently across the industry.

Consumer research also identified the types messengers who would best resonate with the public during outreach and education following an outbreak.

- **Industry spokespeople** are the most credible and reassuring when responses are consistent and provided by a variety of sources.
- **Livestock producers** are credible when speaking about the actions farmers take on the farm and how they cooperate with officials.
- **Local government officials** are more credible than federal agencies because they are connected to the community.
- **Veterinarians** are most credible for consumer health information about FMD.

Consistent Response

Based on the research, the FMD team developed core messages and informational materials, such as initial standby statements and media fact sheets. While these materials continue to evolve based on new information and insights, they provide a consistent platform from which the industry can speak in the event of an outbreak. The umbrella FMD crisis response plan – developed and adopted by all team members – is designed to create a unified response, with a strong message platform and strong government
partnerships to leverage during an outbreak. Such planning and reliable partnerships will help position the industry to respond in a unified manner, ensure consumer confidence in meat and milk safety, alleviate confusion and concern, and help protect animal health and the livestock industry.

Don Hoenig
Maine State Veterinarian
This presentation presented a review of the Secure Milk Supply Project that the six New England states have been conducting over the past 18 months with funding assistance from a USDA-APHIS-VS cooperative agreement. This project was designed to examine milk movement in New England and propose a system under which milk farmers and processors could continue to ship milk during a foot and mouth disease (FMD) outbreak in the region. A consultant, Richard Horowitz from Rhode Island, was hired to implement the work plan of the cooperative agreement. The first phase of the project involved gathering and compiling data on milk movement within New England. The second phase, which started on July 1, 2011, will draft plans for a permitting process for milk movement in New England in the event of an FMD outbreak. A tabletop exercise, tentatively planned for the spring of 2012, will be incorporated into this phase of the project.

Continuity of Diary Business Operations: Logistics of Bulk Tank Milk (BTM) Sampling and Testing During an Animal Health or Food Safety Emergency
Stephanie R. Ostrowski
California Animal Health and Food Safety, Food Safety Resident (UC Davis)
Nationally, development of emergency response protocols which utilize bulk tank milk (BTM) samples as part of farm-level screening during an animal health or food safety emergency response has been identified as a priority need. This project explores the utilization of routinely collected BTM samples in California for rapid testing in the event of an animal health or food safety emergency. Regulatory authority, sample collection and identification, transport of samples to the diagnostic laboratory, accessioning, and results reporting are the key elements addressed.

The challenge will be to rapidly and efficiently test each farm’s bulk tank(s) in the geographic area of concern during a response to a perceived animal health or food safety threat. We propose a strategy to maximize the use of routinely-collected BTM samples to assist regulatory authorities and diagnostic laboratories to rapidly identify adulteration (chemical, microbial or radiological); the presence of a specific disease organism (FMD virus); or where negative, to demonstrate absence of the agent of concern. This type of information may be critical to maintain or restore consumer confidence and enable continuity of business during a response.
This planning activity supports California Department of Food and Agriculture (CDFA) emergency planning activities. It assumes that bulk tank sampling and testing by veterinary diagnostic laboratories may be required during future animal health and food safety emergencies such as feed mixing errors, foreign animal disease responses, and agro-terrorism threats.

The benefits of pre-planning BTM sampling logistics include: avoiding interruptions in raw milk movement from dairy farms to processing; maintaining a continuous supply of wholesome milk and milk products to consumers; and maintaining business continuity for dairy producers, haulers, and processors through appropriate response planning.

FAZD ERSS Outbreak Tool and NAHLN Capacity Calculator

Jim Wall and Tammy Beckham – Department of Homeland Security (DHS) Foreign Animal and Zoonotic Disease Defense Center (FAZD), Texas A&M University System

The Emergency Response Support System (ERSS) is an integrated, fully distributed, multi-purpose system for emergency managers that is capable of supporting the overall emergency response cycle by featuring operational, training, and analytical functionality as it relates to an animal disease outbreak. Once an outbreak occurs, whether naturally occurring or human-induced, response presents a complex challenge that very quickly involves several levels of decision makers (local, state, and federal). A common integrated view of all data (visual and textual) pertaining to an incident derived from authoritative sources and being presented to decision makers is vital to the effectiveness of the overall command and control environment.

ERSS is being developed using innovative technology referred to as the Information Dashboard Framework (IDF) which will allow information sharing between USDA and state points of contact. IDF is a composable dashboard interface that allows rapid construction of a user-defined operational picture consisting of integrated maps and overlays, reports, decision support tools, data visualization, and video feeds that are dynamically updated. ERSS provides enhanced response capabilities by rapid sharing and organizing of relevant data from authoritative sources to decision makers wherever they may be thus facilitating shared situational awareness. Operational and economic efficiencies are realized from a single tool that supports both training and operations. Additional economic efficiencies result from the use of shared components and acceleration of the development process being enabled by use of the IDF. Finally, use across different agencies helps to mitigate interoperability issues. ERSS is a joint collaboration between USDA-APHIS, Veterinary Services, Emergency Programs (APHIS) and the Foreign Animal and Zoonotic Disease Center (FAZD).
Animal Health Emergency Cross-Border Panel Discussion and Questions
Time was reserved for questions for the speakers including: Jose Diez, Jack Shere, Jane Rooney, Francine Lord, Debbie Barr, Lee Myers, Cindy Cunningham, Don Hoenig, Tammy Beckham, and Darryl Styles.

VET-LRN, CVM’S New Laboratory Response Network
Renate Reimschuessel, FDA, Center for Veterinary Medicine, Veterinary Laboratory Response Network
In 2010, CVM obtained funding to create a Veterinary Laboratory Response Network (Vet-LRN) that will work with veterinary diagnostic laboratories to coordinate facilities, equipment and professional expertise of veterinary diagnostic laboratories to respond to high priority chemical and microbial feed/drug contamination events. This network examines data in reportable foods registries and other FDA portals to facilitate early detection of any animal feed adulteration. These efforts can contribute to overall food safety as animal feed events could signal potential issues in the human food system.

FDA’s network Veterinary Laboratory Response Network is partnering with academic veterinary diagnostic laboratories to document, investigate and diagnose animal feed or drug related illnesses. These activities are supported by cooperative agreements which facilitate methods standardization, training and proficiency testing of the partner laboratories. Such activities strengthen the overall food safety system by developing increased capacity and capabilities to detect adulteration which could affect animals raised for human consumption or companion animals consuming ingredients used in both animal and human food products.
Kevin Dennison, Western Region Emergency Programs Manager
USDA-APHIS-Animal Care

Multi-Agency Coordination:
- APHIS Animal Care has been engaged for some time in discussion among FEMA, USDA, and national stakeholders about effective mechanisms for coordination on animal issues during large scale emergencies. National Level Exercise 2011 (New Madrid Earthquake) piloted a pets MAC effort that was informative in spite of some serious exercise-related challenges. A revised concept of operations plan will be developed to provide a framework for real-world major incidents.

APHIS Animal Care Program Response Team (PRT):
- AC’s regulatory responsibilities include potential confiscation of animals under the authority of the Animal Welfare Act. Such confiscations could range from one dog, to one elephant, to 50 dogs or 100 tigers, requiring AC to develop a flexible and scalable incident management capability. In August, we held a three-day training workshop for our PRT members. The PRT will be able to provide a seven-plus-member incident management group to help lead AC and partner efforts in varying scale confiscation incidents. The AC PRT will also be a resource available to States during disasters through a request to FEMA.

Zoological Contingency Planning:
- AC’s Zoological Facility Contingency Planning Best Practice Working Group (ZBPWG) is complete and the products are available at www.zooanimalhealthnetwork.org. These include guidance documents on developing emergency plans for zoological facilities. This spring and summer, three zoos evacuated in North Dakota and Nebraska due to serious flooding (Minot and Bismarck, ND, and Scottsbluff, NE). The ZBPWG materials were shared with these facilities and initial conference calls were held with the zoos, the Association of Zoos and Aquariums, and USDA to help provide insight on the use of the documents in planning response and recover actions.

NASAAEP Best Practice Working Groups:
- The National Alliance of State Animal and Agricultural Emergency Programs (NASAAEP) and Iowa State University, with support from APHIS, has created an Animal Emergency Response Library with which to share the products of the eight best practice working groups (Sheltering, Animal Search and Rescue, Evacuation and Transportation, Animal Decontamination, Veterinary Medical Care, Planning and Resource Management, Preparedness and Outreach,
and Training). Access is open to all, but you need to set up a user account. Access is through www.nasaaep.org.

Introduction to Animal Emergency Management:
- Animal Care has funded Iowa State University Center for Food Security and Public Health in the development of a 10 module course entitled Introduction to Animal Emergency Management. The primary purpose is to help train APHIS employees in supporting animal issues in natural and man-made disasters. The project is just now being completed. The primary audience is APHIS Animal Care employees with a secondary audience of other USDA, Federal, State or local emergency management personnel. This will not be a course for volunteers/responders.

Improvised Nuclear Device planning issues:
- Gordon Cleveland (VS) and Kevin Dennison (AC) have been APHIS representatives on a planning work group to attempt to identify and close gaps in national strategies pertaining to mass care and rescue operations following a nuclear detonation. Our emphasis is that animal issues (pets, livestock, and other animals) must be managed in order to better protect the public. While the issues are overwhelming, it is critical for State and local animal authorities and stakeholders to engage in radiological and nuclear planning efforts within their jurisdiction. Serious challenges exist in the mass decontamination of pets, livestock, zoo animals, and others, and further research is needed to identify true best practices and critical efficient protocols. Two USDA funded research projects (TAMU and CSU) are a good initial start in closing some of those research gaps.

APHIS Assignments to FEMA IMAT teams:
- Recently, APHIS personnel have been asked to serve in support of FEMA Incident Management Assistance Teams in support of State, Tribal, or local response to disasters. Animal Care served on the IMAT in Joplin, Missouri after the May tornado for five weeks, acting as a liaison between FEMA and animal response personnel and providing technical assistance to the local community. VS and PPQ have both been asked to serve with IMATs in various incidents as well.

Dr. Kevin Dennison  970-494-7433  Kevin.M.Dennison@aphis.usda.gov

3D Research Status Overview
Darrel Styles, Sr. Veterinary Officer
USDA-APHIS-NCAHEM

Disinfectant selection and use
- Use of Compressed Air Foaming Systems (CAFS) employing commercial disinfectant foams for the disinfection of housing, caging, transports, and environments of commercial poultry. This project is focused on the disinfection of poultry environments and equipment
against common poultry and public health pathogens (e.g. Salmonella, Campylobacter, Newcastle Disease Virus (NDV), and Avian Influenza [AI]). Cooperator is Texas A&M University; funded by AC highly pathogenic AI (HPAI) funds; technical oversight by VS.

- Efficacy of generic disinfectants (such as household bleach and citric acid) under a variety of conditions to verify that they will be effective in the field on wood, concrete, and metal surfaces against high-priority animal disease agents. The project should result in recommendations on concentrations of generic disinfectants effective against specific high-consequence organisms on defined surfaces. Research was conducted by Agricultural Research Service (ARS) with Environmental Protection Agency (EPA) funding and VS technical advice.

**Humane emergency mass depopulation**

- Emergency mass depopulation of poultry using high-expansion, medium expansion, compressed air, and CO₂ gas generated water-based foam projects are focused on performance, adaptation to multiple poultry species/settings, training, and improving humane performance parameters. Cooperators are University of Delaware, University of Georgia, Texas A&M University, and North Carolina Department of Agriculture; funded by Animal Care HPAI funds; technical oversight by Veterinary Services.

- Emergency on-farm inhaled gas mass depopulation of swine. This project examines the construction or adaptation of on-farm or easily acquired materials for the construction of ersatz gas chambers (e.g. roll-off dumpsters used to collect cull swine for rendering). The project has done extensive modeling on ideal gas filling dynamics and evaluated the use of CO₂ gas and CO₂ gas/N₂ gas mixtures to optimize welfare performance. Cooperator is North Carolina State University; funded jointly by the Department of Homeland Security, Science and Technology Directorate (DHS S&T) and VS.

- Development of a portable pneumatic captive bolt system for the emergency mass depopulation of beef and dairy cattle in large numbers. This project revives an extant technology and will re-engineer the devices to ensure a sufficiently high mortality rate with optimal humane performance. Cooperators are Iowa State University (Beef) and Western University (Dairy); funded jointly by DHS S&T and VS.

**Disposal**

- An APHIS/ EPA collaboration is underway to develop guidelines for safely using environmentally-friendly rendering to dispose of animal remains while containing pathogens and enabling plants to return to normal operations after emergency.

- Composting studies were completed (University of Delaware HPAI, Canadian Food Inspection Agency FMD), confirming that environmentally-friendly composting can inactivate pathogens.
An unlined burial study was partially completed (University of Saskatchewan), demonstrating that unlined burial can pose a significant risk to drinking water.

A DHS/EPA collaboration with APHIS input is underway to provide a transportable gasifier to destroy animal remains quickly with low air emissions and minimal energy needs.

Re-cap of USDA, University of Minnesota and State Animal Health Officials (SAHO) Permitting of Livestock Movement for Continuity of Business in Case of FMD

Gene Hugoson
Center for Animal Health and Food Safety, University of Minnesota

Key Points: SAHO FMD Dialogue Meeting

1. While SAHOs are clear on the protocol for FAD suspect investigations, human resource constraints and distance affect the time to complete the investigation and submit samples to the laboratory. The addition of NAHLN laboratories for provisional PCR screening has significantly reduced the timeline for many.

2. Considerable differences exist among SAHOs about when and with whom to share information about investigations and preliminary findings. The strength of interpersonal relationships and trust dictates the degree of early communications. Information will be shared with other regulatory officials before sharing with producers or food processing industry. SAHOs recognize the importance of enlisting industry both in the process of planning for an FAD response and during an outbreak response.

3. Statewide stop movement orders of 3 or more days will be the immediate response to confirmed FMD outbreaks. While recognizing that stopping all movements is impractical, risk analyses would facilitate an understanding of what constitutes a “dangerous movement.” SAHOs already recognize the need for expedited consideration of milk movement permitting.

4. SAHOs discussed targeting control measures based on a better understanding of animal and animal product movement for each commodity. Understanding industry practices and movement pathways will be critical for the accurate assessment of risk and allocation of resources in an outbreak scenario. Insufficient resources currently exist to address the permitting necessary for the anticipated volume of movement from non-affected premises within control zones.

5. SAHOs pointed to the opportunity for risk assessments of specific commodities to establish pre-approved permits for non-susceptible species and commodities representing negligible risk of disease spread. Active engagement of industry in understanding these risks is imperative and lends transparency to the process.
6. SAHOs feel that movement and permitting processes and information technology should receive highest priority from APHIS. APHIS can play a valuable role by establishing national standards. SAHOs recognize the difficulty of developing national data systems and encourage piloting of prototypes along with enhancements to existing IT systems to support movement and permitting.

7. Efforts are underway to develop model permits (multi-state partnership), to establish farm-level biosecurity risk assessments (Secure Milk Supply), and to complete proactive risk assessments to support pre-approved movement permits (Secure Egg Supply). SAHOs strongly endorse these efforts and support continued investments on movement and permitting process development.

Future Meetings:
- A small group meeting in person is preferable to a conference call or email.
- Emails and/or conference calls prior to in-person meetings are helpful.
- Brief and concise documents are needed such as the FMD red book overview as it is difficult to review large documents and provide meaningful feedback in a timely manner via email or conference calls.
- Conference calls could be used to elicit feedback from the SAHO working group for specific procedures, such as the model permits from the SES work.
- Future working group dialogues could be piggy-backed on other meetings such as the NIAA.
- Participants suggested mid-spring 2012 for the next meeting.

National Dialogue Meeting:
For the national dialogue meeting in November, we appreciated your suggestion for baseline “situational” presentations that set the stage for discussion of the needs/interests in the context of the overall FMD preparedness and response topic.
We appreciate your receptivity to sharing information from this meeting with the entire Assembly at USAHA.

Committee Business
Discussion and Vote of Resolutions and Recommendations
- Resolution 1 – IT Infrastructure for Electronic Certificates of Veterinary Inspection (eCVIs) for Canada/USA Livestock Movement – adopted.
- Resolution 2 – NAHLN Funding – adopted.

Meeting schedule and objectives for 2011 - 2012
- Monthly conference calls will remain the LAST Thursday of each month
REPORT OF THE COMMITTEE

- No November or December conference call for remainder of 2011
- Please review the Mission Statement for over-arching objectives; Committee members may suggest additional or alternate objectives by contacting the Committee chair persons

There was no new business introduced for discussion, and the Committee will hold the monthly conference call on October 27, 2011.
The USAHA/AAVLD Committee on Animal Health Surveillance and Information Systems (AHSIS) met on October 2, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 3:00 p.m. – 6:00 p.m. Ten members and 42 guests signed in; nine guests requested to be added to the Committee.

The co-chairs, Dr. François Elvinger, Virginia Tech, and Dr. Lisa Becton, National Pork Board, introduced the agenda and Committee mission statement, and reviewed 2010 Committee resolutions and responses on the establishment of a United States National List of Reportable Animal Diseases and on National Animal Health Laboratory Network (NAHLN) IT development.

There were no time-specific papers.

Two subcommittees are appointed within the AHSIS Committee, the National Animal Health Surveillance System (NAHSS) subcommittee, and the National Animal Health Reporting System (NAHRS) Steering Committee. Dr. Aaron Scott and Dr. Stan Bruntz, Veterinary Services (VS) Center for Epidemiology and Animal Health (CEAH) National Surveillance Unit (NSU) presented the annual updates on the NAHSS and the NAHRS.

In his presentation entitled “The State of the National Animal Health Surveillance System,” Dr. Scott reviewed the current state of the national surveillance system in the United States and needs emerging from the USDA VS 2015 Vision statement and the VS Management Team 18 implementation priorities for FY 2011-12, of which four related in particular to surveillance. These are Priority 13, implement a comprehensive, integrated surveillance plan for swine health; Priority 14, prioritize commodity specific surveillance plans and develop a timeline to address them; Priority 15,
develop policies and standards to address surveillance data confidentiality and information sharing; and Priority 16 on integrated, crossfunctional IT infrastructure. Veterinary Services is continuing to look at novel ways to collect and evaluate surveillance data, especially in light of the current budget challenges, in order to still maintain the overview of U.S. animal health. Dr. Scott reviewed the concept of stream-based surveillance and how it fits in the national surveillance plan. The new format is the umbrella for comprehensive integrated (CI) surveillance systems for both disease specific and diseases non-specific (syndromic) surveillance. CI-NAHSS currently is being reviewed for both swine and cattle. It will utilize information from slaughter plants, on-farm through accredited veterinarian observations, livestock markets and laboratory submissions. Texas has signed a cooperative agreement with National Surveillance Unit (NSU) for a pilot project to work with livestock market veterinarians to determine if there is an anomalous event that could require follow-up for animal health investigation, working cooperatively with Texas Veterinary Diagnostic Laboratories for testing needs and Texas Swine Extension on syndromic submissions from sentinel practitioners. This effort should provide a new spectrum of surveillance information by next year. Another project, the New Mexico alert system, is comprised of 18 veterinary practices that participate in a surveillance system reporting on “syndromes” observed in client populations. Dr. Scott commented on one case example in which an increase in reproductive issues in sheep could be traced back to toxins in plants. A new project is a voluntary surveillance certified program in which producers voluntarily provide info for program diseases, herd management, continuity of business, export trade support and trade certification, with samples collected at slaughter upon producer request. When a farm has submitted all required information which is evaluated for various characteristics in biosecurity and animal health, then that farm could receive certification for a specific disease status. Dr. Scott added that NSU welcomes input and ideas on how to implement.

The budget for surveillance is getting tighter so novel approaches for more efficient surveillance are being sought out. Such approaches include targeted sampling, use of historical data for targets and future surveillance sampling, combining surveillance streams and considering additional testing of samples collected for different purposes. NSU has strengthened its ability to use historical data to accomplish new surveillance goals with fewer samples and tests and thus more efficient use of funds. Risk-based sampling will increase in utilization when evaluating surveillance goals and targets for disease detection.

The NSU is further evaluating and developing African swine fever surveillance; looking at the increase in *M. avium* condemns for granulomatous lymph nodes and providing service and assistance to practitioners dealing with this issue; implementing a cattle granuloma submission program to evaluate if there is an increase in lesions for granuloma detection in fed cattle; working with the Scientific Certification
ANIMAL HEALTH SURVEILLANCE AND INFORMATION SYSTEMS

Systems (SCS) implementation for surveillance; evaluating sampling strategies and reductions of sample numbers for Pseudorabies virus (PRV) testing in swine. The NSU is further evaluating programmatic revisions for Brucellosis and PRV sampling reduction, TB predictive modeling. NSU is looking at the impact this will have on ability to detect and address infections and the level of confidence for detection at current levels of support.

Dr. Scott further reported that the National Surveillance Unit is working with the appropriate groups on harmonizing international standards, in particular with Canadian, Australian and New Zealand animal health authorities. NSU has been working closely with Canada on harmonizing approaches, especially the outbreak surveillance program and aquatic surveillance plans. NSU participated in an international meeting on surveillance and working on the surveillance terminology across participating countries. NSU has also participated with OIE on the guide book for the development of surveillance plans. The outcome is that the surveillance standards may become more harmonized across countries and trade routes. Dr. Scott gave kudos to Dr. Elvinger for his assistance with surveillance efforts and development for the betterment of U.S. animal health.

Dr. Stan Bruntz, USDA-APHIS-VS-CEAH-NSU presented the “NAHRS Update and National List of Reportable Animal Disease Overview”. Dr. Bruntz reviewed and provided background information on the NAHRS, its steering committee and the leadership coming from this Committee. Dr. Bruntz reviewed the organizational structure of the NAHRS group. He showed the map of 2010 participation in the program and will make the push to have all states participate in the program in 2012. Dr. Bruntz reviewed all of the activities for the Committee for 2010-2011 and presented the 2010 NAHRS Annual Report.

Current issues at hand include IT security, continued participation of all states, reporting of equine infectious anemia (EIA) testing by state, work on the NAHRS Operation Manual and reporting criteria for case definitions, and meeting the 2012 reporting needs to OIE and other stakeholders.

Dr. Bruntz then addressed the APHIS-VS response to the 2010 Resolution 6 on the National List of Reportable Animal Diseases (NLRAD). He explained the need to have one national standard for consistent disease reporting. The list and associated case definitions and reporting criteria will provide guidance to state animal health officials, demonstrate to trading partners that the U.S. has a uniform list and assist in meeting international reporting obligations. The list further will help improve zoonotic and endemic animal disease reporting in the United States. This will provide a mechanism for the development and implementation for case criteria and can have procedures for approval, updating those criteria. The NLRAD is designed to complement and supplement existing state and federal lists. Dr. Bruntz reviewed the timeline of action for the NLRAD development and its promotion at USAHA. He reviewed the resolution from 2010 and the VS response. Dr.
Bruntz also reviewed some initial feedback from stakeholders which included ‘completeness’ of reporting, given that specimens might be tested out of state; the need for tribal leader involvement; inclusion of some species like cervids etc. The current target is to get approval for the NLRAD and implementation by 2012.

Dr. Brian McCluskey, USDA-APHIS-VS-CEAH, in his presentation “Epidemiology in Veterinary Services”, gave a review of epidemiology delivery systems and relevance for VS today, considering needs within VS and general budget constraints. He is reviewing the historical basis of epidemiology services within VS for both internal and external customers and how those services are to be delivered. This will be reviewed by Dr. Clifford and senior VS management team for final acceptance.

The Chief Epidemiology position within VS is a senior science position and is formatted to assist VS on epidemiology issues with a focus on standardizing outbreak investigations and associated tasks. This is expected to be a collaborative position within VS as well as outside of VS to include States and other stakeholders.

Two topics were addressed in an hour long discussion moderated by co-chair Dr. François Elvinger, Virginia Tech, engaging the memberships of both AAVLD (about one-third of participants) and USAHA (remaining two-thirds) on questions of diagnostic laboratory data capture and the use of data from validated diagnostic tests.

The first topic “Changes Needed in Diagnostic Laboratory Information Systems and Data Collection to Facilitate Surveillance” first led to a discussion on the capture of peripheral epidemiology data that needs to be captured and flow out in a data stream. The questions centered on the value of such data and its utility in outbreak investigation and surveillance at the local, regional level to national level. The use of such data is difficult because of the various formats that it is entered into a lab information system that is built to support case flow and invoicing, as well as inventory management, but not to support answers on population health status, be it a the individual client, i.e. veterinarian or producer, or at a local/regional or state level. The discussion further led to distinguishing national needs for data, as for participation in NAHLN on currently 9 diseases, from other mostly endemic disease data of importance to producers or individual states only for specific requests, and the potential to assemble data from more than one laboratory. Therefore standards for case definitions, tests definitions, disease ‘designation’, reporting criteria, that would facilitate aggregation of data from multiple cases, premises, and even laboratories. In a comment on Canadian processes, in which a national list of reportable animal diseases has been established a pilot project is ongoing in the Canadian Animal Health Surveillance Network is aggregating data on pre-specified fields with the data being fed daily into the system with owner identification omitted in ‘peace’ times, however available in case of need as in an outbreak. Another
The second topic “Adapting sampling strategies to diagnostic test characteristics and outcome interpretation based on sampling strategy” first led to discussion on validation and validation methods, as well as the standardization of testing. OIE has produced guidelines for validation of molecular based tests. The issue next is to use that validation information for sample size calculation, and following testing, for test result interpretation, either on the individual animal, herd or regional population level. AAVLD and USAHA have organized workshops in the past on test validation as well as sampling strategies, and the possibility of a workshop in the future on sampling strategies and result interpretation was discussed, with the aim at foremost satisfying customer needs.

Committee Business

In the business section the Committee membership presented, seconded and voted on a motion to sunset the National Animal Health Surveillance System (NAHSS) subcommittee of the AHSIS Committee. The Committee had reviewed VS and others’ achievements in implementing the principles and recommendations on surveillance in the 2001 National Animal Health Safeguarding Review and had presented a report at the 2010 AAVLD/USAHA Annual Meeting. As no further activity was requested from the subcommittee the membership voted to sunset the NAHSS subcommittee. The Committee membership further introduced, seconded and accepted by voice vote a resolution on the NLRAD.
The Committee met on October 5, 2011 at the Adam’s Mark Hotel in Buffalo, New York, from 8:00 am until 12:30 pm. There were 57 members and 50 guests present. After the Chair called the meeting to order at 8:03 am, Dr. Steven Halstead, USAHA President, reviewed actions taken by the Board of Directors and Executive Committee on the Committee’s 2010-recommended revisions to its Mission statement. The Chair then introduced the first speaker for the session.

**Toward a New Morality of Animal Welfare**  
J. Bruce Nixon, DVM; Chief of Staff  
Animal Emergency Hospital of North Texas

Summary of presentation: From the way we are educated to the way we live our personal lives, our relationships with animals have changed profoundly. In many state universities and, in particular, land grant universities, agriculture has been a pervasive presence. Agricultural departments have been decreasing in size and influence, and most students now have either no or very little agricultural training. Neither do these students have any personal experience with agriculture as the number of farms has dramatically decreased.

The younger demographic is no stranger to having animals in their lives, however. As food animals retreated from their personal lives, companion animals moved from the pasture to the backyard and ultimately into their bedrooms. Their experiences and opinions about food animals have drifted far from where they were a few decades ago. This mentality is more
fundamentally and deeply established than a mere differing of opinion. Their understanding and approach may actually reflect a substantial and fundamental difference in world view. Differences in what individuals believe to be morally acceptable may be problematic when individual belief systems vary widely.

The industrial revolution introduced the “modern” period where the quality of life of the individual human was greatly improved because of increased cooperation, more efficient means of production, expanded mining of the earth for resources (especially energy), and increased freedom from pernicious labor. Accordingly “stuff” became much more available, pervasive and cheap. Postmodernism is largely a reaction to the assumed certainty of scientific, or objective, efforts to explain reality. In the postmodern understanding, interpretation is everything; reality only comes into being through our interpretations of what the world means to us individually.

Public health, food safety and agricultural production are located in a purely modernist social geography. In contrast, the general public is becoming increasingly postmodern, especially when it comes to questions and concerns about food animal production. This conflict in views has led to an erosion of trust by the public towards those in animal agriculture. Consequently, producers are losing their ability to self-regulate and instead are facing a barrage of new regulations and legislation lobbied for by socially conscious activist groups.

Swine Welfare Issues—Beyond the Stall
John Deen, PhD, DVM, DABVP; Professor, Veterinary Epidemiology
University of Minnesota

Summary of presentation: The improvement of the welfare of pigs is a central focus of swine farmers and veterinarians. It is far from being simple in approaches of dialogue, evaluation and decision-making, and many lessons have been learned as we continue to evaluate diverse concerns such as gestation housing, euthanasia methods, and transportation. However, the challenge is also to create a broader approach that is not only issue-based, but allows a broad evaluation of needs, an efficient allocation of limited resources, and a model of dialogue that develops knowledge and trust.

A useful example is a hospital or health maintenance organization (HMO). Very few of these institutions are really trusted or authority given. Instead it is the people who work inside the institutions who are trusted and expected to make extraordinary decisions regarding the health and well-being of patients. Stock persons have historically been afforded some of the same authority with regard to the health and well-being of animals. Like HMOs, farms (especially large farms) are being vilified as uncaring and profit-driven. Industrialized agriculture is a term that tries to emphasize a lack of regard for outcomes other than profit.

In discussions of welfare, the goal must be to hold onto the ability to control and improve the well-being of animals. The controversies accorded to
gestational housing are indicative of the challenge. We must be able to identify those concerns that are identified by people working with swine and afford them the tools and resources to improve swine welfare or to humanely end pigs’ lives. Concerns such as painful and debilitating diseases must continue to be a major focus in improving the welfare of pigs. Successes in control of disease are also usually successes in improving their well-being, though they have not been celebrated as such.

Poultry Welfare Issues
Patricia Y. “Scotti” Hester, PhD; Professor, Animal Sciences
Purdue University

Summary of presentation: Poultry includes meat-type commercial fowl (turkey and broilers) and laying hens for the production of table eggs. These commercial birds are propagated through secondary breeding stock referred to as turkey breeders, broiler breeders, and layer breeders. Welfare concerns common to all types of poultry include stocking density (overcrowding), air quality (ammonia and dust), litter quality (wet litter), seasonal environmental extremes, euthanasia, handling, depopulation, transport, and slaughter.

For poultry provided with outdoor access, protection from predation and wild bird exposure is germane to maintaining good animal welfare. These welfare issues can be averted through good management, animal caretaker training, and appropriate facility design (Dawkins et al., 2004).

With the exception of broilers, poultry in all types of housing can experience outbreaks of cannibalism and feather pecking. Broiler breeder male aggressiveness during mating can also be problematic. Morphological alterations are performed including beak, toe, and snood trimming to minimize the deleterious effects of these behavioral aberrations. Dubbing in chickens is used to prevent large combs from getting caught on equipment.

Welfare issues specific for broilers and turkeys include long day lengths and metabolic diseases such as ascites, skeletal deformities, sudden death syndrome, and immunosuppression. Feed and water restriction of broiler breeders and male turkey breeders for the purpose of maintaining optimum body weight and high fertility leads to hunger. Fasting molting regimens, which also cause hunger, are used in turkey breeders and broiler breeders when availability of genetic stock is limited.

Laying hens are susceptible to bone breakage because of osteoporosis. An additional welfare issue of laying hens is meeting their behavioral needs of nesting, dust bathing, foraging, and perching without compromising their health or biological function. Enriched colony housing units or furnished cages for laying hens are being evaluated as alternative housing that may be able to meet some of these behavioral needs and still retain some of the advantages of the conventional cage.

Practical Euthanasia of Livestock—A Look at the AVMA Guidelines on Euthanasia Revision

James Reynolds, DVM, MPVM; Professor, Veterinary Medicine
Western University of Health Sciences

Summary of presentation: The American Veterinary Medical Association (AVMA) has nearly completed the review of the AVMA Guidelines on Euthanasia. The final document will be published in the Journal of the AVMA and also will be available online. The AVMA Animal Welfare Committee will be empowered to make minor to moderate changes in the document when new research is available or as issues arise, with the approval of the Executive Board. Also, the Panel of professionals reviewing the Guidelines will continue (rather than being sunset as in the past) so that changes may be made as necessary, making this a “living” document. The presentation included specific details as to which methods were considered “acceptable,” “acceptable with conditions,” and “unacceptable” for a variety of food animal species. It was clarified that “acceptable” methods were equivalent to methods “acceptable with conditions” as long as all conditions were satisfied.

Committee Business

The business meeting followed the last presentation and the presence of a quorum was confirmed. The Chair reviewed the activities of the Committee during and following its 2010 meeting in Minneapolis. The Chair then referred Committee members to the USAHA website to review the 2010 resolutions and the U.S. Department of Agriculture’s (USDA) responses.

As a result of interim actions between annual meetings, the Executive Committee considered the recommendations of the Board of Directors and worked with the Chair to return a modified Mission Statement to the Committee for consideration. Extended discussions gave rise to multiple amendments to that modified Mission with the Committee ultimately approving the following statement:

“The USAHA Committee on Animal Welfare explores and promotes dialogue on issues related to animal use, care, and welfare in search of broad-based animal welfare recommendations. While focused on good animal welfare, the Committee recognizes that an appropriate approach to responsible animal care practices includes due consideration for food security, public health and safety, the environment, and the economic viability of animal agriculture.

The Committee seeks to present information in an honest and unbiased, science-based manner. In this capacity, the Committee serves as a forum for promoting dialogue between various animal welfare groups and industry.”
The Committee met on October 2, 2011 at the Adam’s Mark Hotel, Buffalo, New York, from 12:30 to 3:30 pm. There were 12 members and 18 guests present. The meeting began with a discussion of Committee procedures. The formal Federal response to the 2010 Aquaculture Committee Resolution, “Use of the Lacey Act to Regulate Animal Pathogens” was reviewed. The Committee then considered the following presentations.

Update on the Collaborative Effort to Evaluate VHSV Real Time RT-PCR Assays
Janet Warg
NVSL, USDA-APHIS

In response to the Committee’s previous resolution asking the USDA-APHIS to evaluate real time polymerase chain reaction (PCR) assays for the detection of viral hemorrhagic septicemia virus (VHSV), a VHSV technical working group was formed and worked on the first and second phase of the project in 2010 and 2011. Seven labs were selected to be included in the trial with the first phase involving three labs and the second phase expanding to include seven labs. Four different assays were evaluated and included, 1) an assay developed by Cornell to detect VHSV IVb, 2) an assay developed in Canada by Dr. Garver, 3) an assay developed in Minnesota by Nick Phelps (modified Garver assay that is a single step reaction), and an assay developed by Olesen/Jonstrup in Denmark. VHSV genotypes I, II, III, IVa, IVb and IVb/c were used. The limits of detection for the first phase of the study concluded that 1) the Danish assay had high-medium to high detection for all genotypes, 2) Minnesota and Canadian assay had medium to high detection for all genotypes, 3) the Cornell assay was unable to detect genotype I and had low detection of genotype II. The amplification efficiencies were similar between genotypes, but there was some variation between labs. The Danish and Minnesota assays were selected for further
evaluation and the testing was expanded to all seven laboratories and evaluated the assays for testing on the genotype IV isolates. The testing was evaluated across multiple platforms, software, and laboratories with variable experience levels. Also, the analytical specificity, impact of tissue type on detection and Diagnostic Se/Sp were evaluated. Testing was completed on Sept 9, 2011. Preliminary results showed that the estimates for the limit of detection and analytical specificity for the Danish assay were similar, estimates of intra and inter assay performance within a laboratory and across laboratories appear to be more consistent for the Danish assay, the tissue types did not appear to impact the ability to call a sample positive or negative. Diagnostic tissue panel was distributed to the laboratories. Each panel contained 200 positive samples and 200 negative samples as determined by the current gold standard of virus isolation. The results showed that laboratories having experience with high throughput had higher diagnostic Se and Sp than laboratories with less or no previous experience regardless of the assay method. The percentage of positive or negative correct calls for the Danish assay ranged from 91 to 99%. The percentage of positive and negative correct calls for the Minnesota assay ranged from 81 to 99%. The final data is going to be reviewed by the working group and a final report will be forthcoming.

**National Aquatic Animal Health Plan (NAAHP)**
Dr. Janet Whaley
USDA-APHIS

The NAAHP, developed in collaboration with the National Oceanographic and Atmospheric Administration (NOAA) and the U.S. Fish and Wildlife Service (FWS), was completed and made available for public comment in November, 2008. The original intent was to update the NAAHP every 5 years, therefore will be planning for 2013. Implementation of the NAAHP will be guided by a Federal Advisory Subcommittee under the Secretary’s Advisory Committee on Animal Health (FACA committee)

**Viral Hemorrhagic Septicemia (VHS)**
Dr. Janet Whaley
USDA-APHIS

APHIS will publish the viral hemorrhagic septicemia (VHS) regulation as a proposed rule rather than an interim rule to allow more time for public comment. The rule and supporting economic and environmental assessments are undergoing internal review and APHIS will seek input from the Subcommittee on Aquatic Animal Health (SAAH) on specific issues. The SAAH will provide additional recommendations. Additional discussions with other stakeholders including Tribal groups will be carried out.
Canadian Fish Import Regulations
Dr. Janet Whaley, USDA-APHIS

On December 22, 2010, the Canadian Food Inspection Agency (CFIA) published Canada Gazette, Part II, which changes their Health of Animals Regulations and Reportable Diseases Regulations. The regulation list over 400 species of finfish, mollusks and crustacean species, including live and dead animals for specific end uses. Listed species will require aquatic animal import permits issued by CFIA and zoosanitary certification from the Competent Animal Health Authority in the country of origin. The specific conditions of the import permit and language of the health requirements are still being developed by CFIA. APHIS is working with the National Oceanic and Atmospheric Administraton (NOAA) and Fish and Wildlife Services (FWS) as well as stakeholders to assist Canada in the development of their specific import requirements and language (i.e., permit and zoosanitary conditions) in order to facilitate continuous U.S. trade in aquatic animals and products with Canada.

Training for APHIS Field Veterinary Medical Officers
Dr. Janet Whaley
USDA-APHIS

The roles of the APHIS-VS “Aquaculture Liaisons” include knowing the aquaculture industries in their area, being familiar with all VS regulations, memoranda, and other policies for farmed aquatic animals; being prepared to respond to aquatic animal disease outbreaks or emergencies; conducting facility registrations and lab inspections as requested by stakeholders; acting as a point of contact between APHIS and accredited veterinarians who work in aquaculture. As part of the National Veterinary Accreditation Program, three modules have been developed focusing on Aquaculture and the following website provides a description of the modules (http://www.aphis.usda.gov/animal_health/vet_accreditation/downloads/nvap_modules.pdf). The first module is schedule to be released in October 2011 and the next two in 2012.

Current Status of the National Aquatic Animal Pathogen Testing Network (NAAPTN)
Dr. Jill Rolland
USDA-APHIS

The USAHA/AAVLD draft NAAPTN plan was completed in Sept 2009. The first NAAPTN Steering Committee meeting was in May 2010. The Steering Committee appointed a VHS technical working group that met in June 2010. That group produced a SOP for VHS in July 2010 and it was reviewed by Steering Committee November 2010. The Steering Committee will reconvene at a later time and will fit into the USDA Federal Advisory Committee Act structure under the Subcommittee on Aquatic Animal Health.
Permit Requirements for Shipping Aquatic Animal Pathogens
Dr. Jill Rolland
USDA-APHIS

Dr. Rolland cleared up some confusion about permit requirements. Permits for importation and interstate movement of livestock pathogens are found in 9 CFR §122 where there is broad-based language about permit requirements. However, National Center for Import and Export (NCIE) policy is to permit pathogens for which we have developed specific regulations (i.e. SVC, ISA and VHS). Regulatory options to clarify language in 9 CFR §122 are currently being pursued.

An Introduction to its Fish Health Centers and its Role in U.S. Animal Health
Dr. Joel Bader
U.S. Fish and Wildlife Service (USFWS)

Dr. Bader provided an overview of the USFWS role in aquatic animal health. He then addressed the Committee’s 2010 resolution on the use of the Lacey Act to regulate animal pathogens. In his report briefly summarized the more than 500 public comments received regarding the USFWS request for information regarding the possible listing of amphibians infected by Chytrid fungus as injurious species. The USFWS is currently reviewing those comments and will formulate a response in the coming months.

Committee Business

The Committee received the information presented and was pleased by the Federal response and activity that appears to have resulted from three previous Committee resolutions (Funding for a National Fish Health Laboratory Network, development of a National Aquatic Animal Pathogen Testing Network, and Validation of qPCR for Viral Hemorrhagic Septicemia Surveillance). Committee members were not in favor of putting forth any new recommendations or resolutions. The meeting was adjourned.
The Committee met on October 6, 2011 in Buffalo, New York, from 8:00 a.m. to 10:00 a.m.  Joe Huff acted as Chairman in the absence of Bob Pitts and Jim Wolfram. Mr. Huff welcomed everyone and reviewed the Committee’s Mission Statement, followed by presentations.

APHIS, VS-Center for Veterinary Biologics Update
Dr. Richard Hill, Director
Center of Veterinary Biologics, USDA-APHIS

The Center of Veterinary Biologics (CVB) provided an overview of key APHIS-Veterinary Services (VS), and Center initiatives. VS’ strategic roadmap “VS 2015—A New Perspective” outlines the organizations goals for the future. The primary focus of VS2015 is to enhance the core strengths that have made VS a leader in animal health. The document lays out a refocused vision and mission and the goals that ensure our role as the Nation’s animal health leader for the 21st Century. These goals include more flexible, transparent regulatory frameworks, innovative approaches to animal import and export, new tools for emergency management and expanding services related to One Health and wildlife. In the area of surveillance, VS will continue work on a comprehensive, integrated surveillance system which will include broad-ranging data for analysis, decision making, and generating timelines that address commodity-specific surveillance plans. The new approach for managing Bovine Tuberculosis Programs is continuing. Regulations and requirements are being developed as outlined in the Concept Paper published last year and the feedback from the State/Federal/Tribal Working Group that received input during multiple public meetings. The new facilities at the National Center for Animal Health (NCAH) were briefly discussed. There are still some infrastructure and demolition projects pending for FY 2012. CVB program activities for the first ¾ of fiscal year 2011 were reported. Although the number of licenses issued this year has decreased, most other metrics followed recent trends. Final numbers and metric reports from CVB Inspection and Compliance and CVB Policy, Evaluation and Licensing will be posted to the CVB website at the end
of the fiscal year. The Operational Priorities for the Center FY 2012 focused on business process improvements due to reduced staffing and steady or increasing workload. Included in this initiative are the activities around Single-Tier Label Claims and Electronic Freedom of Information Act (FOIA), finalizing last year’s Laboratory Development Projects related to improving 9 CFR standard requirements, and implementing an electronic system for pharmacovigilance.

NADC, Prion Research Update
Dr. Robert A. Kunkle, Veterinary Medical Officer, Bovine Prion Research USDA-ARS
Topic: Prion diseases of animals research perspectives from the Virus and Prion Diseases of Livestock Research Unit at the NADC.

The National Animal Disease Center (NADC) is one of three USDA centers in the National Centers for Animal Health. As part of the USDA-Agricultural Research Service, NADC is a national resource where roughly half of the ARS animal health research program is conducted with a current Congressional appropriations of $32 million per year. The NADC is made up of 4 research management units consisting of 13 separate research projects directly supported by 46 PhD-level scientists along with 6 additional currently vacant scientific positions. These scientists are supported by a highly skilled and trained technical and animal care support staff, as well as a facilities operation support staff.

In the Transmission, Differentiation, and Pathobiology of Transmissible Spongiform Encephalopathies (TSEs) project much of our research has direct bearing on national surveillance of prion diseases of livestock and wildlife. We have been leading research in assessing the cross-species transmissibility of TSEs, defining differential diagnostic characteristics of prion diseases in unnatural hosts and expanding and refining tools for ante- and postmortem diagnosis.

We discovered a novel prion allele in the 2006 bovine spongiform encephalopathy (BSE) case that is a germline mutation and may represent a genetic form of BSE; research efforts are underway to verify this as a genetic cause of BSE. We recently demonstrated that the H-type BSE associated with the E211K polymorphism is transmissible with a faster incubation time than BSE-H transmitted in cattle of standard genotype and is associated with antemortem retinal thinning and functional deficits of the visual system.

Findings of electroretinogram examinations have established means for ante-mortem diagnosis of TSEs based on retinal accumulation of prions. We have published on methods to detect central nervous system (CNS) tissue contamination on meat and carcasses and to diagnose scrapie-affected sheep post-mortem by fluorescence spectroscopy. Our publications of methods to substitute formalin-fixed-processed tissues for genotyping and
western blot diagnosis of TSEs have expanded post-mortem diagnostic capabilities and created tools for retrospective analyses of TSEs.

Our studies on cross-species transmission of TSEs have delineated species-barriers and relative susceptibilities to the TSE agents, and diagnostic criteria to differentiate TSE strains. Findings from a series of studies reveal it is possible to differentiate BSE in cattle from cattle with experimental intracranial inoculation-transmitted scrapie, CWD or TME of cattle and established that cattle are not susceptible to scrapie or CWD via natural exposure. We have established that raccoons are not susceptible to CWD, fallow deer are relatively resistant to CWD, and white-tailed deer are susceptible to scrapie whereas sheep are relatively resistant to CWD. Preliminary studies also indicate swine are resistant to natural exposure to CWD and scrapie.

The intra-species TSE transmission studies at the NADC have expanded knowledge of the influence of host genetics and prion strain in the clinical course and post-mortem differentiating diagnostic characteristics of scrapie, CWD, and BSE in their natural hosts. Sheep inoculated with scrapie strain x124 develop scrapie rapidly, within four to seven months. Recent findings indicate the Q171K polymorphism in the prion gene of sheep prolongs the incubation period. Sheep with natural genetic resistance to classical scrapie develop the disease after intra-cerebral inoculation, but unlike susceptible sheep do not accumulate PrP\textsuperscript{sc} in the lymphoreticular system. We have corroborated findings of transmission of CWD to white-tailed deer by intravenous inoculation of blood from clinical CWD deer.

Committee Business

Due to the lack of quorum, there were no resolutions or other Committee business. The meeting adjourned at 10:00 a.m.
The Committee met on October 3, 2010 at the Adams Mark Hotel, Buffalo, New York, from 1:00 p.m. to 5:20 p.m. There were 20 members and 17 guests present. The Chairperson and Vice-chairperson, introduced the meeting. There was discussion of the previous year’s resolution that the USAHA support efforts to remove the serotypes of bluetongue virus (BTV) that have been identified since 1998 in the Southeastern United States from the Department of Homeland Security’s select agent list.

An update on Bluetongue in Europe 2011: Vaccines, reassortants and new serotypes
Peter Mertens, Narender Maan, Gillian Pullinger, Kyriaki Nomikou and Sushila Maan
Vector-borne Diseases Programme, Institute for Animal Health, Pirbright Laboratory, UK

Although bluetongue virus is distributed around the world, not all of the 26 serotypes are found in each geographic region. This has led to the proposal that different BTV strains have adapted, in order to be transmitted by their local Culicoides vector species and there may therefore be genetic factors that limit the emergence and spread of ‘exotic’ BTV strains. However recent events have demonstrated that BTV can emerge into new geographic regions, with multiple exotic strains detected in the USA, Australia and for the first time across the whole of Europe.

Sequencing and molecular epidemiology studies have provided evidence for the existence and/or introduction of different BTV strains into Europe, almost every year since 1998, including serotypes 1, 2, 4, 6, 8, 9, 11, 16 and an entirely novel serotype BTV-25. These viruses which belong to both eastern and western topotypes have entered Europe via at least four distinct
routes: from the east into Greece; from North Africa into Italy and the western Mediterranean islands; from Morocco into Iberia, and (via an unknown mechanism) from sub-Saharan Africa directly into northern Europe.

Most of these strains were transmitted and became established in the Mediterranean region where the local distribution of *C. imicola* suggests that it represents the primary vector. Indeed most of the BTV strains that have entered Europe failed to spread out of this zone. However BTV-1, BTV-6 (vaccine strain), BTV-11 (vaccine strain) and most notably BTV-8, which belongs to a western topotype, were all transmitted successfully in northern Europe, beyond the range of *C. imicola*. This indicates the presence of alternative vector species, possibly members of the *C. obsoletus* and *C. pulicaris* groups that are abundant in most of Europe. BTV has recently been isolated from adults of both species suggesting their potential for direct involvement in BTV transmission and highlighting the risk that exists for further spread of BTV into central and northern Europe. BTV-9 also spread to the Balkans, beyond the range of *C. imicola*, but failed to reach northern Europe, suggesting that other vectors, or other environmental, climatic or geographic factors may be involved in the spread of these viruses.

The northern European outbreak caused by BTV-8 was first detected in August 2006 in the Maastricht region of the Netherlands, as a result of clinical signs of the disease in sheep. Subsequent investigations have indicated that it probably started in Belgium a few weeks earlier. The virus also spread at a low level into Germany, northeast France and Luxemburg. The initial source of the infection and its route of arrival into the region are unknown. However, 2006 was the hottest summer on record in northern Europe with temperature in Maastricht up to 6.5 degrees hotter than previously recorded. The outbreak was initially quite mild and was primarily spread in cattle. Belgium only lost approximately 100 sheep to the BTV-8 outbreak in 2006. The BTV-8 virus survived through the winter reappearing from May 2007 onwards in many locations across the region that had been affected in 2006. This was despite the absence of detectable cases of transmission during the winter, and resulted in a continuation of the outbreak that was far more severe than in the first year. During the late summer Belgium alone lost over 20,000 animals killed by the disease (mainly sheep) with case fatality rates of approximately 30%. This represents about 20% of the national flock.

Severe clinical disease was seen in sheep with high levels of case fatalities. Cattle were also affected with a low level of fatalities but more significant losses in productivity, including abortion, stillbirth and teratogenic effects. Most notable of these is the dummy calf syndrome, where development of the cerebral hemispheres was completely inhibited (Wouda et al 2008).

During 2007-2008, approximately 30% of calves born to cows that had been infected with BTV-8 during pregnancy in the UK, were also infected in utero and were PCR positive for BTV at birth. This may provide a possible overwintering mechanism for the virus.
During 2007 the second year of the BTV-8 outbreak in Germany, was over 100 times more severe than in 2006. Massive levels of infection were detected in during the early part of 2008 (with >2033 infected farms), reflecting transmission during the late 2007. However in the later stages of 2008, there was clear evidence for a ‘burn-out’ zone with very few cases, simply because most of the surviving animals were now immune.

There was also an explosion of BT outbreaks in other Northern European countries including the first ever spread of the virus to the UK during August (first detected in September 2007) France reported about 20,000 new farms infected with BTV-8 during 2008 year and about 2000 farms with BTV-1 (mainly in the south-west). There were also 54 animals (eight farms) detected with both BTV-1 and 8 giving an opportunity for the exchange (reassortment) of genome segments, and emergence of novel virus strains, containing genome segments from both parental strains.

There appeared to be about 4 years to the BTV-8 outbreak in Europe: Year 1 - low level initial spread (mainly in cattle), low mortality; Year 2 - high level spread in cattle and sheep very severe, with most deaths occurring in this second year; Year 3 - most animals had been exposed at this stage and had already sero-converted, so there were fewer susceptible animals and fewer cases; Year 4 - fewer sources of infection remain (due to lower levels of infection in year 3) and most animals were still immune. This provides an opportunity for eradication, and perhaps explains why some outbreaks (e.g. those in Greece) had been self-limiting within 4-5 years.

By vaccinating against BTV-8 UK authorities hoped to go directly from the first to the last of these 4 years, without the major losses seen on mainland Europe during ‘year two’. During 2008, vaccination with the inactivated BTV-8 vaccines was completely successful in the UK, with no further insect transmitted cases being detected. Indeed the vaccination campaigns against BTV-8 (and BTV-1) were spectacularly successful across the whole of Northern Europe with France dropping from 38,000 cases in 2008 to 83 in 2009 and only a single case in 2010. Northern Europe now appears to be free of BTV, although vaccination has now largely stopped and there is a high turnover in ruminant animals (approximately 20% per year) which will restore the naïve animal population within a few years. Although the European BTV-8 may be gone from the North, it was also spread to southern European countries and to Israel. Events in Europe highlight the capability of local Culicoides populations to transmit BTV and indicate a risk of further outbreaks.

Although live attenuated vaccines had previously been used to combat multiple BTV types in Southern Europe (as the only vaccines then available) and they had helped prevent clinical disease in the vaccinated animals, these live viruses had also contributed to the genetic pool of BTV in the region, leading to both onward transmission and reassortment with field strains. There is also evidence that the live vaccines could cause a certain level of clinical diseases in fully naïve animals, although experience in the field
suggest that this may be reduced in animals that already have some
immunity to other serotypes.

**Further threats and reassortants**

The outer surface of the BTV capsid is composed of two proteins, VP2 and VP5 (which are encoded by Segments 2 and 6 [Seg-2 and Seg-6] of the BTV genome). These proteins have evolved to escape recognition by host antibodies and are therefore more variable than the other virus proteins. Sequence analysis of Seg-2 / VP2 show that they control BTV serotype and have provided a basis for molecular epidemiology studies, as well as new generations of diagnostic assays by conventional and real-time RT-PCR. 24 distinct clades of Seg-2 were detected that correlate perfectly with virus serotype (Maan S, et al 2008). Molecular comparisons of Seg-2 can therefore be used to identify BTV serotype more rapidly and more accurately than by conventional serological methods. These techniques, which now form the primary diagnostic assays for BTV serotype, were originally used to identify the exotic strains that have spread into Europe and the USA. These studies have also provided a basis for the identification of two novel BTV types: BTV-25 (from goats in the Toggenburg region of Switzerland, and adjoining regions of Germany and Italy) and BTV-26 (from sheep in Kuwait).

BTV-4 has been endemic in Recent Morocco and Spain for several years but unlike BTV-1 failed to spread to northern Europe. However recent reports indicate that recent strains of BTV-4 from Morocco in 2009/2010 have an increased virulence in cattle. Full genome sequence analyses of BTV-1, 4 and 8, show that the latest Moroccan strain of BTV-4 is a reassortant containing only three of the original genome segments from the earlier BTV-4, with the remaining segments from BTV-1 and 8 (both of which had previously spread to northern Europe). It is considered possible that this new strain of BTV-4 may therefore have acquired the ability to spread, and could potential pose as new threat to northern Europe. The ability of these viruses to grow in *Culicoides* vectors is currently being assessed.

**Conclusions**

- The use of inactivated vaccines helped to eradicate BTV-1 and 8 from Northern Europe
- However, once the naïve population has been restored, a future introduction of BTV may cause a new outbreak.
- The use of live vaccines in Southern Europe protected against clinical disease but did not eradicate the virus, contributing to virus transmission and reassortment (new strains)
- Most BTV strains in southern Europe did not spread north (including BTV-4), possible due to an inability to be transmitted by northern European vectors?
- The reassortment of BTV-4 with BTV-1 and BTV-8 in Morocco and Southern Spain has generated new strains that may represent further threats to Northern Europe.
- Better molecular typing assays is identifying new serotypes (including BTV-25 and 26).
The threat to Europe remains from further BTV incursions and outbreaks caused by other orbiviruses and other arboviruses.

Acknowledgements
We wish to acknowledge help from the staff of the Vector-borne Diseases Programme, at IAH Pirbright, particularly: Andrew Shaw, Karin Darpel and Eva Veronesi, as well as many International Colleagues who have provided virus samples and data, particularly Piet van Rijn, Bernd Hoffman and Kris de Clercq, Stephan Zientara for data and samples of the Netherlands, German Belgian and French viruses. We also wish to acknowledge funding from Defra, BBSRC, Wellcome Trust and the European Commission (OrbiVac - Grant no.: 245266; WildTech - Grant no.: 222633-2), EMIDA grant OrbiNet - K1303206.

References

USDA-APHIS Bluetongue Surveillance Activity
Steve Weber
USDA-APHIS, Center for Epidemiology and Animal Health
The U.S. Department of Agriculture has developed a Climate Change Science Plan and encouraged its member agencies to identify approaches to better understand the effects of climate change on natural and managed ecosystems specifically mentioning the surveillance of pests and disease including epidemiological characteristics. The plan also encourages the development of science based information and tools.
APHIS-Veterinary Services (VS) has chosen to analyze existing bluetongue and epizootic hemorrhagic disease (EHD) virus related data to determine if there are climate related factors that are affecting the distribution of those diseases in the United States. We are utilizing a data set that has been aggregated over the last 30 years and have had good cooperation from agencies that have collected the information.
We intend to analyze the distribution of virus/vector as evidenced by positive isolations of blue tongue or EHD virus to determine if temporal distribution trends exist and then utilize various analysis techniques to determine possible associations with climatic or environmental characteristics. The results of the analysis should indicate if sufficient data is available to identify trends or if additional surveillance for disease or vectors is necessary. If sufficient, and associations with climatic and environmental characteristics can be established, recommendations for periodic monitoring of the associated characteristics will be made as an additional method for pre-emptive awareness of the potential for increased spread of these diseases.
Anthropogenic and Metereological Drivers of BTV Infection in California

Christie E. Mayo1, Christopher M. Barker4, Bradley A. Mullens3, Alec C. Gerry3, Peter P. C. Mertens6, Sushila Maan6, Narender Maan6, Ian A. Gardner2, Alan J. Guthrie5, N. James MacLachlan1

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2 Department of Medicine and Epidemiology, School of Veterinary Medicine, University of California, Davis, California
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6 Vector-borne Diseases Programme, Institute for Animal Health, Ash Road Pirbright, Working Surrey, UK

Bluetongue is an economically important arboviral disease of ruminants that is transmitted by hematophagous Culicoides midges. In light of dramatic recent changes in the global distribution of bluetongue virus (BTV), the goals of this study were to re-evaluate the prevalence of BTV infection of cattle, abundance of Culicoides midges, and BTV infection rates of Culicoides midges on individual dairy farms in California. A serosurvey of adult dairy cattle confirmed that BTV infection is prevalent throughout much of the state, although the coastal northwestern region remains free of infection and prevalence varies markedly among farms in the remainder of the state. Intensive entomological sampling was performed for one year on four farms in the northern Central Valley of California using three trapping methods (CO2 traps with UV light, CO2 traps without UV light, animal baited aspirations). The entomological surveillance showed that the abundance of Culicoides midges was markedly different and coincided with the prevalence of BTV infection of sentinel cattle on each farm. Mean maximum and minimum temperatures and other meteorological parameters were similar on all four farms, thus we speculate that particular management practices were responsible for both the increased midge abundance and prevalence of BTV infection of cattle at individual farms. Specifically, it is concluded that variation in vector abundance at individual farms most likely is the result of lagoon waste-water and irrigation management practices, leading to higher BTV infection rates among livestock held on farms with more waste-water lagoons and greater acreage of land for waste-water application.

The second portion of this project was to examine the seasonal BTV infection rates of C. sonorensis midges to develop estimates of risk for BTV transmission to sentinel cattle at each farm. BTV infection rates were remarkably lower amongst female C. sonorensis midges collected by CO2 traps with UV light than among midges collected by either animal- baited aspirations or in CO2 traps without light. Analysis of BTV-infected midges
using serotype-specific quantitative reverse-transcriptase polymerase chain reaction (qRT-PCR) assays confirmed that BTV serotypes 10, 11, 13 and 17 are all present in the region, but that midge infection rates and the number of BTV serotypes circulating differed markedly among individual farms. Furthermore, more serotypes of BTV were present in midges than sentinel cattle at individual farms where BTV circulated, and the virus was detected at each farm in midges before it was detected in cattle. Findings from this study confirm the importance of using sensitive surveillance methods for both midge collection and virus detection in epidemiological studies of BTV infection, which is especially critical if the data are to be used for development of mathematical models to predict the occurrence of BTV infection of livestock.

**Improving Surveillance of *Culicoides sonorensis* with More efficient Light Traps**

Lee W. Cohnstaedt and Darren Snyder

USDA, ARS, Arthropod-Borne Animal Diseases Unit

In North America, *Culicoides sonorensis* is thought to be the main disease vector of Bluetongue and Epizootic hemorrhagic disease viruses. Surveillance for *Culicoides* is predominantly conducted with light traps baited with carbon dioxide and ultraviolet light. However, laboratory studies have not been conducted to determine the optimal wavelength or color of light that is maximally attractive. *Culicoides sonorensis* photo attraction was evaluated using a cloverleaf arena illuminated by visible and ultraviolet light from LEDs. Light intensities were equalized for red, green, blue and ultraviolet LEDs before testing. More *Culicoides* were attracted to the UV light than the other three colors, which confirmed field experiments, and past *Culicoides* trapping experience. However, these experiments also reviled interesting perturbations to the UV attractions trend based on narrow UV wavelength analysis, unequal light intensities, and insect physiological state. In summary, ultraviolet light is maximally attractive to *Culicoides* and remains the best visual attractant in light traps for surveillance and insect monitoring purposes.

**Whole Genome Sequence Analysis of Field Strains of Bluetongue Virus**

Bill Wilson¹, Dane Jaspersøn¹, Mark Harpster², Patrick Johnson², Donna Johnson³, Eileen Ostlund³, Raymond Lennhoff⁴, Pejman Naraghi-Arani⁴, Mark Ruder⁵, Andrew Allison⁵, David Stallknecht⁵, and Timonthy Smith⁶

¹USDA, ARS, Arthropod-Borne Animal Diseases Unit, Manhattan, KS
²Department of Chemical and Petroleum Engineering, Univ. of WY, Laramie, WY
³Lawrence Livermore National Laboratory, Livermore, CA
⁴Southeastern Cooperative Wildlife Disease Study (SCWDS), University of Georgia, Athens, GA
The Arthropod-Borne Animal Diseases Research Unit (ABADRU) has adapted the published single primer ligation - whole genome amplification protocol that allows the whole bluetongue and epizootic hemorrhagic disease virus genome to be amplified without prior sequence knowledge and submitted to high-throughput DNA sequencing. This technology was applied to bluetongue virus serotype 3 isolates from Florida, Arkansas, Mississippi, Central American and the Caribbean basin. Although the dataset is not complete the analysis is consistent with hypothesis that these viruses were introduced from the Central America and the Caribbean basin. There was also evidence of gene reassortment among U.S. serotypes with the newly introduced virus serotypes. At this time, the newly introduce serotypes of Bluetongue have been isolate only in the South Eastern United States.

Increased Incidence of EHDV in Texas
Alfonso Clavijo
Texas Veterinary Medical Diagnostic Laboratory

Texas' current drought is the most severe one-year drought on record. August 2011 was the hottest month in Texas history. The average temperature was 88.1 F (31.2 C), breaking the previous record of 87.1 F (30.6 C) set the month before. In San Angelo, Texas, the record for warmest month was set three times in three months from June to August, according to the National Weather Service. June to August was the driest summer on record, with only 2.44 inches of precipitation. The Epizootic Hemorrhagic Disease (EHD) cases from 2009 consisted of the three circulating serotypes of the virus 1, 2, and 6 as determined by RT-PCR. In 2010 and 2011 an increase in EHD cases have been confirmed as EHD.

Pathogenesis of BTV-8 in White-tailed Deer
Barbara S. Drolet1, Lindsey M. Reister1, James O. Mecham1, William C. Wilson1, Pauline Nol2, Kurt C. VerCauteren2, Tara C. Ruby2, Piet A. van Rijn3, Richard A. Bowen4

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3Central Veterinary Institute of Wageningen UR, Lelystad, The Netherlands
4Colorado State University, Fort Collins, CO

World-wide there are at least 26 serotypes of bluetongue virus (BTV), a complex non-enveloped virus in the family Reoviridae, genus Orbivirus. Bluetongue (BT) is an arthropod-borne disease of cattle, sheep, goats, and deer and is transmitted by Culicoides biting midges. In 2006, bluetongue serotype 8 (BTV-8) invaded north-western Europe resulting in the largest BT outbreak ever recorded. This BTV strain differs from other BTV strains in many aspects; competent vector(s), transplacental and oral transmission,
and severity in cattle. In the U.S., white-tailed deer (*Odocoileus virginianus*) are the sentinel wildlife species for re-emerging BT outbreaks of our domestic serotypes (BTV-2, 10, 11, 13, 17). To determine their susceptibility to the European strain of BTV-8 BTV-seronegative deer were inoculated with IAH-collection BTV-8 NET2007/01. Two deer were sham inoculated to serve as uninfected controls and housed with infected animals to verify the inability of this virus to spread by direct contact transmission. Body temperatures and clinical signs were recorded daily. Peak clinical disease was seen between 8-15 days post inoculation and included fever, upper and lower respiratory distress, swelling of the tongue and face, oronasal discharge, loss of appetite, lethargy, depression, loss of balance and death. Periodic blood samples, as tested for BTV ribonucleic acid (RNA) by real time PCR, were positive by as early as day 3, peaking from 8-12 days, and persisting for up to 28 days when the study was ended. Serum samples, as tested for BTV antibodies by competitive ELISA, showed antibody responses as early as day 8, peaking between 12-21 days with high antibody titers for the duration of the experiment. At the time of necropsy, gross pathology included petechial hemorrhages of the liver, intestinal hemorrhages, and indications of bacterial pneumonia in the lungs. Necropsy tissue samples as tested by real time PCR for BTV RNA, showed a widely disseminated infection including liver, spleen, kidney, adrenal gland, mandibular and mesenteric lymph nodes, lung, heart, and intestine. Results suggest that if BTV-8 is accidentally or intentionally introduced into the U.S., our white-tailed deer would be very susceptible and would serve as significant virus amplifying hosts for subsequent insect transmission to livestock.

**USDA-APHIS-VS National Veterinary Services Laboratories**

**Bluetongue Virus (BTV) and Epizootic Hemorrhagic Disease Virus (EHDV) Isolations/PCR Positives**

**Calendar year 2010**

Bluetongue virus or RNA was detected in 11 samples submitted during calendar year 2010. The positive bluetongue virus isolation and polymerase chain reaction (PCR) test results from submissions to the National Veterinary Services Laboratories (NVSL) in 2010 are listed in Table 1.

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<th>VI</th>
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<tbody>
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<td>4</td>
<td>Cattle</td>
<td>Positive</td>
<td>BTV-10</td>
</tr>
<tr>
<td>CA</td>
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<td>Positive</td>
<td>BTV-11</td>
</tr>
<tr>
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<tr>
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<td>1</td>
<td>Deer (SCWDS*)</td>
<td></td>
<td>BTV-12</td>
</tr>
</tbody>
</table>

*Southeastern Cooperative Wildlife Disease Study, Athens, GA*
REPORT OF THE COMMITTEE

During calendar year 2010, four samples tested positive for EHDV by virus isolation and/or PCR. The positive EHDV isolation and PCR test results from submissions to the National Veterinary Services Laboratories (NVSL) in 2010 are listed in Table 2.

Table 2. EHDV isolation (VI)/ PCR positives, Calendar year 2010

<table>
<thead>
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<th>VI</th>
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</thead>
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<td>EHDV-2</td>
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<td>EHDV-2</td>
</tr>
<tr>
<td>MO</td>
<td>1</td>
<td>Deer</td>
<td>Positive</td>
<td>EHDV-2</td>
</tr>
</tbody>
</table>

Calendar year 2011 (January 1– September 27)

As of 27 September 2011 bluetongue virus has been identified in two samples: BTV-17 was isolated from a cattle blood sample from California and BTV-11 was isolated from North Carolina deer tissue. In the same time period, EHDV-2 was isolated from nine deer tissue samples from the following: Washington DC, Florida (2), North Carolina (2), New York (2), Oklahoma, and South Dakota. EHDV-6 was isolated from one South Dakota deer. EHDV has also been identified by RT-PCR in one additional Florida deer (virus not isolated), two additional North Carolina deer (virus isolation in progress), and one additional New York deer (autolyzed tissue, no virus isolation).

2011 Bluetongue Serology Proficiency Test

Fifty-two laboratories participated in the 2011 bluetongue (BT) proficiency test. The panel consisted of 20 ruminant serum samples. The passing score was zero or one sample missed. Of the 52 laboratories participating in the 2011 BT proficiency test, 50 agreed with each other and with NVSL on the positive/negative bluetongue antibody status of all 20 samples. Two laboratories missed one sample. Laboratories approved to conduct official (export) bluetongue serology are listed on the website: http://www.aphis.usda.gov/animal_health/lab_info_services/approved_labs.shtml

SCWDS Update: Hemorrhagic Disease and Culicoides sp. Surveillance

Mark Ruder, Joseph Corn, Daniel Mead, and David Stallknecht
Southeastern Cooperative Wildlife Disease Study (SCWDS), University of Georgia

An overview of epizootic hemorrhagic disease viruses (EHDV) and bluetongue viruses (BTV) isolated by SCWDS during the 2010 and 2011 transmission seasons was presented. During 2010, 14 viruses were isolated
from the 85 virus isolation attempts made, representing 21 states and 7 species (59 white-tailed deer, 19 mule deer, 1 key deer, 3 elk, 1 unknown cervid, 1 cow, and 1 sheep). Table 1 lists virus isolates.

During the summer and early fall of 2011, SCWDS has received numerous reports of suspected hemorrhagic disease in free-ranging white-tailed deer populations. As of September 30, 2011, there have been 37 viruses isolated after 84 virus isolation attempts, representing 19 states and multiple species (76 white-tailed deer, four mule deer, two elk, and two unknown cervids). Table 2 lists the viruses isolated thus far in 2011.

In addition, an update on surveys for Culicoides species in the Southeastern United States was provided. These surveys have been conducted since 2007 as part of a Cooperative Agreement for Exotic Arthropod Surveillance with USDA-APHIS-VS. Surveys have been conducted in Florida, Georgia, Alabama, Mississippi, Louisiana, Arkansas, and Texas. Survey sites in Arkansas, Mississippi, Florida, and Texas included premises where historically non-endemic BTV or EHDV serotypes had previously been detected. Contents of light traps are processed and Culicoides sp. identified at SCWDS. During November 2007 – September 2011, traps were set for 4,456 trap nights at 224 premises in 111 counties throughout the Southeastern U.S. A total of 145,121 Culicoides biting midges have been recovered from the traps, with 49 species identified to date. Exotic Culicoides sp. have not been identified, but identification of most of the insects collected is pending. Possible range expansions of C. insignis and C. alachua have been detected. Presently, field collections and identification of Culicoides sp. collected are underway in Alabama, Florida, and Mississippi and will continue at these locations in 2012.
Table 1: A list of the 14 viruses isolated from a total of 85 individual animal submissions made to SCWDS during 2011.

<table>
<thead>
<tr>
<th>STATE</th>
<th>COUNTY</th>
<th>MONTH</th>
<th>SPECIES</th>
<th>VIRUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALABAMA</td>
<td>Geneva</td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Covington</td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nov.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>ARKANSAS</td>
<td>Jefferson</td>
<td>Aug.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-6</td>
</tr>
<tr>
<td>FLORIDA</td>
<td>Lee</td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>BTV-12</td>
</tr>
<tr>
<td></td>
<td>Dixie</td>
<td>Sep.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>MARYLAND</td>
<td>Anne Arundel</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>NEW JERSEY</td>
<td>Salem</td>
<td>Sep.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>NEW MEXICO</td>
<td>Torrance</td>
<td>Oct.</td>
<td>elk&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Torrance</td>
<td>Sep.</td>
<td>elk&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>NORTH CAROLINA</td>
<td>Person</td>
<td>Sep.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
</tbody>
</table>

<sup>c</sup> captive animal

WTD = white-tailed deer

The Arthropod-borne Animal Diseases Unit: Research Program Update and Current Status

Dr. D. Scott McVey
USDA, ARS, Arthropod Borne Animal Diseases Unit

To accomplish the continuing research mission of the Arthropod Borne Animal Diseases Unit (ABADRU) in solving major endemic, emerging, and exotic arthropod-borne disease problems in livestock, the Unit has completed the move to Manhattan, Kansas. The ABADRU is one of five units at the Center for Grain and Animal Health Research (CGAHR). The ABADRU is doing BSL-2 research at CGAHR and has operational cell culture and insectary laboratory units at the Center. The ABADRU has also begun BSL-3 laboratory and animal work at the new Biosecurity Research Institute at Kansas State University. An insect-secure laboratory will be available for animal research projects late in 2011. The ABADRU has three 5-year project plans under two ARS National Research Programs; Animal Health NP103 and Veterinary, Medical, and Urban Entomology NP 104. These plans include research on bluetongue virus (BTV; exotic and domestic), vesicular
stomatitis virus (VSV), and Rift Valley fever virus (RVFV). Research progress to date for exotic BTV include a susceptibility study of white-tailed deer with BTV serotype 8 isolate originally isolated in The Netherlands. Research progress to date for RVFV includes vector competence studies, animal infection model studies, production of BSL-2 diagnostic assays including qRT-PCR, ELISA, and immunohistochemistry. The ABADRU has recruited a new research leader and veterinary medical officer (Dr. D.S. McVey), a new field entomologist (Dr. L. Cohnstaedt), a new Molecular Entomologist (Dr. D. Nayduch) and is recruiting an additional veterinary medical officer. The ABADRU continues to have the highest level of funding in its history, thanks to additional funding sources such as Department of Homeland Security, ARS Office of International Research Projects, and the Department of State Biosecurity Engagement Program. Additionally, the lab has the largest number of national and international collaborations in its history.

Committee Business
The Committee did not propose any new resolutions for this year. The Committee recommended an update to their mission statement, to replace “bovine retrovirus” with “related viruses of livestock.” The revised statement reads as follows:

“The purpose of the Committee on Bluetongue and Related Orbiviruses is to assemble scientific data on bluetongue and related viruses of livestock that can be formulated into recommendations for national and international regulatory policies.”
REPORT OF THE COMMITTEE ON BRUCELLOSIS

Chair: Jim Logan, WY
Vice Chairs: Bill Barton, ID; Tony Frazier, AL

John Adams, VA; J Lee Alley, AL; Neil Anderson, MT; George Badley, AR; Joe Baker, NM; Eric Barlow, WY; Claude Barton, TN; Bill Barton, ID; John Belfrage, CO; C. Black, GA; Nathan Boehm, ND; Richard Breitmeyer, CA; Becky Brewer-Walker, AR; Beth Carlson, ND; Michael Coe, UT; Thomas Conner, OH; Walter Cook, WY; Donald Davis, TX; Leah Dorman, OH; Mark Drew, ID; Anita Edmondson, CA; Robert Ehlenfeldt, WI; Philip Elzer, LA; Steven England, NM; Donald Evans, KS; Dave Fly, NM; James Foppoli, HI; Tony Frazier, AL; Francis Galey, WY; Tam Garland, TX; Robert Gerlach, AK; Arnold Gertonson, CO; Michael Gilsdorf, MD; Linda Glaser, MN; Jose Alfredo Gutierrez, MEX; Rod Hall, OK; Beth Harris, IA; William Hartmann, MN; Greg Hawkins, TX; Burke Healey, CO; Carl Heckendorf, CO; Bob Hillman, ID; Sam Holland, SD; Dennis Hughes, NE; David Hunter, MT; Pamela Luisa Ibarra, MEX; Jon Johnson, TX; Susan Keller, ND; Bruce King, UT; Terry Kreeger, WY; Carolyn Laughlin, OH; Steve Laughlin, OH; John Lawrence, ME; Maxwell Lea, Jr., LA; Thomas F.T. Linfield, MT; Eric Liska, MT; Jim Logan, WY; Laurent O'Gene Lollis, FL; Christian Mackay, MT; Bret Marsh, IN; Barbara Martin, IA; Chuck Massengill, MO; Leslie McFarlane, UT; Paul McGraw, WI; Ernie Morales, TX; Henry Moreau, LA; Sherrie Nash, MT; Dustin Oedekoven, SD; Steven Olsen, IA; Elizabeth Parker, DC; Janet Payeur, IA; William Pittenger, MO; Glenn Plumb, WY; Dale Preston, TX; Valerie Ragan, VA; Tom Ray, NC; Sebastian Reist, NJ; Nancy Robinson, MO; Keith Roehr, CO; Thomas Roffe, MT; Shawn Schafer, ND; David Schmitt, IA; Brant Schumaker, WY; Andy Schwartz, TX; Charly Seale, TX; Daryl Simon, MN; Marilyn Simunich, ID; Fred Stevens, CA; Robert Stout, KY; Nick Striegel, CO; Paul Sundberg, IA; Seth Swafford, MO; George Teagarden, KS; Lee Ann Thomas, MD; Kenneth Throlson, ND; James Watson, MS; Diana Whipple, IA; Margaret Wild, CO; Richard Willer, HI; Larry Williams, NE; Kyle Wilson, TN; James Wolfram, FL; Taylor Woods, MO; Ching-Ching Wu, IN; Marty Zaluski, MT; Glen Zebarth, MN.

The Committee met on Monday, October 3, 2011 at the Adam’s Mark Hotel, Buffalo, New York, from 1:00 to 6:00 p.m. There were 43 members and 32 guests present. Introductions of Vice-Chairs and Subcommittee Chairs were made. An overview of the 2010 meeting and resolutions were given.

Presentations and Reports

Dr. Walt Cook presented the Scientific Advisory Subcommittee Report, which is included at the end of this report.
BRUCELLOSIS

Dr. Carter Black presented the Feral Swine Subcommittee Report, which is included at the end of this report.

Dr. Marty Zaluski presented the Greater Yellowstone Area (GYA) Subcommittee Report, which is included at the end of this report.

Moving Forward with the Brucellosis Eradication Program
Dr. Mike Carter
USDA-APHIS-VS

A summary of this presentation on Tuberculosis/Brucellosis Working Group; National Brucellosis Program Update; Brucellosis Slaughter Surveillance; and Interim/Final Rule is included at the end of this report.

Montana Review
Dr. Marty Zaluski
Montana State Veterinarian

On September 23, the National Veterinary Services Laboratory (NVSL) notified Montana Department of Labor (MDOL) that a *Brucella abortus* biovar 1 was isolated from a cattle herd located in the Designated Surveillance Area (DSA) in Park County. This is the fourth Montana Brucellosis affected herd (cattle or domestic bison). Approximately 10 adjacent/contact producers with approximately 2,500 test eligible cattle have been identified. While it’s too early to speculate on the source of exposure, the affected premises are not within the bison seasonal tolerance zone, while elk Brucellosis in this area is well-established.

Montana made two changes to DSA regulations this year. First, Montana now requires permanent, official identification on any sexually intact cattle leaving the DSA. This helps with traceability of animals that have a low chance of being exposed to Brucellosis. Second, the boundary of the DSA has been adjusted to include an area where Brucellosis in wild elk has been recently documented. This recent adjustment increases the size of Montana’s DSA to 4% of the state. All livestock operations within the DSA are required to calfhood vaccinate, and Brucellosis test sexually intact livestock 12 months of age or older, prior to being sold or being removed from the DSA. Any variances to these requirements must be done through a herd plan.

Idaho Review
Dr. Bill Barton
Idaho State Veterinarian

A portion of the Brucellosis affected herd identified in late 2009 remains under quarantine pending a release test to be completed in late Fall 2011. Ninety-seven (97) head of fall calving cows remain under quarantine. They were last tested in April 2011 and were all test negative for Brucellosis. They will be retested following calving this fall and if all are test negative, the quarantine will be released. An assurance test will be completed a year from
the date of release from quarantine. One hundred eight (108) head of 2010 heifer calves that had also been under quarantine were spayed in June 2011 and released from quarantine.

On May 1, 2011, the Idaho State Department of Agriculture (ISDA) implemented a temporary rule requiring change of ownership and movement testing of intact cattle 18 months of age and older that leave Idaho’s Designated Surveillance Area (DSA). The rule applies to all intact cattle 18 months of age and older that have been within the DSA at any time between January 1 and July 1 of the calendar year. These animals must be tested negative for Brucellosis within 30 days prior to movement unless sent to an approved Idaho livestock market or federally approved slaughter facility that will test for Brucellosis on arrival. Idaho State Brand Inspectors are assisting with enforcement of the testing requirements.

The rule also requires that all cattle and domestic bison, regardless of age, that leave the DSA must be identified with official individual identification.

Upon approval by the 2012 Idaho Legislature, these temporary rule changes will become permanent.

The ISDA, in cooperation with the Idaho Department of Fish and Game, and Idaho’s cattle producers, continues to work to prevent commingling of cattle with potentially infected wildlife. Several cattle winter feeding areas have been fenced to prevent elk from accessing the feed lines and more projects are planned in the near future. Individual producer herd plans are updated on a regular basis to ensure that appropriate risk mitigation measures are being utilized.

Wyoming Review
Dr. Jim Logan
Wyoming State Veterinarian

Wyoming has found one new affected herd in Park County in the vicinity of our three (3) most recent cases (2 in late 2010 and 1 in February 2011). The three (3) earlier cases are all known to be caused by transmission from infected wild elk and it is expected that this most recent case will be as well. These cases are not epidemiologically linked except through the elk.

The Wyoming Livestock Board (WLSB) expanded the boundaries of the Designated Surveillance Area (DSA) in April 2011 to include areas adjacent to the previously established boundaries. The expansion was due to an increased seroprevalence in elk in Park and northwestern Hot Springs counties and due to reports of elk/cattle commingling in southern Lincoln county and the need for additional surveillance in these areas.

Wyoming requires calfhood vaccination statewide and all sexually intact female cattle that inhabit the DSA must be calfhood or adult vaccinated. From July 1, 2010 to June 30, 2011, 194,275 head of cattle were vaccinated. The WLSB also has a statewide identification requirement whereby all sexually intact female cattle 12 months of age and over must be officially identified prior to any change of ownership. Additionally, all sexually intact
female cattle regardless of age that are in the DSA at any time must be officially identified prior to moving from the DSA.

All female cattle from the Wyoming DSA sold for breeding purposes (regardless of age) and all females over 18 months of age are required to be tested within 30 days prior to change of ownership, movement from the DSA, and interstate movement. Between July 1, 2010, through June 30, 2011, 41,838 animals were tested. Of that number, 32 reactor animals were found in three (3) separate herds through this required testing. We expect to find occasional cases of Brucellosis among our cattle herds as long as there is a wildlife reservoir of the disease in our state. Our test and identification requirements provide good surveillance, traceability, and early detection. The WLSB Brucellosis requirements are well enforced through brand inspection since any change of ownership or inter-county and interstate movements must include a brand inspection clearance.

APHIS has approved Wyoming’s Brucellosis Management Area plan.

Depopulation Matrix Draft
Dr. Mike Gilsdorf
National Association of Federal Veterinarians

Information was presented on a draft depopulation matrix for Brucellosis that would address availability of funds, risk factors, seroprevalence rate in the herd, presence of abortions or infertility, and source of infection as factors to consider in determining whether depopulation should occur.

Texas’ Loss of First Point Testing
Dr. Dee Ellis
Texas State Veterinarian

In 2011 Texas found one confirmed case of *Brucella abortus* in a small cattle herd in deep South Texas. The herd was tested and all trace-ins and trace-outs were completed with no known source detected, and no further spread found. The herd was subsequently depopulated. The herd infection was originally detected by first point testing at a sale barn.

A second herd located in far west Texas disclosed in 2011 was also thought to be infected based upon the epidemiology investigation, however culture was not confirmed. The positive animal was also detected through first point testing at a market. Upon investigation it was determined the cattle were pastured primarily in Mexico. The reactor animal was not vaccinated, and there is little chance of any feral swine exposure. A small number of the herd was tested negative on multiple occasions, but the remainder of the herd continues to pasture on the Mexico side of the Rio Grande. Herds located in remote areas of west Texas along the Rio Grande River continue to pose a disease threat to the Texas livestock industry due to the ease in which they can move between Mexico and Texas.

Texas is in the third year of five as a “high risk” state for Brucellosis following receiving “free” status from USDA. Although USDA had committed
federal funds to continue to support first point testing for the full five years as a high risk state, because of severe reductions in state funds the Texas Animal Health Commission (TAHC) stopped enforcement of change of ownership testing on August 1, effectively stopping first point testing at markets. Texas historically tested about 1 million adult cattle per year.

Approximately one third of the sale barns in Texas have continued to voluntarily test and/or tag animals. TAHC has rule making underway to require continued tagging of adult cattle, but there are no plans to reconsider the stoppage of testing at markets. TAHC will continue to encourage voluntary testing and tagging of cattle at markets, and will continue to actively investigate all Brucellosis suspect cases found through other surveillance streams.

Consortium for the Advancement of Brucellosis Science
Dr. Walt Cook
University of Wyoming

Background: In 2005 an international group of scientists met in Laramie, Wyoming, to examine the needs for Brucellosis vaccines, vaccine delivery and diagnostics, and make recommendations for their research and development. The “Laramie Agenda” determined that it would take a minimum of $10 million and 10 years to accomplish the above; and they further recommended the development of a consortium to oversee this research and development.

Based on this recommendation, the Consortium for the Advancement of Brucellosis Science (CABS) was formed and was designed after USDA National Institute of Food and Agriculture (NIFA) Coordinated Agricultural Project (CAP) grants as the hope was that CABS would be able to apply for a CAP grant. The USAHA and Dr. John Clifford and others have recommended to NIFA that Brucellosis be included as a potential CAP project. This would not guarantee that a Brucellosis consortium would obtain funding, nor would it guarantee funding for CABS even if Brucellosis were funded, it would simply allow us to compete. To date, no progress for Brucellosis in the CAP program has been made.

Because we do not seem to be making progress with NIFA, CABS is now pursuing funding through an amendment to the Farm Bill. We have been working with legislators to develop draft language for an amendment that would support research consortia for bovine Brucellosis, bovine tuberculosis, and other zoonotic diseases shared by wildlife and livestock.

We are also pursuing potential private or foundation sources of funding. We recognize that we may not be able to obtain the full $20 million from these sources, so we have broken the research needs into separate phases that could be individually supported (or partially supported). Some foundations are more interested in international disease issues; additionally private companies see a limited USA market but large international market. For this reason, we are considering expanding CABS to also address
international Brucellosis issues. We still have several issues to investigate before deciding whether to pursue this expansion.

**Mexico Brucellosis Update**  
Dr. Jose Alfredo Gutierrez  
CGRPA, Mexico

The national program of eradication of Brucellosis in animals is regulated by the Federal law on Animal Health and the standard official Mexican 041 "National campaign against Brucellosis in animals", regulation which is currently changing.

The budget of the national program of eradication is nearly $10 million annually and is aimed at achieving the recognition of regions of low prevalence in cattle, bovine and goats, based on strategies of active and passive surveillance in Sera, monitoring of tanks of milk, surveillance in herds with reproductive problems and abortions, and an outline of test and elimination of positive animals. The program also provides for a significant increase in vaccination against *Brucella melitensis*.

Currently Mexico boasts the North of the State of Sonora recognized as free and region in search of be recognized first of all with the classification of "Class A" by the USDA APHIS. Also southern regions of Sonora, Guerrero coast, "A" of Campeche and Yucatán and Baja California Sur States are recognized in a stage of eradication.

After the year 2011 the State of Quintana Roo and the regions "A" of the States of Guanajuato, Chiapas and Jalisco will fail its entry to the status of eradication.

**Committee Business:**

Four (4) resolutions were brought before the Committee.

The GYA Subcommittee brought the following two (2) resolutions:

- A request for assistance from the Centers for Epidemiology and Animal Health to establish a depopulation decision matrix; and
- Reporting on trace investigations of suspect animals.

The Scientific Advisory Subcommittee brought the following two (2) resolutions:

- The use of Buffered Acidified Plate Antigen (BAPA) and Florescent Polarization Assay (FPA) tests for cervids; and
- RB51 calfhood vaccination of bison up to 24 months of age.

All four resolutions passed unanimously.
The Subcommittee met by conference call on September 27, 2011.
Members present: Jack Rhyan, CO; Valerie Ragan, MD; Don Evans, KS; Phil Elzer, LA; and Walt Cook, WY.
Members absent: Don Davis, TX; and Steve Olsen, IA.

Discussions:

a. Western Blot Use in Cervids

As of today there is no FORMAL charge for the subcommittee to make a suggestion on the use of the Western Blot system. For the past six years there have been numerous discussions relative to the use of the test.

Jack Rhyan and Pauline Nol did an experiment where they injected elk with killed preparations of Brucella and Yersinia. The sera from these animals was sent to three different laboratories and the Western Blot assay was used to monitor the animals immune responses. Jack will review the data and he will get back to the subcommittee with his findings. Phil Elzer noted that the work was done on experimentally injected elk not hunter-killed samples of which can be problematic in themselves. Wyoming also did a project on elk experimentally infected. That data has been submitted to the committee for review via Mark Drew. The data will be compiled and will be discussed on a later call.

Data evaluated up to this point does not support the use of the Western Blot as a diagnostic test for brucellosis in cervids. For the Western Blot test to be considered an official test it would have to pass with all the vigor as all the other tests for brucellosis. Due to difficulties with running the test (time, antigen supply, interpretations, and early data results) there has been no push to make this an official brucellosis test.

b. Resolution on Approval of Calfhood Vaccination of Bison Up to 24 Months of Age

There was some confusion as to the status on the recommendation to USDA-APHIS-VS for approval of calfhood vaccination of bison up to 24 months of age that had been discussed in 2009 by the subcommittee. The intent of the committee was to recommend that USDA-APHIS-VS approve the use of calfhood vaccination of bison up to 24 months of age due to the later maturity of bison. A letter was found dated May 25, 2010, to USDA-APHIS-VS regarding the recommendation. Dr. Elzer will follow up with APHIS on the status as a follow up to the recommendation. This information was passed on to Dave Hunter (he asked for the resolution) and Deb Donch for review. Deb passed on the information to Arnold Gertonson.

Since an official response to the recommendation letter has not been received, a resolution recommending the change will be submitted to the full Committee on brucellosis as recommended by Dr. Logan.
c. The Use of PCR for the Diagnosis of Brucella Abortus Infection

There is interest in the possible use of PCR in the diagnosis of brucellosis. The comment was made that results of Betsy Bricker’s PCR techniques were not reproducible, therefore PCR is not a good diagnostic technique as of yet.

PCR is good in speciation, but didn't work well with tissues or milk. It works well with pure culture, but is not a good diagnostic tool. There is not a good PCR test available currently for use in the diagnosis of brucellosis. PCR only works well if DNA is present. At this time, the data does not support the use of PCR as a diagnostic tool. There is a lot of extrapolation of the use of PCR as a diagnostic tool, but the work has been done on spiked samples, not on clinical samples. It is requested that if anyone on the Committee on Brucellosis has additional data on the PCR test that they would like the brucellosis scientific subcommittee to evaluate, then please send the data in.

d. Adult Vaccination and Possible Titers to CF and FPA

The question has been raised as to whether adult vaccination with RB 51 may cause an occasional titer on the Complement Fixation (CF) or Fluorescence Polarization Assay (FPA) tests. There is some empirical information that apparently some cattle in the Greater Yellowstone Area that were vaccinated with RB 51 as adults may have subsequently had some titers. However, those animals were not tested prior to vaccination so the baseline titers on those animals is unknown. Generally, animals vaccinated with RB 51 do not have titers on the CF or FPA as a result of vaccination. However, there are a few reports of some animals that have become card positive after adult vaccination with RB51. There is speculation that there may be enough O-side chain to cause a titer in a very few animals, perhaps 0.5% to 1% of the animals vaccinated, however data is lacking. There are currently studies ongoing on vaccinated cattle in the Greater Yellowstone Area. It was decided that the data generated by the study should be evaluated and the topic discussed next year.

e. Approval of the FPA and the BAPA as Official Tests in Cervids

A number of brucellosis serological tests have been approved as official tests in cervids. However, the FPA and BAPA have not officially been approved for use in cervids. The subcommittee evaluated data presented as part of an FPA/BAPA validation project for cervid serology samples tested in Idaho, Wyoming and Montana laboratories.

Based on results of this data, the subcommittee recommends that the BAPA be approved as a screening test for brucellosis in cervids, and that the FPA be approved as a confirmatory test for brucellosis cervids.

The brucellosis scientific subcommittee meeting was adjourned at 2:15 p.m.
The Feral Swine Subcommittee met with the Subcommittee on the Greater Yellowstone Area (GYA) and the Scientific Advisory Subcommittee on Sunday, October 2, 2011. Reports were provided on a number of feral swine issues of interest to USAHA and its members. A summary of the reports is included below.

Strategic Baiting for Emergency Containment of Feral Swine
Kurt C. VerCauteren, USDA-APHIS-WS
Co-Authors: Tyler A. Campbell, David B. Long, Michael J. Lavelle, Kurt C. VerCauteren, Bruce R. Leland, Terry Blankenship

Invasive feral swine (Sus scrofa) occur throughout much of the United States where they cause damage to agriculture, property, and natural resources, and threaten human health and safety. Additionally, they are susceptible to >30 viral and bacterial diseases and are therefore a major threat to livestock production. Information is lacking on the exposure and infection rates for these diseases in feral swine populations occurring in the Texas border region. This information is needed to understand risks for transmission and to devise and evaluate control strategies such as containing feral swine following an outbreak of such diseases. We evaluated effects of baiting on feral swine movements and corresponding likelihood of disease spread in the presence of real and simulated culling activities. Our objectives were to determine if baiting of feral swine altered areas of utilization, distances from location centroids to treatment location (control or bait station), and movement rates by survivors during culling activities. Our experiment occurred in spring 2011 during which we collared feral swine with GPS collars on the Rob and Bessie Welder Wildlife Foundation (WWF) in San Patricio County, Texas. We established and maintained a bait station on one side of the WWF and conducted population-wide culling activities, including trapping, controlled shooting, drive shooting, and aerial ginning. We determined and evaluated areas of utilization and movement rates using GPS locations to compare home ranges and movements between animals provided with the bait station and those without under various levels of motivation provided by culling activities. We found that not all feral swine in proximity to the bait station used it. Movements of those that did use the bait station appear to have been impacted by the presence of the bait. Based on our results, we cannot recommend baiting as an alternative to fences for containing animals during culling activities. However, bait stations may be valuable for patterning feral swine movements and conducting observations and removals.
Identifying and Optimizing Prevention and Control Strategies Against the Spread of Viral Pathogens within U.S. Feral Swine Populations

Lindsey Holmstrom, graduate student, University of California, Davis

Summary: Feral swine populations are dramatically increasing in the U.S. and their distributions are becoming more widespread. Estimates of their numbers are more than 4 million, with the majority of feral swine located in Florida, Texas and California. Exotic trans-boundary diseases, such as foot and mouth disease and classical swine fever, could be intentionally or unintentionally introduced into this population and go undetected for prolonged periods of time, self-limit, or become endemic. Our current lack of understanding of those factors that directly influence the local, regional, and national spread and persistence (or disappearance) of high-consequence viral pathogens within feral swine populations limits our ability to optimize disease prevention and control strategies. The goal of our project is to better understand the role that feral swine might play in propagating or extending an outbreak in the U.S. and the options for control. Since the U.S. feral swine population is largely an unknown ecologic system with respect to disease spread, we will collect data on those factors identified as being crucial toward understanding the spread of viral pathogens in feral swine populations. Our end result will be a high-quality dataset that is extensively analyzed and available to the modeling community to strengthen wildlife modeling efforts for informing policy. Understanding movements and interactions of feral swine over various landscapes and ecoregions and identifying the epidemiologic and ecologic factors associated with disease spread will directly enhance the ability of the DHS, USDA and individual state agencies to prepare for, respond to, and recover from introduction of exotic trans-boundary diseases in the future.

Dr. Joseph L. Corn, Southeastern Cooperative Wildlife Disease Study (SCWDS), University of Georgia, provided an update on the National Feral Swine Mapping System (NFSMS). SCWDS produced nationwide feral swine distribution maps in 1982, 1988 and 2004 by working directly with state and territorial natural resources agency personnel. In 1982, 17 states reported feral swine in a total of 475 counties. In 2004, 28 states reported feral swine in 1,014 counties. With support from USDA-APHIS-Veterinary Services (VS) the SCWDS developed and implemented the National Feral Swine Mapping System (NFSMS) in 2008. The NFSMS is an interactive data collection system used to collect and display real time data on the distribution of feral swine in the United States. The real time feral swine distribution maps are produced using data collected from state and territorial natural resources agency personnel and other state/federal wildlife and agriculture agencies. The real time map is available to be viewed by the public on the NFSMS home page. Distribution data submitted by agency personnel are evaluated by SCWDS on a continual basis, and the real time distribution map updated with verified additions on a monthly basis. Feral swine populations and/or
sightings are designated either as established and breeding populations, or as sightings, but only established breeding populations are included on the map and in the total of the number of states with feral swine. Currently 37 states are reporting established feral swine populations. Over 450 additions have been made to the feral swine distribution map through the NFSMS since January 2008. The NFSMS is accessed via the internet at http://www.feralswinemap.org/. Additional data are provided to state/federal agencies and universities on request.

With no other discussion, the Committee adjourned at 4:30 p.m.
The Subcommittee met on October 2, 2011, with Subcommittee chair, Marty Zaluski, calling the meeting to order at 12:30 p.m. The Subcommittee meeting was held in conjunction with the Scientific Advisory Subcommittee and the Brucellosis in Swine Subcommittees.


The subcommittee received a presentation by Neil Anderson on a live capture elk study assessing the exposure rates of elk outside of Montana’s Designated Surveillance Area. The study conducted in January of 2010 found 12 elk out of 100 sampled. Tracking collars and vaginal implant transmitters (VITs) were applied to numerous sampled elk and pregnant, seropositive elk respectively. This is the first year of a multi-year study assessing brucellosis in Montana elk.

The subcommittee discussed and approved two resolutions. These included resolutions: 1.) requesting the inclusion of a description of unsuccessful traces in quarterly brucellosis epidemiological reports, and 2.) requesting technical assistance from the Center of Epidemiology and Animal Health with a decision matrix on management of brucellosis affected herds.
Moving Forward with the Brucellosis Eradication Program
Dr. Michael Carter
USDA-APHIS-VS

Since the publication of the Brucellosis interim rule in December 2010, USDA – Animal Plant Health Inspection Service (APHIS) – Veterinary Services (VS) has been working to transition to the new national bovine brucellosis slaughter surveillance plan. When fully implemented, this change will ultimately reflect a decrease in total slaughter surveillance sample numbers to approximately 3 million slaughter surveillance samples nationwide. Surveillance activities in fiscal year (FY) 2011 reflect this transition.

In FY 2011, approximately 5.3 million head of cattle under the Market Cattle Identification (MCI) surveillance program, reflecting approximately 4.1 million head of cattle tested at slaughter and approximately 1.2 million head of cattle tested at market. This testing disclosed approximately 260 MCI reactors. The resulting epidemiologic investigations identified three of the six brucellosis-affected cattle herds in FY 2011, two in the GYA and one in Texas. All other MCI reactor epidemiologic investigations conducted confirmed negative herds.

Approximately 506,000 additional head of cattle and domestic bison were tested as a result of other surveillance activities. Three of the six brucellosis-affected herds disclosed in FY 2011 were domestic bison herds in the GYA disclosed during testing conducted as part of the State’s increased surveillance activities. The primary reasons for testing on-farm or ranch includes testing for movement and sale (~38%), testing associated with MCI reactor investigations and affected herd epidemiologic investigations (~31%), herd certification testing (~22%), and testing for show or exhibition (~8%).

There were approximately 3.9 million calves and approximately 6,500 adult cattle vaccinated for brucellosis, and there were approximately 2,180 brucellosis certified-free cattle herds. Traditionally, Brucellosis milk surveillance tests (BMST) surveillance has been conducted in all commercial dairies a minimum of two times per year in Class Free States. This surveillance activity has been discontinued at a national level for States that have been Class Free for five years or more and do not have brucellosis in wildlife. The limited amount of BMST that did occur in FY 2011 did not disclose any brucellosis-affected herds.

Since July 10, 2009, all 50 States, Puerto Rico, and the U.S. Virgin Islands classified as Class Free for bovine brucellosis. During the fiscal year 2011, national and state surveillance has identified six bovine brucellosis-affected herds: two located in Montana, one in Texas and three in Wyoming. However, as a result of the interim rule, there was no loss of Class Free State status due to new provisions.

The interim rule removed the automatic loss of Class Free status in any Class Free State if a brucellosis-affected herd is not depopulated within 60 days or if two or more herds are found to have brucellosis within 24 months.
The State can retain its Class Free status if: 1) affected herds are maintained under quarantine; 2) an individual herd plan, including a test-and-remove schedule, is developed and implemented for each affected herd to prevent the spread of brucellosis; and 3) appropriate surveillance is conducted to detect brucellosis in other herds or species.

The interim rule also removes certain surveillance requirements for states or areas that have been Class Free for 5 or more years and do not have *Brucella abortus* in wildlife. The changes include eliminating the twice-yearly ring testing of dairy cattle herds and the elimination for each state to collect blood samples from 95% of all cows and bulls 2 years of age or older. Instead, all recognized slaughtering establishments in such states or areas must agree to participate in slaughter surveillance testing as part of a new national bovine brucellosis surveillance plan. These changes will eliminate redundancies in current slaughter surveillance testing with the goal of shifting resources that have been freed up to the Greater Yellowstone Area.

In order to mitigate the potential risk of transmission of brucellosis from brucellosis affected herds in Class Free States, the interim rule also required any Class Free State with *B. abortus* in wildlife or continued detections of brucellosis-affected herds to develop and implement a brucellosis management plan (BMP) approved by the Administrator. The BMP will: 1) define and explain the basis for the geographic area identified in the BMP; 2) describe mitigation activities for both domestic cattle and bison and wildlife within or from the BMP; and 3) describe epidemiologic assessment and surveillance activities to determine if wildlife populations are affected. BMPs that do not address wildlife must describe epidemiologic activities that demonstrate wildlife populations are not a source of the disease.

VS has begun implementing the National Brucellosis Slaughter Surveillance Plan. The goal of the plan is to conduct slaughter surveillance that represents the national cattle herd and demonstrates to our trading partners the disease-free status of the U.S. domestic cattle and bison herd. It is not intended to replace surveillance in areas where enhanced surveillance is considered necessary. The sample collection strategy provides a statistical sampling of approximately 2.9 million slaughter surveillance samples and provides a 95% confidence that brucellosis would be detected in as few as one infected animal per one million animals. A more descriptive report titled *National Brucellosis Slaughter Surveillance Plan — June 30, 2011* is available on the APHIS web site at http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis.

Under the new plan, blood samples will be collected from 15 selected slaughter establishments in 13 states, representing all regions of the United States. Two establishments are bison-only slaughter plants servicing the GYA. These establishments provide the highest probability of detecting brucellosis where brucellosis in not endemic in the wildlife while maintaining a geographical representation, and minimizing disruption of slaughter establishment operations by sample collection activities. In the VS eastern
region, six slaughter establishments selected are located in six different states. Samples from four of six establishments will go to the Kentucky Regional Laboratory. Samples from the remaining two establishments will go to the Florida Live Oak Laboratory. In the VS western region, the nine establishments selected are located in seven States. Samples will be shipped to one of the following four laboratories: 1) Kansas Regional Laboratory; 2) University of California Tulare Animal Health Laboratory; 3) Texas State-Federal Laboratory Division; or 4) Utah Veterinary Diagnostic Laboratory. This plan will be reviewed annually to determine if changes can be made to improve efficiency.

As USDA-APHIS-VS develops new regulations for the brucellosis program in conjunction with the tuberculosis program, we will continue to engage a wide range of stakeholders and other interested parties for input on the proposed strategies, program standards, surveillance plans, and other policy concepts. USDA-APHIS-VS hosted four public meetings this past spring to discuss the proposed framework and receive comments. Currently USDA-APHIS-VS is drafting the regulatory text and the program standards that will accompany the regulations. Both documents will be published together for comments in 2012.
REPORT OF THE COMMITTEE ON CAPTIVE WILDLIFE AND ALTERNATIVE LIVESTOCK

Chair: Michele Miller, FL
Vice-Chair: Robert Hilsenroth, FL
Acting Chair: John Fischer, GA

Wilbur Amand, PA; Paul Anderson, MN; Scott Bender, AZ; Warren Bluntzer, TX; Deborah Brennan, GA; Justin Brown, GA; Kristina Brunjes, KY; Beth Carlson, ND; Donald Davis, TX; Mark Drew, ID; Nancy Frank, MI; Richard French, NH; Tam Garland, TX; Robert Gerlach, AK; Paul Gibbs, FL; Colin Gillin, OR; Michael Gilsdorf, MD; Chester Gipson, MD; Dean Goeldner, MD; Greg Hawkins, TX; Terry Hensley, TX; Robert Hilsenroth, FL; Sam Holland, SD; David Hunter, MT; John Huntley, WA; Sherman Jack, MS; Shylo Johnson, CO; Kevin Keel, GA; Karl Kinsel, TX; Patrice Klein, MD; Terry Kreeger, WY; Steve Laughlin, OH; Carolyn Laughlin, OH; Francine Lord, CAN; Konstantin Lyashchenko, NY; John MacMillian, AR; David Marshall, NC; Chuck Massengill, MO; Leslie McFarlane, UT; Robert Meyer, WY; Michele Miller, FL; L Devon Miller, IN; Julie Napier, NE; Jeffrey Nelson, IA; Mitchell Palmer, IA; Janet Payeur, IA; William Pittenger, MO; Jewell Plumley, WV; Justin Roach, OK; Keith Roehr, CO; Mark Ruder, GA; Emi Saito, CO; Shawn Schafer, ND; David Schmitt, IA; Stephen Schmitt, MI; Dennis Schmitt, MO; Roy Schultz, IA; Andy Schwartz, TX; Charly Seale, TX; Laurie Seale, WI; Daryl Simon, MN; Jonathan Sleeman, WI; Cleve Tedford, TN; Robert M. Temple, OH; Charles Thoen, IA; Brad Thurston, IN; Kurt VerCauteren, CO; Kimberly Wagner, WI; Rick Wahlert, CO; Ray Waters, IA; Ellen Wiedner, GA; Kyle Wilson, TN; Nora Wineland, MO; Richard Winters, Jr., TX; Peregrine Wolff, NV; Jill Bryar Wood, TX; Taylor Woods, MO; Scott Wright, WI; Glen Zebarth, MN.

The Committee met on October 2, 2011, at the Adam’s Mark Hotel in Buffalo, New York from 12:30-5:30 p.m. There were 25 members and 31 guests present. Dr. John Fischer presided as Acting Chair for the Committee due to unavoidable conflicts of Drs. Miller and Hilsenroth.

Bovine TB in a Farmed Herd of Elk and Fallow Deer

Suelee Robee-Austerman of the USDA-APHIS-NVSL reported on bovine tuberculosis in a farmed cervid herd. In 2009, Mycobacterium bovis infection was detected in a herd of 60 elk (Cervus elaphus) and 50 fallow deer (Dama dama) in Nebraska, USA. Upon depopulation of the herd, the prevalence of bovine tuberculosis (TB) was estimated at ~71–75%, based upon histopathology and culture results. Particularly with elk, gross lesions were often severe and extensive. One year earlier, the majority of the elk had been tested for TB by single cervical test (SCT), and all were negative. After initial detection of a tuberculous elk in this herd, 42 of the 59 elk were tested by
SCT. Of the 42 SCT-tested elk, 28 were TB-infected with only 3/28 reacting upon SCT. After SCT, serum samples were collected from the infected elk and fallow deer from this herd at necropsy and tested by three antibody detection methods including multiantigen print immunoassay, cervidTB STAT-PAK, and dual path platform VetTB (DPP). Serologic test sensitivity ranged from 79 to 97% depending on the test format and host species. Together, these findings demonstrate the opportunities for use of serodiagnosis in the rapid detection of TB in elk and fallow deer.

**Best Practice Working Group on Zoological Contingency Planning**

Kevin M. Dennison of USDA APHIS Animal Care updated the Committee on the Zoological Best Practice Working Group (ZBPWG) activities. The ZBPWG is a USDA APHIS cooperatively funded project managed by the Lincoln Park Zoo in Chicago, Illinois. Additional partners include the Association of Zoos and Aquariums, American Association of Zoo Veterinarians, the Global Federation of Animal Sanctuaries, State representatives, and many additional stakeholders. The project goal has been to develop a set of best practice guides on the various elements of emergency planning for a wide variety of zoological facilities including zoos, aquaria, sanctuaries, wildlife rehabilitation, exotic wildlife ranching, animal entertainment exhibitors, and more. Dr. Yvonne Nadler, a veterinary epidemiologist at the Lincoln Park Zoo, led the project. The work of the ZBPWG has been completed and the work products are available at www.zooanimalhealthnetwork.org.

The work products include the following:

- Risk Assessment Annex
- Administration Annex
- Animal Incident Annex
- Business Recovery Annex
- MOU and MAA Annex
- Criminal Incident Annex
- Training/Exercise Annex
- Lessons Learned
- Data Annex
- Emergency Animal Care Annex
- Facilities Annex
- Emergency transportation Annex
- Planning Roadmap

Zoological facilities offer unique challenges in the face of disasters. 2011 became an extraordinarily active year for the management of emergencies impacting zoological facilities.

Complete evacuation:

- Dakota Zoo, Bismarck, ND (temporary)
- Roosevelt Park Zoo, Minot, ND (long-term with major damage)
Partial evacuation:
- Riverside Zoo, North Platte, NE
- Zoo America, Hershey, PA

Key issues:
- Planning is the key to successful evacuation secondary to forecast flooding.
- Working with local emergency management and mutual aid from peer organizations regionally and nationally is critical.
- Many zoological facilities are eligible for Federal response and recovery cost-share grants (FEMA Public Assistance Grant program), but appropriate documentation of actions and expenses are critical.
- Stakeholder organizations can be extremely valuable partners for both mutual aid and sharing of experiences from previous disasters.

Regulatory emergencies:
- USDA presented with fiscal collapse of a major wildlife sanctuary in Texas with over 330 captive wild animals including chimpanzees, baboons, macaque and other monkeys, lemurs, lions, tigers, bears, leopards, cougars, wolves, and more.
- USDA partnered with the Texas Attorney General, International Fund for Animal Welfare, Global Federation of Animal Sanctuaries, and many individual organizations to help provide resources and assistance until the animals could be voluntarily relocated. Current status is all animals except macaques are out, and the macaques will be leaving soon for a new facility. No unnecessary euthanasia of animals was performed (one geriatric tiger was euthanized for medical reasons during this period.)
- Many of the partnerships and principles of emergency management were applied to the situation to achieve a positive outcome for all concerned.

Update on proposed regulation under the Animal Welfare Act on contingency planning for regulated facilities:
- A proposed rule has passed through a period of public comment and is in final review in the Federal system.
- The rule would require all facilities regulated under the Animal Welfare Act to develop contingency plans (emergency plans) that would:
  - Identify likely risks
  - Identify chain of command and key actions
  - Identify resources needed
  - Train staff in the plan
- Timeline for final approval or disapproval is uncertain
Serodiagnosis of Tuberculosis in Camellid Species

Konstantin Lyashchenko of Chembio Diagnostic Systems, Inc. provided a presentation on serodiagnosis of tuberculosis. Tuberculosis (TB) in South American camellids (SAC) is caused by *Mycobacterium bovis* or *Mycobacterium microti*. Three serological methods – Rapid Test (RT), Dual Path Platform (DPP), and Multiantigen Print Immunoassay (MAPIA) – were evaluated on naturally infected SAC. The study population included 156 alpacas and 175 llamas from Great Britain, Switzerland, and the United States. TB due to *M. bovis* (n=44) or *M. microti* (n=8) was diagnosed by gross pathology examination and culture in 35 alpacas and 17 llamas.

Control animals were from herds with no TB history. In alpacas, RT and DPP showed sensitivity of 71% and 74%, respectively, while in llamas it was 77% for both assays. Diagnostic specificity was higher for DPP (98%) if compared to RT (94%) in llamas and similar for the two assays in alpacas (98%). When the two antibody tests were combined, the parallel testing interpretation (either assay is reactive for a positive result) enhanced the sensitivity of antibody detection to 89% in alpacas and 88% in llamas, but at the expense of lower specificity (97% and 93%, respectively), whereas the serial testing interpretation (both assays must be reactive for a positive result) maximized the specificity to 100% in both SAC species, although the sensitivity was 57% for alpacas and 65% for llamas. Most of the animals with evidence of TB failed to produce skin test reactions, thus confirming concerns about the validity of this method in SAC. The findings suggest that serological assays may offer a more accurate and practical alternative for ante-mortem detection of camellid TB.

Activities of USDA-APHIS Animal Care

Nora Wineland of the USDA-APHIS Animal Care’s Center for Animal Welfare provided an update on proposed and planned rules of interest to the Committee. The contingency plan final rule is expected out soon, as is a final rule regarding itineraries. The proposed rule for rats, mice, and birds remains under development. Recent Office of Inspector General (OIG) audits have resulted in some changes that were discussed. Specifically, safety concerns have resulted in efforts to review and adjust as needed how barriers and enclosures for dangerous animals are viewed by the agency. These reviews are still under way. The problematic dog dealer audit has resulted in some changes as well especially when it comes to consistency of inspections and approaches to enforcement. The current fiscal situation makes this a continued work in progress. In March of 2011 a publicly available search function for inspection reports was launched in support of the current government wide efforts toward transparency. The emergency management area of APHIS Animal Care has been engaged in a couple of areas of note to the captive wildlife community: work with the Zoo Animal Health Network (ZAHN) and the Zoo Best Practices Working Group (ZBPWG). ZAHN has been active in HPAI surveillance, outbreak management (planning) and development of online training, while the
ZBPWG has created a document library which is available on the ZAHN website (www.zooanimalhealthnetwork.org).

USDA-APHIS-VS Chronic Wasting Disease National Program

Patrice N. Klein of USDA APHIS VS – National Center for Animal Health Programs provided an update on the agency’s CWD–related activities:

CWD Rule Update:  The amended final rule on chronic wasting disease (CWD) is currently in departmental clearance.  The rule will set minimum standards for interstate movement and establish the national voluntary Herd Certification Program (HCP).

Farmed/captive cervid surveillance testing:  Through FY2010, VS conducted surveillance testing on approximately 20,000 farmed/captive cervids by the immunohistochemistry (IHC) standard protocol.  As of Sept. 15, 2011, approximately 19,000 farmed/captive cervids were tested by IHC for CWD with funding to cover lab costs provided through NVSL.

Farmed/captive cervid CWD status:  The CWD positive captive white-tailed deer (WTD) herd reported in Missouri (February 2010) was indemnified and depopulation activities were completed in June 2011.  All depopulated animals were tested for CWD, and no additional CWD positive animals were found.

In FY 2011, CWD was reported in two captive elk herds in Nebraska (December 2010 and April 2011).  To date, 52 farmed/captive cervid herds have been identified in 11 states: Colorado, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, New York, Oklahoma, South Dakota, and Wisconsin.  Thirty-nine were elk herds and 13 were WTD herds.  At this time, eight CWD positive herds remain: six elk herds in Colorado and the two elk herds in Nebraska.

Wild Cervid surveillance: In FY 2009 funding supported surveillance in approximately 74,330 wild cervids in 47 cooperating States.  Wild cervid CWD surveillance totals are pending for fiscal year 2010 (2010-2011 calendar year) due to seasonal surveillance activities and completion of final cooperative agreement reporting to APHIS.

In fiscal year 2011, there are 15 ‘tier 1’ States, 20 ‘tier 2’ States, and 15 ‘tier 3’ States.  Two new ‘tier 1’ States, Minnesota and Maryland, were added in fiscal year 2011 based on the new CWD detections in a free-ranging white-tailed deer in southeastern Minnesota and in western Maryland.  Consequently, Delaware was upgraded to ‘tier 2’ status as an adjacent State to Maryland.  For FY 2011, 45 States and 32 Tribes will receive cooperative agreement funds to complete wild cervid surveillance and other approved work plan activities.  Based on FY 2012 projected budget reductions, future cooperative agreement funds will be eliminated.

APHIS CWD Funding:  In FY 2011, APHIS received approximately $15.8 million in appropriated funding for the CWD Program.  The President’s FY 2012 budget proposals to reduce program funding for CWD by $13.9 million,
leaving the program with a request of $1.925 million to provide some level of Federal coordination for the national herd certification program (HCP).

Consequently, APHIS is planning to amend its role in the program to one of Federal coordination. Based on the projected FY 2012 budget, funding for CWD cooperative agreements and indemnity funding for States and Tribes will be eliminated. Under this scenario, the States or cervid industry producers will likely be responsible for the costs of surveillance testing and indemnity for appraisal, depopulation, and disposal of CWD-positive animals.

Commodity Health Line Structure: In the FY 2012 budget, livestock commodities regulated by USDA have been organized into “Commodity Health Line” structures or groupings. APHIS’ Equine, Cervid and Small Ruminant (ECSR) Health line supports efforts to protect the health and thereby improve the quality and productivity of the equine, cervid and small ruminant industries. Activities supported by the ECSR Health Line range from monitoring and surveillance to investigation and response actions undertaken when health issues relevant to the industry are identified. APHIS also maintains regulations and program standards which guide ECSR activities at both the Federal and State/Tribal level.

The ECSR Health line funds essential activities necessary to maintain current ECSR surveillance and program operations while providing the flexibility to respond to new and emerging industry-specific health concerns. APHIS’ current activities include Scrapie, Chronic Wasting Disease (CWD), Slaughter Horse Transport, and Brucellosis/Tuberculosis in cervids. Overall, APHIS will use funding from the ECSR Health Line Item to support Agency efforts in the following mission areas: prevention, preparedness and communication; monitoring, surveillance and detection; response and containment; and continuity of business, mitigation and recovery.

Scrapie in Deer: Comparisons and Contrasts to Chronic Wasting Disease (CWD)

Justin J. Greenlee of the Virus and Prion Diseases Research Unit, National Animal Disease Center, ARS, USDA, Ames, Iowa provided a presentation on scrapie and CWD in inoculated deer. Interspecies transmission studies afford the opportunity to better understand the potential host range and origins of prion diseases. We inoculated white-tailed deer intracranially (IC) and by a natural route of exposure (concurrent oral and intranasal inoculation) with a U.S. scrapie isolate. All deer inoculated by the intracranial route had evidence of PrP Sc accumulation and those necropsied after 20 months post-inoculation (PI) (3/5) had clinical signs, spongiform encephalopathy, and widespread distribution of PrP Sc in neural and lymphoid tissues. A single deer that was necropsied at 15.6 months PI did not have clinical signs, but had widespread distribution of PrP Sc. This highlights the facts that 1) prior to the onset of clinical signs PrP Sc is widely distributed in the CNS and lymphoid tissues, and 2) currently used diagnostic methods are sufficient to detect PrP Sc prior to the onset of clinical signs. The results of this study suggest that there are many similarities in the manifestation of CWD.
and scrapie in white-tailed deer after IC inoculation including early and widespread presence of PrP\textsuperscript{Sc} in lymphoid tissues, clinical signs of depression and weight loss progressing to wasting, and an incubation time of 21-23 months. Moreover, western blots (WB) done on brain material from the obex region have a molecular profile consistent with CWD and distinct from tissues of the cerebrum or the scrapie inoculum. However, results of microscopic and IHC examination indicate that there are differences between the lesions expected in CWD and those that occur in deer with scrapie: amyloid plaques were not noted in any sections of brain examined from these deer and the pattern of immunoreactivity by IHC was diffuse rather than plaque-like. After a natural route of exposure, 100% of white-tailed deer were susceptible to scrapie. Deer developed clinical signs of wasting and mental depression and were necropsied from 28 to 33 months PI. Tissues from these deer were positive for scrapie by IHC and WB. Tissues with PrP\textsuperscript{Sc} immunoreactivity included brain, tonsil, retropharyngeal and mesenteric lymph nodes, hemal node, Peyer’s patches, and spleen. While two WB patterns have been detected in brain regions of deer inoculated by the natural route, unlike the IC inoculated deer, the pattern similar to the scrapie inoculum predominates.

**Committee Business:**

The Committee discussed and approved three resolutions regarding CWD. They can be found in the report of the Committee on Nominations and Resolutions. In summary, the resolutions urged USDA-APHIS-VS to:

- Continue to provide funding for CWD testing of captive cervids;
- Finalize and publish the national CWD rule for Herd Certification and Interstate Movement; and
- Evaluate live animal test, including rectal mucosal biopsy, for CWD in cervids.
REPORT OF THE USAHA/AAVLD COMMITTEE ON DIAGNOSTIC LABORATORY AND VETERINARY WORKFORCE DEVELOPMENT

Co-Chairs: Michael Gilsdorf, MD
David Zeman, SD

J Lee Alley, AL; Gary Anderson, KS; Joan Arnoldi, WI; Bonnie Buntain, CAN; Tony Caver, SC; Mike Chaddock, DC; Neville Clarke, TX; John Clifford, DC; Karen Conyngham, TX; Ron DeHaven, IL; James England, ID; Brian Evans, ON; J. Pat Fitch, MD; Richard French, NH; Francis Galey, WY; Tam Garland, TX; William Hartmann, MN; Floyd Horn, MD; Pamela Hullinger, CA; Paul Kitching, CAN; Don Knowles, WA; Elizabeth Lautner, IA; Randall Levings, IA; Bret Marsh, IN; Barbara Martin, IA; Grant Maxie, CAN; Richard McCapes, CA; Terry McElwain, WA; Thomas McGinn, III, DC; Doris Miller, GA; Bennie Osburn, CA; Eileen Ostlund, IA; Gary Osweiler, IA; Donal O'Toole, WY; Kristy Pabilonia, CO; Lanny Pace, MS; Elizabeth Parker, DC; Barbara Powers, CO; Dale Preston, TX; Willie Reed, IN; Mo Saif, OH; Emi Saito, CO; John Scamahorn, IN; A. David Scarfe, IL; Brian Smith, DC; David Steffen, NE; Alfonso Torres, NY; Richard Willer, HI; William Wilson, KS; Dennis Wilson, CA.

The Committee met on Oct. 1, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 1:00–5:00 p.m. There were 11 members and 16 guests present. The meeting began with several presentations pertinent to the Committee’s purpose and in attendance were special guests and dignitaries including Dr. Rene Carlson, President of the AVMA; Dr. Ron DeHaven, Executive Director of the AVMA; and Dr. John Clifford, USDA APHIS Administrator.

Update on the Committee to Assess the Current and Future Workforce Needs in Veterinary Medicine

National Research Council, Division on Earth and Life Sciences, Policy and Global Affairs Division
National Academy of Sciences
Dr. Bonnie Buntain, University of Calgary College of Veterinary Medicine
2007 Abbreviated Statement of Task

The National Research Council convened an expert committee to study the broad scope of issues related to the veterinary workforce in the United States. The study explores historical changes in the size and characteristics of the veterinary workforce and adequacy of the current supply of veterinarians in different occupational categories and employment sectors and the factors that are likely to affect the numbers of veterinarians seeking jobs in different sectors in the future. The study examined the current and future capacity of universities and colleges to provide sufficient numbers of adequately trained veterinarians and identify training needs relative to the demand for specific expertise. A report will present the findings of the study, and identify options for meeting requirements for a veterinary workforce.
Actions of the Committee

The Committee divided into study groups: Public Practice, Industry, Academic Veterinary Medicine, Wildlife and Ecosystem Health, Food Animal Practice, and Companion Animal Private Practice. Some of the obstacles delaying the completion of the Committee's report included the economic crisis beginning in 2009 that impacted workforce forecasting and the lack of reliable data resulting in the need to conduct surveys and utilize newly published veterinary workforce reports.

In the area of public practice, we focused mostly on the federal sector that had the most data with the GAO reports in 2008 and 2009, and complemented by the OPM's Talent Management Task Force's August 2010 VMO Report. Therefore, more and more relevant current data was being used, furthering the delay.

It is critical that government improve veterinary workforce planning to achieve full veterinary staffing levels, offer competitive salaries, provide various incentives, and effectively work across government agencies. This is especially important in addressing prevention, response and recovery from catastrophic events as well as carrying-out routine mission critical duties. Additionally, academia needs to work closely with government strategic workforce planning in order to produce the competencies valued by government and also explore potential partnerships in veterinary and continuing education.

Survey Results of the State-Employed Veterinary Workforce
Dr. Michael Gilsdorf, National Association of Federal Veterinarians.

The USAHA and AAVLD Co-Chairs of the Diagnostic Laboratory and Veterinary Workforce Committee conducted a survey of all State employed veterinarians during 2011. Out of the 50 States and Washington DC, we received responses from:

- Regulatory: 25 States
- Diagnostic and Public Health: 23 States each

A summary of the data collected is as follows:
STATE EMPLOYED FTE
REGULATORY VETERINARIANS

Total number of Regulatory Veterinarians employed in 26 States = 159 (312/50)
Average number of State Regulatory Veterinarians per State = 5.1/26 States

STATE EMPLOYED FTE
DIAGNOSTIC VETERINARIANS

Total number of Diagnostic Veterinarians employed in 23 States = 94 (204/50)
Average number of State Diagnostic Veterinarians per State = 4/23 States
Total number of Public Health Veterinarians employed in 50 States = 90
Average number of State Public Health Veterinarians per State = 1.4/50 States

AVERAGE STATE REGULATORY VETERINARIAN SALARY

Entry Level Average- $72,034: Range - $50,000 to $90,000
Mid Level Average- $77,754: Range - $50,000 to $100,000
Senior Level Average- $84,662: Range - $69,000 to $110,000

Overall Average Salary- $78,137

N = 25
REPORT OF THE COMMITTEE

AVERAGE STATE DIAGNOSTIC LABORATORY VETERINARIAN SALARY

Entry Level Average - $66,400; Range - $30,000 to $110,000
Mid Level Average - $76,333; Range - $60,000 to $120,000
Senior Level Average - $106,447; Range - $60,000 to $130,000

Overall Average Salary - $83,060

N=23

AVERAGE STATE PUBLIC HEALTH VETERINARIAN SALARY

Entry Level Average - $59,000; Range - $40,000 to $70,000
Mid Level Average - $73,571; Range - $50,000 to $90,000
Senior Level Average - $91,667; Range - $60,000 to $120,000

Overall Average Salary - $77,641

N= 23
Bovine Practitioners Workforce Situation Overview*
Dr. Gatz Riddell, American Association of Bovine Practitioners.

In the late 1990’s rural veterinary practitioners from across the United States began to speak out about difficulties hiring associates in rural mixed animal veterinary practices. Many of these practices served the food animal industries. There were also increasing reports of USDA-FSIS having difficulty hiring veterinarians for food safety positions. In response to these complaints, the Food Supply Veterinary Medicine Coalition (FSVMC) was formed in May 2004 to fund a marketing study to better quantify the demand for, and the availability of, food supply veterinarians.

As a result of the FSVMC study, the Association of Animal Behavior Professionals (AABP) operated for several years under the premise that a shortage of food supply veterinarians existed. Numerous food animal programs at colleges and schools of veterinary medicine strengthened their student recruitment and training efforts. Based upon its mission statement, the AABP significantly increased funding, scholarship and externship opportunities for those interested in bovine medicine. During the past few years, however, AABP student members started to indicate that they could not obtain jobs in food supply veterinary medicine. The pool of interested students with skill sets suited ideally to food animal, specifically bovine practice, had been and continues to be significantly increased by the academic and organizational recruiting programs.

This trend concerned the leadership of AABP and lead to the formation of the AABP Ad Hoc Committee on Rural Veterinary Practice (RVP) in the fall of 2010. The members were mostly from private practice from different regions of the United States. The purpose of this committee was to re-evaluate the perceived food supply veterinarian shortage so that AABP could educate and prepare its members, including student members, to respond to changes in job markets while continuing to serve the veterinary needs of the beef and dairy industries. The focus was on rural mixed practice with a component of food animal service, although food animal exclusive practice was also to be considered.

It was the opinion of the RVP that there is not currently a shortage of veterinarians for rural food supply veterinary private practice. Efforts to increase interest in rural practice among graduating veterinary students have been successful, so lack of available veterinarians is no longer an issue for the U.S. as a whole. However, there remain underserved rural areas across the country that may not be able to sustain a veterinary practice and absorb these new veterinarians entering the job market. In instances where rural jobs are still available, these jobs remain unfilled because the economics may be undesirable for an experienced practitioner and, in small clinics, there may be a lack of mentorship and support for graduating veterinary students.

Delivering veterinary services to underserved areas is a complex problem for which there will be no simple answer. Current programs such as
the VMLRP and VSIA are well-directed and will prove beneficial, but the
development of a business model that can prove sustainable in the face of
current economic, generational and gender issues may be the long term
answer.

Elephants in the Waiting Room
Dr. Rene’ Carlson, President of the American Veterinary Medical Association
(AVMA)

Dr. Carlson provided an overview of the AVMA outlook for economic and
employment factors affecting the future of veterinary medicine. Specifically,
she outlined the economic vision and strategy for addressing veterinary
professional viability, such as:

1. Strengthen the economics of the veterinary medical profession
   A. Strengthen Veterinary Practice Profitability and Financial Wellbeing
   B. Enhance Veterinary Medical Workforce
      – Goal: Veterinary employment opportunities are identified and
        solutions developed to effectively balance the needs of society
        with the supply of veterinarians.

2. Catalyze a transformation of veterinary medical education.

Update on Workforce Issues in Veterinary Diagnostic Laboratories
Dr. David Zeman, South Dakota State University – Animal Disease Research
and Diagnostic Laboratory

Who will train the next generation of diagnostic specialists that will work
in our labs?

- Pathologist
- Bacteriologist
- Virologist
- Chemist / Toxicologist
- Parasitologist
- Immunologist
- Molecular Biologist
- Epidemiologist

A sobering statistic regarding Vet Med education: “…40% of aging
faculty eligible for retirement over the next 10 years and an absence of
identifiable replacements…”

Roadmap for Veterinary Medical Education in the 21st Century. North
American Veterinary Medical Education Consortium (NAVMEC) 2011.
Growing areas of Specialization that may compete with basic scientist
training at College of Veterinary Medicine (CVMs). New areas of
specialization needed…

- Small Animal Medicine
- Dermatology
- Oncology
- Emergency Room Care
Epidemiology
Public Health Vet Med
Surgery
Molecular Biologist

Downsizing of Government sponsored animal health research...
Most basic scientists currently working in animal health diagnostic and research laboratories were trained on grants sponsored by federal or state research programs such as USDA or National Institute of Health (NIH). That is now dwindling. The USDA research budget has continued to shrink, creating the need for researchers in animal health organizations to focus more on zoonotic and crossover diseases that may be of interest to NIH as well as USDA.

Veterinary Pathologist Training Program Demographic Survey: Final Report
Prepared by Linda Owens, Kelly Marzano, and Evelyn Yang for the American College of Veterinary Pathologists, the Society of Toxicologic Pathology, and the American Society for Veterinary Clinical Pathology. This detailed report offers insight into specialization training that likely applies to several other basic science disciplines.

I will highlight a few areas from this report to exemplify the training issues that many disciplines face.

- Factors limiting the number of positions
- Almost all (88.2%) anatomic pathology program respondents indicated that funding for residency limits the number of anatomic pathology trainee positions, while 35.3% named funding for Ph.D. training as a factor. Nearly two thirds (61.8%) cited number of available faculty as a limitation, and 14.7% suggested that the number of applicants is an issue. Finally, 29.4% of anatomic pathology respondents wrote in “other” limitations, which included limited case loads, space constraints, and funding limits.

Pathologists
Anatomic Pathology
- Approximately 40% of anatomic pathologists took jobs in academia after graduating.
- Pharmaceutical companies hired about 20%.
- Private labs, government labs, and contract labs each hired about 10%.
- Just over 8% fell into one of the other response categories.

Pathologist Data
Known, estimated, and average deficit of veterinary pathologists was explored. Survey results and results from the calculations described above allow us to ascertain, by comparing supply and demand figures, if there is or will be a deficit of veterinary pathologists and, if so, the potential size of that
deficit. It appears that the number of new veterinary pathologists being produced will be insufficient to fill the number of expected open positions. For anatomic pathology:

- The known deficit (Column C) ranges from -10 (a surplus of 10) to 18 (10 in 2010, 18 in 2013).
- The estimated total deficit (Column F) ranges from 10 in 2010 to 52 in 2009.
- The estimated average deficit (Column H) ranges from 0 (2010) to 32.5 (2009) anatomic pathologists.

What does this mean for staffing our AALVD and NAHLN lab? There may be rocky times ahead for staffing our labs due to public funding cuts relative to basic science training programs. In addition, 40% of academicians are retiring within the next decade… a major drain on experience and the passing of the education and specialty training baton.

**Committee Business**

The Committee then reviewed their resolutions.

The following resolutions were **modified**:

- #14 Support for section 1433 formula funds for animal health and research
- #18 Support for food animal residue avoidance databank
- #15 Seterinary public health workforce and education act
- #13 Veterinary services investment act

The following resolutions were **unchanged**, but still pertinent:

- #5 & #20 National animal health laboratory network information technology development support
- #10 Increased funding for research and education on causes of zoonotic diseases
- #11 Preparation of the veterinary workforce to better perform accredited tasks, including detection of and response to animal disease
- #12 & #25 Controlled substance act regulations for ambulatory doctors of veterinary medicine that practice in multiple states
- #16 Veterinary medicine loan repayment program
- #17 Review of compensation for research and diagnostic veterinarians
- #19 Support for regional centers of excellence in food systems veterinary medicine

The Committee approved two new resolutions, which were forwarded to the Committee on Nominations and Resolutions.
• NAHLN Funding (From the Committee on Animal Emergency Management)
• Maintaining a Well-Trained Federal Veterinary Field Workforce and Developing a System for Continually Improving Animal Health Programs at the Field Level.
REPORT OF THE USAHA/AAVLD COMMITTEE ON ENVIRONMENT AND TOXICOLOGY

Co-Chairs: Wilson Rumbeiha, MI
Larry Thompson, MO

David Ailor, DC; A. Catherine Barr, TX; Karyn Bischoff, NY; Tim Evans, MO; Francis Galey, WY; Tam Garland, TX; L. Wayne Godwin, FL; Ramesh Gupta, KY; Jeffery Hall, UT; Jeffrey Hamer, PA; William Hare, MD; Brent Hoff, ON; Steve Hooser, IN; Laurent O'Gene Lollis, FL; Randall Lovell, MD; Travis Mays, TX; David Meeker, VA; Gavin Meerdink, IL; Sandra Morgan, OK; Michelle Mostrom, ND; Lee Myers, GA; Eileen Oslund, IA; Elizabeth Parker, DC; Robert Poppenga, CA; John Rathje, IA; John Reagor, TX; Jane Robens, MD; Nick Schrier, ON; Lori Smith, KY; Patricia Talcott, WA; Larry Thompson, MO; Gary Weber, MD.

The Committee met on Oct. 1, 2011, at the Adam’s Mark Hotel in Buffalo, New York from 3:30 - 6:30 p.m. There were 37 attendees present.

Dr. Larry Thompson opened the meeting at 3:40 p.m., welcomed everyone, and handed out the meeting agenda. Larry then handed out attendance sheets.

Dr. Thompson indicated he was asked by Dr. Gary Osweiler, who has a family commitment and could not attend, to serve as the USAHA co-chair for the 2011 meeting and to serve as the USAHA co-chair for the remainder of Gary’s term, with the approval of the USAHA president.

Dr. Thompson indicated that at the end of this meeting there will be elections for a new scribe/secretary to take over for Dr. Randall Lovell immediately after the 2011 meeting and for a new AAVLD co-chair to take over for Dr. Wilson Rumbeiha after the 2012 meeting.

Dr. Rumbeiha then opened the floor for questions to Dr. Renate Reimschuessel, FDA/CVM. Renate had just presented a talk in the same room entitled “Vet-LRN – Center for Veterinary Medicine’s Laboratory Response Network Focusing on Animal Feeds and Drugs” as part of the AAVLD Toxicology Scientific Session. Instead of repeating this talk to the same audience, Renate answered many questions from attendees at the USAHA/AAVLD Committee on Environment and Toxicology as part of her Year 1 update on Vet-LRN. These questions included, but were not limited to: the possible purchase and/or lease of equipment for use by participating laboratories and the development of standardized protocols by the labs. Renate encouraged everyone to contact her at renate.reimschuessel@fda.hhs.gov if anyone had additional comments, concerns or questions or if they wished to submit a proposal.
Dr. Tim Evans, Veterinary Medical Diagnostic Laboratory, University of Missouri, Columbia presented a talk entitled Practical Aspects of Ergot Contaminated Feeds. Tim indicated that ergotism is an ancient disease caused by various alkaloids, especially ergopeptine alkaloids, produced by *Claviceps purpurea*. This fungus produces ergot bodies (sclerotia) that are found on many grasses (including, but not limited to, fescue, brome and timothy) and many cereal grains (especially wheat, rye, barley and oats, but NOT on corn). These ergot bodies vary widely in size and shape with the largest ones being found on barley.

Clinical signs in animal species are due primarily to vasoconstrictive and hypoprolactinemic effects of the alkaloids and often include decreased milk production (even agalactia) and dry gangrene of the extremities (feet, tongue, comb, etc.). The mare is one of the most sensitive animals to the alkaloids, and agalactia (or decreased milk production) is a hallmark clinical sign. Clinical signs in cattle are dependent on environmental temperatures with summer slump (increased body temperature and decreased production parameters) occurring during hot weather and fescue foot (sloughing of hoofs and/or feet) occurring during cold weather.

Dr. Evans indicated there is anecdotal evidence of adverse effects in mares (agalactia or decreased milk production) when the total dietary concentration of ergopeptine alkaloids exceeds 50 ppb. There is anecdotal evidence of adverse effects in other livestock when the total dietary concentration of ergopeptine alkaloids exceeds 100 to 200 ppb. The ergopeptine alkaloid concentration of ergot bodies varies widely from ~0.01% to 1% with the weighted average of ~0.2% to ~0.3%. Thus, if ergot bodies comprise 0.1% of the complete ration, this equates to approximately 0.1 ppm (100 ppb) to 10 ppm (10,000 ppb) in the feed with a likely mean of about 2-3 ppm (2,000 to 3,000 ppb). Ergot alkaloids in animal feeds are measured at the University of Missouri using a High Pressure Liquid Chromatography – Mass Spectrometry (HPLC-MS) method.

Dr. Evans also discussed the life cycle of the fungus (including both the sexual and asexual reproductive stages) and the ways to best prevent/control this disease (deep tilling of the soil, awareness of clinical signs, screen harvested grains and avoid use of these grain screenings in feedstuffs, etc.). Lastly, Tim indicated that ergot alkaloids have not been demonstrated in milk, but do have the potential to bioaccumulate in fat.

Dr. Rumbeiha then opened the floor for the reporting of mycotoxin results from the states. He reminded attendees of the preliminary results provided prior to the meeting from Alabama, California, Colorado, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky (both the Breathitt Veterinary Center in western Kentucky and the University of Kentucky in Lexington, Kentucky), Missouri, Nebraska, New York, North Dakota, Oklahoma, Pennsylvania, Texas, Wisconsin, Wyoming, and Ontario, Canada.
Dr. Michelle Mostrom, North Dakota State University, also reported finding 50 ppm of deoxynivalenol (DON) in wheat straw and up to 20 ppm DON and 1-2 ppm of zearalenone in corn silage this year. Although high levels of aflatoxins (700 – 800 ppb) in southern corn (only the general location of the state where the corn was harvested from was provided on the accession) have been found by her lab, no affected animals have been reported. Much of the corn crop in the upper Midwest has not been harvested so everyone needs to realize that the preliminary results presented at this meeting may change as more data becomes available.

Texas Veterinary Medical Diagnostic Laboratory (VMDL) has reported levels of up to 1,373 ppb of aflatoxins, although only 19 of 80 tests from 56 accessions (mostly in corn) were positive for aflatoxins. The Office of the Texas State Chemist tested 594 samples from a variety of matrices for aflatoxins with the highest level found being 768 ppb.

Missouri has recently found high levels in aflatoxins in the 2011 crop. Illinois recently found 1,300 ppb aflatoxins (B1+B2+G1+G2) in a corn sample and 8 ppb (aflatoxin M1) in a milk sample from a dairy.

Corn gluten meal has been found with 3-7 ppm of zearalenone without any DON. It is unclear if this is due to concentration of this mycotoxin during processing or represents elevated levels of zearalenone in the corn used to produce the corn gluten meal.

DON was recently found in grain at 15-20 ppm from a Midwest state. Finally, the 500 ppm vomitoxin (DON) reported by Kentucky (Western) in six feed samples was incorrect and should have been 5 ppm.

Dr. Rumeiha indicated we were done with all the non-business items and recessed the meeting for a 10 minute break at 4:45 p.m.

Dr. Thompson called the meeting back to order at 4:56 p.m.

Dr. Bob Poppenga, California Animal Health and Food Safety Laboratory, then provided the Report of the Mission Statement Subcommittee. This subcommittee was chaired by Dr. Poppenga and its members included Drs. Dwayne Hamar, John Reagor and Larry Thompson. After discussion at teleconferences prior to this meeting, the subcommittee developed the following proposed mission statement:

The mission of the USAHA/AAVLD Joint Committee on the Environment and Toxicology is to provide the USAHA and AAVLD with guidance, based upon sound scientific principles, on chemical residues that negatively affect or have the potential to negatively affect animal health, food or feed safety, or the environment.
After Dr. Poppenga led discussions on this proposed mission statement for several minutes, a consensus was reached by the 27 members still attending the meeting for the following new mission statement of this joint Committee:

*The mission of the USAHA/AAVLD Joint Committee on the Environment and Toxicology is to provide guidance, based upon sound scientific principles, on chemical residues and toxicants that negatively affect or have the potential to negatively affect animal or public health, food or feed safety, or the environment.*

Dr. Steve Hooser, Animal Disease Diagnostic Laboratory, Purdue University, then provided the Report of the Proficiency Testing Subcommittee. This subcommittee was co-chaired by Dr. Hooser and Dr. Cat Barr and its members included Drs. Jeff Hall, Walt Hyde, Bob Poppenga, and Nick Schrier. This subcommittee had two conference calls prior to the meeting.

Dr. Jeff Hall, Utah State University, has lyophilized and prepared for shipping a bovine liver from a lead poisoning case. This liver will be sent to Dr. Hyde at National Veterinary Service Laboratory (NVSL) who will then ship the samples to the participating labs. The subcommittee asks the participating labs to analyze the liver for as many elements as possible and send their results back to Dr. Hyde at NVSL who will prepare a report of all the findings.

It was reported that NVSL may have up to $30,000 to help fund parts of this proficiency testing (PT) for the next year. The PT Subcommittee will be preparing a report on the costs related to the above proposed proficiency testing (acquiring tissues, preparing tissues for shipping, analyzing samples for homogeneity, shipping to participating labs, correspondence with labs, and/or preparing final report, etc.) and will submit a proposal to NVSL in hopes of securing funds that may be available. The co-chairs of this subcommittee were asked to send a letter of thanks to Dr. Beth Lautner at NVSL for her past support of our PT program.

If funding from the NVSL is not obtained, then participating labs will likely need to pay for this proficiency testing services by subscription and this subcommittee will need to develop plans to collect and utilize these funds. Ideas for inclusion in future proficiency testing included the following:

- Nitrates in forage
- Vitamin E and selenium in liver and serum
- Metals in animal feed
- Insecticides in liver
- Anticoagulants in liver
REPORT OF THE COMMITTEE

- MGA in animal feed
- DON in wheat straw
- Nitrates in ocular fluid
- Alkaloids, especially strychnine and nicotine, in gut contents and/or urine

It was noted that additional testing on the stability of nitrates in ocular fluid will need to be conducted before this fluid could be seriously considered and that AAFCO already has a proficiency testing program for elements in animal feed.

The PT Subcommittee currently has contacts in 33 labs performing toxicology testing in animal tissues/fluids or animal feeds. Putting information about the toxicology PT program on the AAVLD list serve was believed to be a good public relations move.

All aspects of the PT program described above, including ways to obtain long-term funding from NVSL and/or Vet-LRN and ways to rotate who prepares samples for the PT program, will be discussed at the toxicology retreat in Canada.

Dr. Jeff Hall was unable to attend the meeting so Dr. Rumbeiha presented slides and led the discussion on Survey Results of State Reporting Requirements for Toxicology. Dr. Rumbeiha believes there has been a good overall response to the survey that was sent to all 50 states by Dr. Hall on July 28, 2011, but does not know exactly how many states have responded.

Dr. Rumbeiha was copied on the survey responses from 10 states and believes there are no reporting requirements for toxin-induced diseases in many states. There are considerable differences in the reporting requirements for toxin-induced diseases between states with such requirements. Dr. Rumbeiha showed or discussed the language for the reporting requirements for toxin-induced diseases in Michigan, Iowa, Utah, Maine, and North Dakota. Dr. Cynthia Gaskill indicated that Kentucky has recently added toxicants to the list of reportable diseases.

Following discussion, there was a general agreement that this Committee should work on developing model language for the reporting of toxin-induced diseases that provides broad authority, but is not too intrusive. Issues related to confidentiality of client records, enforcement of the laws, and the large number of reportable diseases already on the books will need to be considered when writing this model language. The Committee will also need to be transparent and open and work closely with the AVMA (as this organization is re-writing their Model Practice Act) and with State Veterinary Medical Associations and State Departments of Agriculture (who often coordinate and implement any animal emergency responses).

Committee Business

The action items from this discussion were as follows: Dr. Jeff Hall or a committee designee will tabulate the results from the 50 state survey and
report back to the Committee in 2012. The committee will communicate its concerns about the lack of reporting requirements for toxin-induced diseases in many states to the USAHA and AAVLD. The committee will explore the development of model language for the reporting of toxin-induced diseases.

Dr. Larry Thompson opened the floor to any new business. Nominations were made and seconded for the Scribe/Secretary and incoming AAVLD Co-Chair. By unanimous voice votes Dr. Cynthia Gaskill was elected as the new Scribe/Secretary and Dr. Tim Evans was elected as the new incoming AAVLD Co-Chair and will take office after the 2012 meeting.

A motion to adjourn was made by Dr. Tam Garland and it was seconded and unanimously approved by voice vote.
Alabama: John Roberts
   Last year from October 2010 until present, at the Alabama Diagnostic lab (Thompson Bishop Sparks State Diagnostic lab) we had: Aflatoxin tested in 24 feed samples and there were 6/24 with levels between 4-10 ppb and one sample of pig feed 1/23 with a level of 28 ppb.
   We tested two dog feed samples for DON and it was not detected above 0.5 ppm in any sample.
   We tested 4 samples of feed with corn for fumonisins and 4/4 had detection of low level between 0.76-2.0 ppm.
   Zearalenone was not requested in that time period.
California: Elizabeth Tor
   Some positive feed samples for DON, 1-2ppm. Few cases with stomach contents and urine tested positive for both: Penitren A and Roquefortine C.
Colorado: Dwayne Hamar
   No report of suspected mycotoxins.
Idaho: Patricia Talcott
   Not much from the PNW, to my knowledge. Few perennial ryegrass staggers, fescue and ergot cases.
Indiana: Christina Wilson
   Positive mycotoxins for the past year (number of samples positive at that level):
   DON: 1 ppm (7), 2 ppm (3), 4 ppm (1), 5 ppm (2), 8 ppm (1), 10 ppm (2)
   Zearalenone: 1 ppm (4), 2 ppm (1)
Illinois: Gene Niles
   We're not seeing any so far but I'm expecting plenty of aflatoxin and fumonisin with the dry weather here.
Iowa: Paula Imerman

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Kansas: Deon van der Merwe
   We did not have many mycotoxin cases the past year in Kansas, but we had some interesting ones.
We received several (around 10) calls regarding ergot in wheat during early to middle July. Some of the calls were related to wheat that had been refused by buyers because of the presence of ergot sclerotia. My impression was that most of the problems occurred in Nebraska or close to the Kansas Nebraska border. We recommended that samples be sent to Missouri VMDL for ergot alkaloid testing.

I had a call last week related to aflatoxin in corn in North-Central Kansas that was reported to contain 40 ppb (the test was not performed by us), and refused by a buyer. We have not had positive aflatoxin test results in samples submitted to us thus far this year. Many producers are concerned, however, due to the poor state of the corn crop in many areas.

A corn-based horse feed sample tested positive for Fumonisin (15 ppm) in early June.

There was an interesting case of penitrem A poisoning in two dogs that had consumed garbage in November 2010. The dogs displayed “classic” signs of strychnine poisoning, but no strychnine was identified. 25-100 ppm penitrem A was found in vomitus samples. Both dogs died.

Kentucky (Western): Ramesh Gupta

From Breathitt Veterinary Center in Western Kentucky:
Six feed samples out of 15 samples contained aflatoxin B1 (13-50 ppb) and aflatoxin B2 (2-4 ppb).
In another case, six feed samples contained vomitoxin (500 ppm). [verify]

Kentucky: Cynthia Gaskill

We have not had much in the way of feed mycotoxins this year. We send our feed samples to North Dakota for analysis. I expect we will be getting more samples submitted in the next few months. We had a very late planting season here because of all the heavy rains this spring. We have had a few tremorgenic mycotoxin (penitrem A and Roquefortine) cases in small animals.

Missouri: Tim Evans

Ergots: 149 samples, 74 positives. Many of these were from the Pacific northwest.
Ergot/ergovaline: 36 samples; 1-ergot only, 1 ergot and ergovaline, 6 ergovaline only for a total of 8 positives. (Many of these were out of state).
Ergovaline: 9 samples and 2 positives
Mycotoxin screen: 153 samples; 10 vomitoxin and zearalenone, 43 vomitoxin only, 2 zearalenone only for a total of 55 positives. Many of the positive mycotoxins (vomitoxin and zearalenone) came from Ohio.
Aflatoxin: 41 samples and 6 positives. Most of the positives were from corn grown in texas.
Vomitoxin: 5 samples and 3 positives mainly Missouri
Fumonisin: 16 samples and 12 positives. Currently don’t have feel for distribution.
Aflatoxin M1: 4 samples and no positives
Oosporein: 52 samples and no positives
Ochratoxin: 8 samples and no positives

**Nebraska: Michael P Carlson**

Ergot contamination of the 2011 winter wheat crop was greater than usual. It seems to be more prevalent along the Kansas-Nebraska border. We are in the process of having some specimens analyzed for ergot alkaloid content.

According to the extension plant pathologist here at UNL with whom I have worked on the ergot problem, the incidence of wheat scab and concurrent DON and zearalenone contamination in the 2011 NE wheat crop was not extraordinary, even though the weather conditions during the spring and early summer that favored *Claviceps* infection should also have favored *Fusarium* infection, too. Supporting that notion, I got no calls about Fusarium-related problems, just calls about ergot.

**New York: Karyn Biscoff**

We got definitive diagnoses on at least 2 cases of penitrem toxicosis, affecting about half a dozen dogs total, back in November and December of 2010. We aren't seeing anything right now, though there are rumors of "mycotoxin in barley" but I think that's due to some positive tests for DON coming out of Pennsylvania and the Midwest. We haven't actually seen any DON in barley here.

**North Dakota: Michelle Mostrom**

North Dakota has just started harvesting wheat – low levels of DON in some Red River Valley wheat (< 1 ppm). No corn harvest started.

Low level of DON (<2 ppm) and zearalenone (0.5 to 1.0 ppm) in corn silage from some Midwest states.

We have found high concentrations of aflatoxin in southern corn (up to 700 to 800 ppb aflatoxins). Fumonisins in corn harvest have been low, with 18 ppm the highest that we tested from southern corn. Sorry that I can't be specific on states, but some samples come in from other companies and only know general location.

**Oklahoma: Sandra Morgan**

We lost a lot of our corn crop due to drought, but the corn we are testing has ranged from 0-570ppb aflatoxin with an average of 200ppb. The Fumonisin tests we have run have been low so far. There have been some suspected ergot and tremorgenic mycotoxins cases, but no confirmation.

**Ontario, Canada: Brent Hoff**

In Ontario 79 samples of wheat were tested for DON:

- 3> 6.00 ppm
- 6 4-6 ppm
- 8 2-4 ppm
- 6 1-2 ppm
- rest <1.00 ppm

**Pennsylvania: Lisa Murphy**
We don't really get enough samples to comment on Pennsylvania.

**Texas (College Station): Tam Garland**

Since Jan. 1, 2011, we have done 56 aflatoxin accession but 80 tests, of which 19 were positive for aflatoxin. Most of samples were corn but we had a few dog foods which where thankfully negative. Our samples ranged from 20 ppb to 1,373 ppb. In addition to our samples the Office of the Texas State Chemist (a feed regulatory arm) has tested 594 samples for aflatoxin in a variety of matrixes with numbers ranging from none detected to 768 ppb.

Since Jan. 1, 2011, we have had 18 fumonisin accessions but 27 tests, of which four were positive for fumonisin. Most of our samples were feed, but we did have one case that insisted on testing dog food, which was negative. Our samples ranged from none detected, to 5 ppm and up to 157 ppm.

In addition to our samples, the Office of the Texas State Chemist (a feed regulatory arm) has tested 527 samples for fumonisin with numbers ranging from none detected, and between 1 and 16 ppm.

**Texas (Texas State Chemist FY 2011 and FY 2005-2010): Lynn Post**
Wisconsin: Dave Zoromski
Wisconsin has not seen much in the way of mycotoxins submitted to the laboratory. I believe that most owners and veterinarians are sending samples directly to North Dakota or Iowa to avoid our accession and shipping fees. In the past year, we have only had 6 submissions that we forwarded to North Dakota. Of these, 5 had levels of DON (0.5, 1.4, 1.5, 1.6, 2.2 ppm). The Department of Agriculture, Trade and Consumer Protection may have additional test information. I will contact them to see what they may have done.

Wyoming: Merl Raisbeck
Haven't heard of any in our area.
REPORT OF THE COMMITTEE ON FOOD AND FEED SAFETY

Chair: Bonnie Buntain, CAN
Vice Chair: John Ragan, MD

David Ailor, DC; Deanna Baldwin, MD; Marilyn Balmer, MD; Joseph Blair, VA; Richard Breitmeyer, CA; Deborah Brennan, GA; Tony Caver, SC; Kevin Custer, IA; Glenda Davis, AZ; Ignacio dela Cruz, MNP; Linda Detwiler, NJ; Reta Dyess, TX; Kathy Finnerty, NY; Robert Gerlach, AK; Nancy Halpern, NJ; David Harlan, MN; Larry Hawkins, MO; Jay Hawley, IN; Douglas Hepper, CA; Jan Hershenson, CA; Christine Hoang, IL; Donald Hoenig, ME; Rex Holt, GA; Kristin Holt, GA; Clyde Hoskings, SC; Danny Hughes, AR; John Huntley, WA; Stewart Jacobson, AZ; Susan Keller, ND; Barry Kelly, CA; Daniel Lafontaine, MD; Dale Lauer, MN; Elizabeth Lautner, IA; Tsang Long Lin, IN; Laurent O'Gene Lollis, FL; John MacMillian, AR; Bret Marsh, IN; David Marshall, NC; Kris Mazurczak, IL; James McKean, IA; Katherine McNamara, VT; David Meeker, VA; Nicole Neeser, MN; David Nolan, KS; Carol Olmstead, MT; Kenneth Olson, IL; Gary Osweiler, IA; Bob Pitts, GA; M. Gatz Riddell, Jr., AL; Jane Robens, MD; Nancy Robinson, MO; Mo Saif, OH; John Sanders, WV; Irene Schiller, CHE; Harry Snelson, NC; Bruce Stewart-Brown, MD; Stanley Stromberg, OK; H. Wesley Towers, DE; Bob Tully, KS; Gary Weber, MD; Larry Wilson, NE; Dennis Wilson, CA; Nora Wineland, MO.

The Committee met on Oct. 2, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 1:30-5:00 p.m. During the presentations there were 40-60 attendees coming and going. At the 4:30 p.m. committee meeting there were nine members and no guests present.

Committee Mission Statement:

The purpose of the Committee on Food and Feed Safety is to serve as a focal point for consideration of food safety and feed safety issues within USAHA. The Committee should recommend food/feed safety policies to protect animal and human health and be active in all areas of food/feed safety concerning foods of animal origin. Further, the Committee should provide a national forum for debate on minimizing chemical, microbial and physical contamination in the feed of food producing animals and provide specific recommendations, using the latest available knowledge to enhance the safety of animal feeds.

There were no time specific presentations but all presentations were delivered according to the agenda. Dr. Ragan took lecture notes that are in this report in combination with excerpts from the presenters’ power point slides that were provided to the Chair.
**E. coli Vaccination Outcomes and Risk Analysis**

H. Scott Hurd, DVM, PhD, College of Veterinary Medicine, Department of Production Animal Medicine
Former Deputy Undersecretary of Food Safety, USDA, Director of World Health Organization Collaborating Center for Risk Analysis and Hazard Surveillance and Intervention in Food Animals, Co-Director Collaboration for Comparative Outcomes Research and Evaluation (CCORE), Iowa State University

**Summary:** Packers are implementing numerous antimicrobial interventions. FSIS is considering a more active role in pre-harvest food safety. Pre-harvest interventions work some of the time. Industry is concerned about E. coli and other foodborne agents because they do not wish to make people sick. Also, the economic impact of negative publicity, recalls and potential legal liability are all sources of concern. Pre-harvest interventions are generally less effective than carcass and product treatments. Review of Salmonella infection and reduction programs in Denmark suggests an early limit to human health improvement resulting from pre-harvest intervention. In-plant programs showed more positive change in public health. “Let’s not waste our time on pre-harvest efforts to reduce Salmonella exposure to humans from pork”. Industry may be at the point of diminishing returns in controlling E. coli in beef. We need a special set of circumstances to gain major improvement through pre-harvest intervention; vaccines may offer a breakthrough in this regard. Vaccine research looked at scenarios in which 80, 60, and 40 percent reduction in carcass contamination. Best case scenario could reduce human cases by 60 percent.

More likely scenario of reduced vaccine use could accomplish 36 percent reduction in human cases.

In sum, the use of the vaccine researched could offer a major reduction in carcass contamination and human disease. Research is underway to determine if a vaccine would affect other E. coli strains. Some common genes have been identified. Work on a vaccine will be published in the near future.

Preharvest interventions work best when:

- the pathogen originates solely on the farm;
- a food animal is the primary host;
- the pathogen does not live well outside the host;
- the percentage of positive farms is relatively low;
- post-harvest methods are “maxed-out”; and
- dealing with outlier events.

Dr. Hurd’s research group developed a stochastic simulation model to evaluate the impact of O157:H7 vaccination on key epidemiological outcome measures. The model considered a reduction in the O157:H7 prevalence as well as concentration in cattle feces due to vaccination. The impact of this reduction on various risk outcomes was evaluated by simulating the
relationships between the O157:H7 prevalence and concentration at various points in the ground beef supply chain. The uncertainty and variability associated with the O157:H7 contamination was explicitly modeled on a carcass-by-carcass basis.

The E. coli O157:H7 vaccine mathematical model focused on the goal of reducing “hot lot” losses (hot lot = more than 1,000 E. coli O157:H7 contaminated ground beef servings from a single lot). Some findings:

- The number of events where multiple O157:H7 illnesses (outbreaks) might occur from a single production lot can be reduced by appropriate vaccination use. Industry test and hold may significantly mitigate this risk.
- All levels of efficacy and adoption reduce the risk to packer
- Full adoption of 80% effective vaccine virtually eliminates chance of Hot Lots (96% reduction)
- 40% adoption of an 80% effective vaccine results in 43% reduction in probability of Hot Lots
- 80% adoption of 60% effective vaccine results in 49% reduction in probability of detection by FSIS
- Analysis included impact of biological variation and uncertainty in parameters
- Modeled from “farm to fork” using best available scientific data
- Showed that vaccination reduces
  - Human O157:H7 cases
  - Risk of FSIS regulatory detection
  - Chance of large outbreak from a lot
  - Frequency and magnitude of “event days”

**Antimicrobial Drug Use and AMR in Food Animals**
Bo Norby, CVM, MPVM, PhD, Department of Large Animal Clinical Science, Michigan State University, College of Veterinary Medicine

**Summary:** Spoke about risk of antimicrobial resistance (AMR), the concerns of producers, consumers, veterinarians and regulators. Resistance to antimicrobials began to occur early in the use of antimicrobial products. FDA has proposed guidance or regulatory actions to reduce or control the use of antimicrobials in food animals. Sourcing of samples and methodology of testing for resistance to antimicrobials may result in major differences in findings. There is a need for the adoption of standardized methods for sampling and testing for AMR. Studies were conducted to define variation in AMR findings due to testing procedures. Used ceftiofur and E. coli in studies. Treatment status of animals may affect results of sampling and testing. The effect of using antimicrobial drugs on steers included short-term reduction in E. coli in animals treated with ceftiofur and ceftiofur resistant E. coli went up to 40 percent. Multidrug resistance was observed in the steers treated, increasing with the dose and frequency of ceftiofur used.
Occurrence of AMR E. coli in one study was approximately twice as high in conventional dairy herds compared to organically managed dairies. Withdrawal of antibiotic treatment may be expected to reduce AMR. Treatment of small number of animals instead an entire pen may reduce the development of AMR. Consumer advocacy may result in regulatory actions to reduce or ban antimicrobial use in food animals. Risks of AMR may not be as high they have seemed to be. Communication among producers and consumers is an important need.

Long-term effects of antimicrobials on AMR:
- Exceedingly hard to assess
- Longitudinal very expensive
- Will what we found today be valid tomorrow?
- Which populations to focus on?
- Fitness of resistant bacteria may abate by time
- Which animals, bacteria and drugs to focus on?

Comparing Organic vs. Conventional farms:
- Overall AMR prevalence lower in ORG/ABF versus CONV for some 'bug-drug' combinations
- The magnitude of the 'ORG/ABF effect' varies tremendously.
- Optimist/pessimist
- Single resistance and multi-drug resistance
- Comparisons of AMR across animal and bacterial species should not be attempted

Summary: Considerations regarding AMR outcomes in food animals
- Qualitative (R/S), semi quantitative (MIC), Quantitative (actual counts)
- We need to consider where the sample came from
- We should differentiate between “immediate” and “long-term” effects of antimicrobial drug use and AMR when discussing “cause and effect”
- Methods used for bacterial isolation, MIC determination, breakpoints, type of animals sampled, number of isolates used per animal, study and sampling designs etc. vary too much across studies

Responsible Antibiotic Use Practices in U.S. Pork Production
Jennifer Koeman, DVM, MPH, Director of Public Health, National Pork Board

Summary: U.S. pork producers are committed to produce safe food and contribute to public health. Appropriate use of antibiotics is an important part of this commitment. Pork Quality Assurance (PQA) participation by producers includes the proper use of antimicrobials in its package of practices to produce safe food and provide for animal welfare.

Take Care Program: Following the launch in 2005, the program gained widespread acceptance. Today, more than 50 million pigs are marketed by producers who have signed an endorsement which pledges their commitment to protecting public health, animal health and well-being through the responsible use of antibiotics. With the incorporation of the Take Care principles and guidelines into the PQA Plus program, the program it is
expected to become an industry standard observed by virtually all U.S. pork producers. During the development of the program, producer focus groups were used to help define the principles and guidelines, the scope of the program, delivery methods for the program and even the name. Following the launch of the program, the National Pork Board initiated and funded a pilot project study that is in process today. Ten veterinary clinics are involved, two each in five states: Minnesota, Iowa, Illinois, Missouri and Indiana. Each veterinary clinic is overseeing five producers with approximately 250,000 hogs involved. Three of the five producers have received training on the Take Care Program and two of the producers have not. The goal of the pilot project is to determine the effectiveness of the program in raising awareness and knowledge of the responsible use of antibiotics. The findings of the pilot project will be presented at upcoming industry meetings and through articles in scientific and agricultural publications. For more information or to request a manual, producers can call 1-800-456-PORK or visit pork.org. Producers are also encouraged to work with their veterinarians to implement the program on their operations.

Food and Drug Administration (FDA) Center for Veterinary Medicine (CVM) Update on Food Safety Modernization Act, Salmonella and the Veterinary Feed Directive
Burt Pritchett, DVM, Food and Drug Administration

Summary: Spoke about the Food Safety Modernization Act (FSMA). Facilities which handle foods will be required to analyze and define the hazards that exist on their premises and develop a plan to reduce or eliminate them. FDA now has authority to mandate recalls, but intend to continue the collaborative, voluntary process except in cases where it does not work. Imported food products will be required to meet the same safety standards as domestic products. Federal, state and local partners will be used to accomplish the goals of FDA under FSMA. Requirements will apply to all human and animal foods except seafood, meat and poultry, and those foods already under mandatory Hazard Analysis and Critical Control Points (HACCP). FDA is currently developing a package of rules to implement the Act.

FDA’s Implementation Priorities for the FSMA: Based on public health impact, focus on:

- Prevention
  - Mandatory preventive controls for facilities (FR 18 months)
  - Produce safety standards (FR 2 years)
  - Intentional contamination (FR 18 months)
- Inspection, Compliance, and Response
  - Administrative detention (IFR 120 days)
  - Recall (Upon enactment)
  - Suspension of registration (180 days)
FOOD AND FEED SAFETY

- Imports
  - Foreign supplier verification program (Guidance and FR 1 year)
  - Accredited third-party certification program (FR 2 years)
  - Mandatory certification for high risk foods (upon enactment)

For more information on the FSMA: http://www.fda.gov/fsma or www.FDA.gov (link is in the box called Public Health Focus).

Compliance guide on Salmonella in feed; definition of feed by intended use:
- Direct human-contact feeds
  - pet foods, pet treats, petting zoos, agricultural fairs
- Feeds intended for use on farms
  - cattle ranches, dairy farms, poultry farms, swine farms

Salmonella Serotypes of Health Concern to Target Animals

<table>
<thead>
<tr>
<th>Type of Feed</th>
<th>S. Serotype</th>
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<tbody>
<tr>
<td>Poultry feed</td>
<td>Pullorum/Gallinarum/Enteritidis</td>
</tr>
<tr>
<td>Swine feed</td>
<td>Choleraesuis</td>
</tr>
<tr>
<td>Sheep feed</td>
<td>Abortusovis</td>
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<tr>
<td>Horse feed</td>
<td>Abortusequi</td>
</tr>
<tr>
<td>Dairy and beef feed</td>
<td>Newport/Dublin</td>
</tr>
<tr>
<td>Milk replacer</td>
<td>Any serotypes</td>
</tr>
</tbody>
</table>

Draft Guidance: “The Judicious Use of Medically Important Antimicrobial Drugs in Food-Producing Animals”
- Provide for the safe use of antimicrobials in food animals while ensuring that important human antimicrobial therapies are not compromised or lost.
- Discusses FDA’s concerns with the use of medically important drugs in food-producing animals and impact on antimicrobial resistance.
- Two key principles outlined in draft guidance #209:
  1) Limit use of medically important antimicrobial drugs to uses considered necessary for assuring animal health (i.e., therapeutic purposes)
  2) Production use is not a judicious use
Veterinary Oversight:
- Currently, most feed and water use antimicrobials are available over the counter (OTC)
- Currently working with AVMA steering committee on practical implications for increasing veterinary oversight
- How to define “VCPR”?
- Advice on improving VFD process

Summary of Overall Strategy
- For medically important antimicrobial drugs:
  - phase out production uses and
  - phase in greater veterinary oversight
- Phased in strategy important for assuring that animal health needs are met, veterinary practice issues are addressed, and impacts on industry are minimized

At this time, focus is on a voluntary approach for making changes to currently approved products.

USDA-FSIS Food Safety Strategy Update and Regulatory Perspectives
Dan Engeljohn, BS, MS, PhD, Assistant Administrator, Office of Policy and Program Development, U.S. Department of Agriculture Food Safety and Inspection Service

Summary: Daily inspection requirement in statute limits the inspection options of FSIS. Both Campylobacter and Salmonella continue to be difficult challenges to control, especially in poultry. Protecting public health remains the primary goal of the Agency. Described the Agency Strategic Plan designed to accomplish the goal of safe food under existing inspection mandates and limited budgets. Will publish major new poultry inspection regulation this fall. Also will publish new egg products inspection rule. Will redefine what constitutes a repeat violative drug residue seller. Will consider petitions this fall with regard to slaughter of downer animals of any species and the slaughter of veal calves in poor state of health. Conference on on-farm beef safety is set for Nov. 9, 2011, at the APHIS office in Riverdale, MD.

Three major themes with eight goals to engage FSIS employees in preventing foodborne illness and to be a more trusted and successful public health regulatory agency; budget and resources are directly tied.
- Themes:
  - Prevent foodborne illness
  - Understand and influence the farm-to-table continuum
  - Empower people and strengthen infrastructure
- Goals:
  - Ensure that food safety inspections align with existing and emerging risks
  - Maximize domestic and international compliance with food safety practices
FOOD AND FEED SAFETY

- Enhance public education and outreach to improve food handling practices
- Strengthen collaboration among internal and external stakeholders to prevent foodborne illness
- Effectively use science to understand foodborne illnesses and emerging trends
- Implement effective policies to respond to existing and emerging risks
- Empower employees with the training, resources, and tools to enable success in protecting public health
- Based on defined agency business needs, develop, maintain, and use innovative methodologies, processes, and tools, including Public Health Information Systems (PHIS), to protect public health efficiently and effectively and to support defined public health needs and goals

USDA-FSIS Substantive Initiatives in 2012:
- Prevention of contamination during slaughter/dressing proposed rule (beef)
- Poultry slaughter proposed rule
- Implementation of Campylobacter standard – poultry carcasses
- Processed egg product HACCP/SSOP proposed rule
- Validation
- Trace back
- Drug residues – targeted testing
- *Salmonella* multi drug-resistance (ground poultry and ground beef)
- Humane handling petitions – Farm Sanctuary (all), HSUS (veal)
- Non O157 STEC adulteration implementation
- Labeling: Enhanced; natural; nutrition labeling of single ingredient product (final rule implementation); mechanically tenderized beef
- Catfish
- Pre-harvest workshops – start with cattle (November)

Committee Business

Chair Dr. Buntain called the meeting to order at 4:45 p.m. Quorum was not present with nine members attending. The Committee Charge was reviewed and there were no suggestion for revising the Charge. Next, the process of resolution was mentioned. No resolutions were submitted by the members or another committee to this Committee. The Chair asked if there is any other business to bring forward and there was none. The Chair was complimented on the program content. She asked for suggestions for topics on the next meeting. Recommendations for next year’s meeting included: Explore linking with AAVLD Food Safety Committee as suggested by Chair Buntain who attended that Committee; theme of MRSA (Multi-drug resistant staph aureus) which is a hot topic at infectious disease conferences;
suggested rotating themes on foodborne pathogens such as overview of non E. coli O157:H7 STECS; and import food safety and international food safety issues. The meeting was adjourned at 5:00 p.m.
REPORT OF THE COMMITTEE ON FOREIGN AND EMERGING DISEASES

Chair: Paul Gibbs, FL
Vice Chair: Tammy Beckham, TX

John Adams, VA; L. Garry Adams, TX; Bruce Akey, NY; Wilbur Amand, PA; Gary Anderson, KS; Joan Arnoldi, WI; Marianne Ash, IN; George Badley, AR; Lisa Becton, IA; Derek Belton, NZL; Bob Bokma, MD; Philip Bradshaw, IL; Richard Breitmeyer, CA; Deborah Brennan, GA; Becky Brewer-Walker, AR; Corrie Brown, GA; Dawn Bueschel, NM; Suzanne Burnham, TX; Jerry Callis, NY; Jon Caspers, IA; Tony Caver, SC; Nancy Chapman, MD; Gregory Christy, FL; Neville Clarke, TX; Matt Cochran, TX; Leslie Cole, OK; Jim Collins, GA; Thomas Conner, OH; Joseph Corn, GA; Paula Cowen, CO; Stephen Crawford, NH; Debbie Cunningham, OK; Glenda Davis, AZ; Donald Davis, TX; Ignacio dela Cruz, MNP; Thomas DeLiberto, CO; Linda Detwiler, NJ; Leah Dorman, OH; Barbara Drolet, KS; Edward Dubovi, NY; Anita Edmondson, CA; Brigid Elchos, MS; Dee Ellis, TX; Francois Elvinger, VA; John Enck, PA; J. Pat Fitch, MD; James Foppoli, HI; Rose Foster, MO; W. Kent Fowler, CA; Richard French, NH; Anthony Gallina, FL; Jane Galyon, IA; Tam Garland, TX; Cyril Gay, MD; Dorothy Geale, ON; Robert Gerlach, AK; Colin Gillin, OR; Linda Glaser, MN; Stephen Goldsmith, VA; Robert Ross Graham, VA; Nancy Halpern, NJ; Jeffrey Hamer, PA; James Mark Hammer, NC; Cathleen Hanlon, NY; William Hare, MD; David Harlan, MN; Larry Hawkins, MO; Greg Hawkins, TX; Rudolf Hein, DE; Jan Hershenson, CA; Richard Hesse, KS; Linda Hickam, MO; Rick Hill, IA; Donald Hoenig, ME; Sam Holland, SD; Thomas Holt, FL; Floyd Horn, MD; Dennis Hughes, NE; Pamela Hullinger, CA; John Huntley, WA; Carla Huston, MS; John Hyde, NY; Thomas Kasari, CO; Hailu Kinde, CA; Gary Kinder, WV; Bruce King, UT; Paul Kitching, CAN; Patrice Klein, MD; Anthony Knight, CO; Charlotte Krugler, SC; Elizabeth Krushinskie, DE; Elizabeth Lautner, IA; John Lawrence, ME; Randall Levings, IA; Tsang Long Lin, IN; Martha Littlefield, LA; Linda Logan, TX; Francine Lord, CAN; Margie Lyness, GA; Janet Maass, CO; Edward Mallinson, MD; Bret Marsh, IN; Barbara Martin, IA; Michael Martin, SC; Sarah Mason, NC; Todd McAloon, MN; Thomas McGinn, III, DC; Thomas McKenna, WI; David Meeker, VA; Gay Miller, IL; Ricardo Munoz, TX; Thomas Myers, DC; Lee Myers, GA; Sandra Norman, IN; James Novy, TX; Kristy Pabilonia, CO; Lanny Pace, MS; Charles Palmer, CA; Elizabeth Parker, DC; Michael Parker, DC; William Parker, GA; Boyd Parr, SC; Holly Poremmski, TX; Tom Ray, NC; Keith Roehr, CO; James Roth, IA; Emi Saito, CO; Mo Salman, CO; John Sanders, WV; A. David Scarfe, IL; Shawn Schafer, ND; Jack Schlater, IA; David Schmitt, IA; John Shaw, DOM; Marilyn Simunich, ID; Jonathan Sleeman, WI; Harry Snelson, NC; Rosemary Speers, VA; Katie Steneroden, CO; Nick Striegel, CO; Seth Swafford, MO; David Swayne, GA; R. Flint Taylor, NM; David Thain, NV;
The Committee met on Oct. 4, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 8:00 a.m. to 6:45 p.m. There were 154 members and guests present. Dr. Paul Gibbs welcomed the Committee and guests and reviewed last year’s Committee agenda.

Time-Specific Paper
Dr. Juan Lubroth, Chief Veterinary Officer of the Food and Agricultural Organization, Rome, Italy presented a time-specific paper on the Prospects for Eradication of FMD. A summary of the paper is included at the end of this report.

Section I:
Special Focus: Foot and Mouth Disease and Vaccination (FMD)

Responding to Foot and Mouth Disease: The Changing Landscape
John Clifford, Deputy Administrator, USDA APHIS

Dr. Clifford remarked that the agricultural landscape is vastly different than 82 years ago, when the last case of FMD was detected in 1929. Concentrated livestock operations may increase the risk of rapid disease spread and the mobility of animals, animal products and human traffic from endemic FMD areas has increased dramatically. The consequences of an FMD outbreak make this as much an economic disease as it is an infectious disease. Export markets for all animal commodities would close for an indeterminate time and we would suffer commodity price reductions. Traditional stamping out and disposal regulations can no longer be achieved because the current livestock herd numbers can be in thousands. These measures focus exclusively on stamping out without the use of vaccine. APHIS’ plans for responding to an outbreak consider the use of animal-sparing modalities such as vaccination early in process. Depopulation and disposal must be minimized to conserve resources, protect the environment and ensure domestic food requirements are met. To respond to an FMD outbreak, APHIS has developed the Foreign Animal Disease Preparedness and Response Plans (FAD PReP). FAD PReP is a suite documents with guidelines, plans and standard operating procedures for disease response.
FOREIGN AND EMERGING DISEASES

These documents provide the framework for APHIS’ preparedness and response. APHIS has also prepared the National Animal Health Emergency Management System (NAHEMS) guidelines on specific response activities. Modern challenges require a new approach for responding to an outbreak such as FMD, APHIS will need to consider all available options and use multiply strategies to address an outbreak. We must take a balanced approach to disease containment by establishing a nationally accepted continuity of business programs well in advance of the outbreak to ensure an uninterrupted food supply and sustain commerce.

Foot-and-Mouth Disease Vaccines: Past, Present and Future
Luis Rodriguez, Research Leader, Plum Island Animal Disease Center, USDA ARS

This presentation provided a brief history of FMD vaccine production and a look into the future FMD vaccines with a goal towards eradication of FMD virus. A description of the current FMD vaccine production processes was provided. Binary Ethylenimine (BEI) inactivated vaccines can take up to six months to produce. BEI inactivated vaccine production requires cell adaptation and subsequent inactivation steps. Emergency use vaccines are prepared to twice the potency of routine vaccines. Typical onset of protection from current inactivated vaccines is between 7-10 days post immunization. Immunity is short-lived (< 6 months) and it is difficult to differentiate vaccinated vs. infected animals. The ideal vaccine would have the following characteristics: 1) provide effective, rapid and long lasting immunity; 2) prevent viral transmission; 3) allow for differentiation of vaccinated vs. infected animals; 4) prevent carrier state; 5) provide protection against multiple serotypes; and 6) be stable with a long shelf life. There are effective subunit vaccines that have been tested in livestock. The newly developed adenovirus vaccine (by Dr. Marvin Grubman) can be manufactured in the U.S., is capable of differentiating infected animals from avaccinated animals (DIVA), and provides immunity within 7-14 days post vaccination. New research is currently underway on FMD vaccines that are attenuated and will likely provide long term immunity. There is a need for vaccines that are inexpensive to produce, easy to deliver and induce long-term immunity. Also there is need for better integrated strategies that fit the specific needs of endemic regions. Only when these critical components are available will the global eradication of FMDV be possible.

Industry Perspectives on Foot-and-Mouth Disease Vaccines

Merial and Foot- and- Mouth Disease Vaccines
Francis Milward, Senior Director Biological R&D

Dr. Milward reported that Merial is an innovation-driven leader in the delivery of Animal Health products and solutions. Merial has a global
presence with 5,600 employees, nine Research Centers and 16 Production Facilities. The origin of Merial’s vaccine business goes back to the very beginning of the history of Foot and Mouth Disease vaccines (the Waldman method) and has evolved with every generation of technology (Frenkel, Cell line derived purified) since. The great majority of vaccines used world-wide are derived from inactivated virulent Foot and Mouth Disease Virus. Depending on the region, they are used for systematic vaccination of livestock, vaccine banks and emergency use to control outbreaks. The next frontier is the availability of recombinant vaccines that do not require the handling of the Foot and Mouth Disease virus (low-biosecurity vaccines). While many technologies have been tried to date the reduction to commercial availability has been very limited. A new generation of technologies is showing promise. We will show an example using the Adenovirus expression system from Genvec, developed in collaboration with the United States Department of Agriculture and the Department of Homeland Security. A clear understanding of the desired product definition and the expectation of future needs for Foot and Mouth Disease vaccines in the United States will be critical for their successful development and importantly industrial availability when needed.

Key Aspects for a Successful Control of FMD by Vaccination
Eliana Smitsaart, Ana María Espinoza, and Rodolfo Bellinzoni BIOGENESIS-BAGO S.A, Argentina

Dr. Smitsaart reported that Foot and Mouth Disease (FMD) is a highly infectious viral disease that affects food producing animals such as cattle, pigs and sheep. The rapid spread of the disease constitutes a continued threat for the economy of meat exporting countries. After the UK 2001 epidemics in which large numbers of animals were slaughtered, there is a growing awareness of the benefits of using vaccination as a major tool, in conjunction with other measures to contain outbreaks. Current FMD vaccines follow essentially classical steps of antigen production and formulation with appropriate adjuvants. The inclusion of purification steps alongside compliance with GMP standards enables the production of a consistent and well characterized high-quality product.

In addition, availability of high quality antigens allows the conservation of strategic reserves to be formulated into vaccine in case of an emergency. Potency, safety and purity regarding removal of nonstructural proteins (DIVA capability) are essential attributes that are assured by the manufacturer and verified by official external controls in South America. These elements guarantee consistencies in the quality of the product available for vaccination campaigns or in an emergency context. The control of FMD in Argentina and Uruguay, in 2000-2001 demonstrated the effectiveness of vaccination.
Preparedness for Emergency Vaccination against Foot and Mouth Disease (FMD)
Mike Bolton, Technical Service Specialist, Merck, Inc.

Dr. Bolton outlined that Merck has FMD vaccine manufacturing facilities in Brazil, India and Germany. The OIE/FAO World Reference Laboratory (WRL) in Pirbright, UK, monitors the global situation. Based on the epidemiological situation WRL publishes a priority list for FMD strains in vaccine/antigen banks. Merck is in close contact with WRL and exchanges information and samples on the FMD vaccine strains with WRL. Matching between vaccine strains and field strains is done through a serological test, based on post-vaccination sera and the field isolates, which results in an r-value. Protection against a virus depends on a combination of the r-value and the potency of the vaccine. The trend in r-values is more important than an individual value.

Some Considerations for the Development of a FMD Vaccination Plan
Pam Hullinger, Associate Clinical Professor, UC Davis, College of Veterinary Medicine; and Dr. Annette Whiteford, State Veterinarian and Director, Animal Health and Food Safety Services, California.

The presentation provided an overview of considerations for the development of a FMD vaccination strategy and the successful execution of that plan. Lessons learned from a recent California field level operational exercise focused on delivery of FMD vaccine to the dairy industry were highlighted. There are many factors and considerations to be taken into account when selecting a response strategy in the face of an FMD epidemic. While each event will be unique in location, species and industries impacted and the manner in which it unfolds, working through and discussing approaches by state or region in advance of an event should put us in a position to make better informed and more timely decisions in a real event. There are several key areas where more information and preplanning can have significant impacts. The two highlighted in this presentation are first having a better understanding of the impacts on markets and commerce, both domestic and foreign. While both are important, we have more control over our domestic markets and interstate commerce and need to discuss openly what states or industries thoughts and expectations are in regards to enabling “continuity of business” for those unaffected premises in proximity to known areas of infection. Second, we need a better understanding of U.S. consumer acceptance of products from FMD vaccinated animals. While we can all acknowledge that these products are completely safe and healthy, we need to understand if there may be consumer concerns and if so, how to best manage or mitigate them through preplanned messaging.
REPORT OF THE COMMITTEE

Pork Industry Perspective of FMD Vaccination
Patrick Webb, Director of Swine Health Programs, National Pork Checkoff
Board, Des Moines, Iowa

Dr. Webb considered that vaccination is a tool that should be used in an outbreak depending on the scope of the outbreak. Determining the scope of the outbreak will be essential and require speed and the ability to have premise and tracing capabilities. Epidemiologic information will help make decisions for vaccination. Once an outbreak occurs, there will be a need to determine which species are vaccinated, how many doses are needed and the frequency of administration. In order to have adequate administration, swine veterinarians and industry partners will need to be involved. There is a need to understand how vaccination will affect interstate commerce and consumer acceptance of products.

Cattle Industry Perspective of FMD Vaccination
Elizabeth Parker, Chief Veterinarian, National Cattlemen’s Beef Association

Dr. Parker pointed out that the end goal for vaccination is rapid control and eradication. The country needs a vaccination plan that provides an effective, reputable, thorough, traceable, and auditable vaccination for proof for domestic and international trade. While there have been recent forward strides regarding FMD vaccines, we still need a DIVA vaccine that allows for an effective “vaccinate to live” or “vaccinate to slaughter” policy without jeopardizing trade and potential silent carriers. The logistics of vaccine receipt, staging, storage and distribution of vaccine are a challenge. We will need to balance available manpower with minimum amount of people due to biosecurity concerns while ensuring a rapid deployment and administration of vaccine. Additional logistical issues beyond administration include: ensuring we have adequate paper trail, identification of vaccinated animals, resource needs for effective vaccine delivery & distribution, producers with multi-species on their operation and diversity of the cattle industry.

Wildlife and Foot and Mouth Disease
Jack Rhyan, APHIS, USDA

Dr. Paul Gibbs presented the report for Dr. Rhyan. The only known occurrence of foot-and-mouth disease in wildlife in the United States occurred in 1924 when the infection was transmitted from cattle to mule deer (*Odocoileus hemionus*) sharing common pasture. In an experimental infection in the 1970’s, white-tailed deer (*Odocoileus virginianus*) were susceptible to infection and capable transmitters of the virus to cattle. More recent studies in North American bison (*Bison bison*), elk (*Cervus elaphus nelsoni*), pronghorn (*Antilocapra americana*), and mule deer have been conducted. Results of these studies indicate the susceptibility and transmission capability of three of the four wild ungulate species examined. Additionally, the severity of lesions in pronghorn and mule deer suggests that in a natural outbreak, mortality could be high. Results also indicate some resistance of elk to transmission and severe clinical signs when infected with
FOREIGN AND EMERGING DISEASES

FMD type O1 Manisa. A separate study recently conducted by investigators from PIADC and APHIS-Wildlife Services evaluating FMD in feral swine found results and lesions of the disease to be similar to those in domestic pigs. Further studies to develop and evaluate vaccination strategies and vaccines for use in wildlife are needed.

Section II: Federal, State and Academic Updates:

DHS Update
Michelle Colby, Branch Chief, Agricultural Defense Branch, Chemical and Biological Defense Division, Department of Homeland Security (DHS) Science and Technology Directorate

This presentation provided an update on recent activities within the Department of Homeland Security’s Science and Technology Directorate related to foreign animal disease (FAD) countermeasures. This included progress reports on the development of the adenovirus vectored Foot and Mouth Disease (FMD) vaccine and the Agricultural Screening Tools project.

NVSL Update
Beth Lautner, Director, National Veterinary Services Laboratories, USDA APHIS

This presentation provided an update of activities within the National Veterinary Services Laboratories (NVSL) at Ames, Iowa. The NVSL priorities for fiscal year 2011 were reviewed. These priorities included:

- Increasing science focus
- Expanding ISO accreditation to proficiency panels and reference materials
- Optimizing and utilizing lims
- Maintaining and expanding domestic reference laboratory role
- Maintaining and expanding international reference laboratory role
- Positioning NVSL for 2015
- Leading laboratory networks
- Improving workplace environment
- Supporting the nbaf design and transition
- Improving emergency preparedness. The NAHLN strategic planning initiative was reviewed along with the concept paper and survey results.

FADDL Update
Fernando Torres-Velez, Section Head, Diagnostic Services Section, Foreign Animal Disease Diagnostic Laboratory (FADDL), NVSL, USDA APHIS, Plum Island animal Disease Center

The “State of FADDL” was reviewed in this presentation. The domestic accessions and surveillance activities performed during the past year was reviewed. FADDL has been active in producing proficiency panels and
performed negative cohort studies for FMD, Rinderpest and African Swine Fever (ASF). Current and future diagnostic development and validation projects were provided. FADDL has been very active in international projects to include work in Haiti, Ecuador, Mongolia and the Dominican Republic. The future direction of FADDL will involve strengthening the diagnostic capacity, establishing OIE reference laboratory status for FMD, continue to grow international collaborations and continued support for the NAHLN.

**USDA-ARS Update**

Luis Rodriguez, Research Leader, Foreign Animal Disease Research Unit, USDA-ARS, Plum Island Animal Disease Center

A review of the current financial status and Current Research Information System (CRIS) projects for Agricultural Research Service (ARS) was provided to the Committee. During 2012-2017 the projects include: intervention strategies to support the global control and eradication of fmd; countermeasures to control foreign animal diseases of swine – Classical Swine Fever (CSF) and African Swine Fever (ASF); and ecology and pathogenesis of re-emerging vesicular stomatitis virus in North America. An overview of ASF and CSF and the current research gaps was provided.

**CEEZAD Update**

Igor Morozov, Science Project Manager, Center for Excellence for Emerging and Zoonotic Animal Diseases (CEEZAD), Kansas State University

Dr. Morozov explained that CEEZAD is a component of the Zoonotic and Animal Disease Center supported by the Department of Homeland Security (DHS) and was founded in 2010. An overview of the research and education programs was provided to the Committee. CEEZAD performs work in three areas: 1) vaccines, 2) detection, and 3) epidemiology, education and outreach. Current vaccines in development are recombinant/MLV vaccines for Rift Valley Fever and Influenza. Work in pathogen detection includes development of a multiplexed assay that includes 15 targets.

Epidemiological studies are underway in various regions to ascertain risk level and exposure to Rift Valley Fever. The State of Kansas has provided matching funds to allow for additional projects within each theme.

**FAZD Update**

Tammy Beckham, Director, Department of Homeland Security Foreign Animal and Zoonotic Disease Defense Center

Highlights from the previous year’s work within the FAZD Center were provided to the Committee. Highlights included: 1) two agricultural screening tools workshops in collaboration with the Science and Technology directorate of DHS, USDA, and the livestock industries; 2) information analysis tools to support business continuity planning and emergency response; 3) development and pilot of the NAHLN capacity software model; 4) continued development and testing of a deletion NSm MP-12 RVF vaccine candidate; 5) development of monoclonal antibodies to FMD for use in DIVA.
assay in collaboration with Plum Island and an industry partner; and 6) continued expansion of the career development programs.

NAHLN Update
Sarah Tomlinson, Associate Coordinator, National Animal Health Laboratory Network (NAHLN), Fort Collins, Colorado

Dr. Tomlinson reported that APHIS partners with veterinary diagnostic laboratories throughout the United States to ensure there is adequate diagnostic capacity and capability for early detection of, rapid response to, and recovery from, animal health emergencies. This includes emerging diseases and FAD agents that threaten the Nation’s food supply and public health. NAHLN is comprised of 55 State/university laboratories and four Federal laboratories including: the Department of Interior (DOI) laboratory in Madison, Wisconsin; the USDA, Food Safety and Inspection Service (FSIS) laboratory in Athens, Georgia; and the National Veterinary Services Laboratories (NVSL) in Ames, Iowa and Plum Island, New York locations, for a total of 59 laboratories in 43 States. NVSL serves as the national reference laboratory for the NAHLN. NAHLN has been involved in multiple preparedness activities in 2011 including: completing the FMD exercise series; developing of a secure communication platform with stakeholders using CoreShield; collaborating with FAZD to develop a laboratory capacity estimation model; and participating in FAZDs Agricultural Screening Tools workshops. Additionally, NAHLN provided multiple Quality Assurance (QA) trainings, including delivery to Plant Protection and Quarantine (PPQ) and international participants; and is developing QA distance training modules. NAHLN continues to be involved in diagnostic development activities such as: completion of negative cohort studies for FMD, ASF and RP; collaborating with FADDL and FAZD on the evaluation of a FMD lateral flow device and additional partners on the optimization of techniques for an FMD milk assay. Further, stakeholders have participated in NAHLN strategic planning by providing input on network structure options.

Session III: Contributed Papers

Global Eradication of Rinderpest, What’s Next?
William Taylor, FAO Technical Expert, Rome, Italy

Dr. Taylor explained that the global eradication of rinderpest, as opposed to simply controlling disease, produced a better return on investment costs. Now that we understand that current vaccine-driven technology can lead to such an event, we should look for fresh diseases in which to make similar investments. At a technical level we should be looking for diseases with straightforward epidemiological profiles and with simple immunological host responses. Peste des petits ruminants (PPR) can be taken as a case in point. The disease is easily recognized clinically and has a defined global distribution within which the virus only affects sheep, goats and camels.
Wildlife reservoirs do not exist. Live attenuated vaccines conferring a durable immunity have been developed and in endemically infected countries, vaccination is the control approached normally taken. It is proposed that by increasing the level of vaccine uptake to saturation point, eradication would be achieved. Estimations of the global requirements of vaccine compared to the availability of vaccinators suggest that the “choke point” at present relates more to vaccine production than manpower. Finally, a draft time-bound scheme is proposed whereby improved vaccine output could lead to a possible reduction or even eradication of the virus through two rounds of mass vaccination with the further possibility of focused intensive vaccination of residual pockets of infection. This would have to be accomplished within a suitably coordinated geopolitical framework.

**USDA-DOD Collaborative Engagement to Prevent and Mitigate threats from Especially Dangerous Pathogens**

Ned Cardenas, Animal Health Technical Advisor, Foreign Agricultural Service, Washington, DC

Dr. Cardenas explained that in this time of diminishing budgets and increasing deficits, governments must be creative in achieving their mission with limited resources. The United States Department of Agriculture (USDA) needs to increase collaboration with other government institutions to reach mutual goals. The overall mission of the USDA is to protect and promote U.S. food, agriculture, natural resources and related issues. To achieve this mission, USDA maintains a skilled workforce in the area of infectious animal diseases from which to draw technical expertise to support the President’s National Strategy for Countering Biological Threats.

USDA partners with other U.S. institutions and departments [U.S. Agency for International Development (USAID), Department of State, Department of Defense, etc.] to engage national veterinary services in program countries on training, cooperative biological research, threat agent detection and response activities. There are many animal diseases that cross borders and pose risks to the health and value of U.S. agriculture. USDA mitigates some of these risks by collaborating in research and engaging in capacity building activities internationally. There are three USDA agencies actively involved in these programs. These are the Animal and Plant Health Inspection Service (APHIS), the Agriculture Research Service (ARS) and the Foreign Agriculture Service (FAS). These agencies represent USDA’s main capacities for research (ARS), animal and plant health regulatory authority (APHIS) and international diplomacy (FAS) related to animal diseases. Examples of activities that have been implemented or are in planning stages are scientific exchanges, embassy science fellows, in-country post graduate scholarships, collaborative research, in-country and U.S.-based short courses on transboundary animal diseases, biosafety and biosecurity, laboratory diagnostics and quality management, basic and advanced veterinary epidemiology and risk analysis.
FMD Vaccinate to Live: “What’s the Problem?”
Dorothy Geale, Senior Staff Veterinarian, Canadian Food Inspection Agency

The FMD Chapter in the OIE Terrestrial Animal Health Code presents a significant disincentive to adopt vaccinate-to-live strategies in countries classified as **FMD free where vaccination is not practised**. The Code differentiates between eligibility to return to the previous status as 3 months when vaccinates are slaughtered (vaccinate-to-die) compared to 6 months where vaccinate-to-live policies are applied. This doubling of the period of trade restriction is a considerable economic barrier. To this end in April 2011, the QUAD (Australia, Canada, New Zealand and the United States) Chief Veterinary Officers tasked a project to explore the scientific rationale that could support a proposal that the period for return to a previous status following an outbreak where stamping-out is applied should be 3 months, irrespective of whether vaccinate-to-live or vaccinate-to-die policies are applied. The project is designed to examine the premise that with appropriate response measures, particularly the use of high quality emergency vaccines and enhanced surveillance, along with strict movement control, animal identification and traceability among others, a vaccinate-to-live versus a vaccinate-to-die policy in countries or zones classified as **FMD free where vaccination is not practised** (i.e. not practiced when FMDV is not present in the country) can be considered equivalent in terms of risk to animal health and should therefore have identical periods of exclusion from international trade.

Timelines and deliverables of the project include a scientific review of pertinent literature, formulation of a position to support concurrence of times for return to trade and if warranted development of proposed text for submission to the OIE Code Commission in September 2012.

The OIE/FAO World Reference laboratory for FMD at Pirbright, UK and the EUFMD Commission are collaborating in the project.

Hemispheric Program for the Eradication of FMD (PHEFA)
John Shaw reported for Dr.Sharon Williams, USDA-APHIS International Services, Rio de Janeiro, Brazil.

Dr. Williams reported that the major progress has been made in eradicating FMD from South America. Stubborn pockets of endemicity remain, notably in Ecuador and Venezuela. Until the recent confirmation of FMD in Paraguay, 85% of South America’s cattle resided in areas free of disease with or without vaccination. This overall success has led to a hemispheric program for the eradication of FMD with a target of eradication being achieved by 2020. PANAFTOSA (Pan American FMD Center) has been charged with leading the effort. The program is explicit that different zones in South America are at different places with different risks. As an example, the activities needed to bring Ecuador from being an endemic country to one free with vaccination are different from those needed to move Argentina from free with to free without vaccination. Dr. Williams concluded
by drawing attention to the significant financial constraints on the continent. However, the scientific know-how is available to eradicate FMD from the Americas and the globe. It's almost down to a clean up job now in South America, with predominately Type O virus circulating in a limited number of nidi. At least, in theory, there is no technical reason we should not be able to eradicate this disease.

**Emergency Response Support System**

Jim Wall, Director, Computing and Information technology for the Texas Center for Applied technology

Dr. Jim Wall provided an overview of a dashboard technology currently being developed for National Center for Animal Health Emergency Management (NCAHEM) and emergency response. Dr. Wall reviewed developments to date and capabilities of the technology. Applications to date for this technology include the development of the emergency response support system, the NAHLN capacity software estimator and the Biosurveillance field entry system.

**Recent Outbreaks of FMD in Japan**

Dr. Ruri Ushijima, Post-doctoral Associate, University of Miyazaki, Japan

Dr. Ushijima reported that on March 25, 2000, the first case of foot-and-mouth disease (FMD) in Japan in 92 years was diagnosed in Miyazaki Prefecture. By May 11 three other infected herds were identified by surveillance at local and national levels. A serotype O strain was the cause of the epidemic, and investigations suggested that the first case could have been linked to use for feed and bedding of imported wheat straw from China, but this was never confirmed. Containment, control, and eradication using stamping-out without vaccination was achieved on May 18. The 2000 outbreak resulted in destruction of 740 cattle within 4 infected herds. The estimated cost to the government and economy was approximately 100 million U.S. dollars. Late April and extending through July of 2010, Japan experienced another FMD epidemic caused by the serotype O strain, located 75 kilometers north of the 2000 FMD outbreak. The first case was found April 20 at a small cattle breeding farm within Miyazaki prefecture, and all 292 cases were detected within the prefecture by July 4. More than 10 farms had already been infected by the time the first case was detected. A rapid increase in cases in early May triggered use of an emergency ‘vaccination-to-kill’ policy. Altogether, 125,668 animals were vaccinated (Merial, Aphtopor®/O1-Manisa) between May 22 and May 30. All suspected and vaccinated animals were destroyed by June 30.

Clinical signs in cattle were: fever (88%), foamy salivation (95%) and vesicular/erosive/ulcerative lesions on the tongue (86%), gingiva (91%) and internal nares (72%). Clinical signs in pigs were: fever (80%), vesicular and erosive lesions on the feet (93%) and the nose (94%), and lameness (52%). High mortality of newborn piglets was observed in 7% of affected pig farms. No evidence of virus (PCR) or antibodies (ELISA) was found for samples.
from 79 wild animals. Although the source of FMD infection of the outbreak has not been identified, partial sequencing by FMD World Reference Lab of the outbreak strain of the virus (O/JPN/2010) suggests that it is closely related to viruses occurring recently in the P.R. China, Hong Kong SAR, Republic of Korea, Myanmar and Thailand. Immediate losses included destruction of 288,643 animals in 292 herds (196 cattle, 82 swine, 13 mixed and 1 goat) and a long term cost of $3 billion (U.S.) projected over the next 5 years. These epidemics highlight Japan’s vulnerable location for acquiring FMD from neighboring countries where FMD is endemic.

**Classical Swine Fever in the Caribbean**

John Shaw, USDA-APHIS

Classical Swine Fever is a disease which still affects two of the Greater Antilles [Cuba, and Haiti and the Dominican Republic (Hispaniola)]. The histories of these diseases and indeed their virus lineages are quite different. The three countries face many challenges in their efforts to control and eradicate this disease, and each case is different due to the different roles government and the private sectors play. International cooperation has been the key to some aspects of these programs. New technology in the form of conventional PCR is being implemented successfully in some programs but not in others. Many distinct challenges remain and APHIS continues to assess the risk to insular and mainland U.S.

**Committee Business**

The Committee reviewed and passed one resolution, titled “Funding for Defense of the United States Agriculture and Food.”
REPORT OF THE COMMITTEE

PROSPECTS FOR THE GLOBAL ERADICATION
OF FOOT-AND-MOUTH DISEASE

Juan Lubroth
Chief Veterinary Officer, Animal Health Service
Food and Agricultural Organization (FAO), Rome, Italy.

Giancarlo Ferrari, Keith Sumption, Julio Pinto, and Peter de Leeuw are gratefully acknowledged for inputs into the FMD progressive control pathway.

Summary
Globally, more than 120 countries remain affected by foot-and-mouth disease (FMD). Efforts for the prevention and elimination of FMD from the livestock sector are too often thwarted from re-incursions and a poor understanding of the negative socio-economic impact of the disease, reflected in low investments in endemic settings. The Food and Agriculture Organisation (FAO) and the World Organisation for Animal Health (OIE) have established the Progressive Control Pathway (PCP) as a mechanism to measure progress and guidance for FMD eradication from individual countries and regions. It encompasses a series of stages. Towards the end of the PCP process, countries begin to approach the international recognition by the OIE as FMD-free with vaccination and eventually free from FMD without vaccination. Regional approaches are considered essential for national success and for this reason FAO and its partners hold several annual regional meetings to engage countries in the elimination of FMD from targeted livestock sectors.

Introduction
Encouraged by the Global Declaration of Rinderpest Freedom in mid-2011, many have asked “what disease is next?”. The successful eradication of rinderpest was based on 3 “pillars” that are key for the eradication of any disease: (a) concerted political and financial will; (b) effective diagnostic tools and methods of prophylaxis (e.g. vaccines), and (c) a thorough understanding of the epidemiology of the disease. The discussion has led to the consideration that FMD should be the next disease for global eradication under the umbrella of the FAO/OIE Global Framework for the Progressive Control of Transboundary Animal Diseases.

Measuring FMD Against the 3 Key “Pillars” Necessary for Global Eradication of a Disease

Concerted Political and Financial Will
While effective global control and prevention of FMD remains of great concern to those countries that have a historical record as being free, or have invested considerable funding from the public and private sector to its elimination (i.e., North and Central America, Western Europe, Oceania and countries of the far East, and parts of South America, some countries in
Southern Africa), there is less interest in the concept of eradication in those countries where the disease is endemic. In contrast with rinderpest, FMD kills very few animals. This lack of interest is often due to competing priorities, poor veterinary infrastructure, or limited opportunity for international trade in animals and/or ruminant products. Yet, FMD should not be seen as only a ‘rich country’s’ concern, as it often has a major impact in endemic settings on efficient and healthy animal production. Its impact is particularly important for small family holdings, where FMD leads to mortality in young stock, poor feed conversion, diminished milk production, and inability to use animal traction for the preparation of fields for crop cultivation, irrigation and transport.

**Effective Diagnostic Tools and Methods of Prophylaxis**

Our molecular knowledge of the 7 different serotypes of FMD virus has grown exponentially in the past 20 years and there are now many sophisticated and sensitive diagnostic assays available for field and laboratory use and knowledge of the components for an effective vaccine. The global eradication of FMD could be achieved with the current tools. However, the ideal vaccine, one that provides rapid protection and confers long duration of immunity with wide cross protection against circulating viruses, has yet to be developed. That said, many countries have achieved eradication of FMD by targeted vaccination over a span of several years. FMD vaccines against all serotypes are produced by several pharmaceutical companies and are readily available on the international market. Of great relevance, however, is the need to have vaccines ‘match’ the circulating subtype or strain and this requires a strong link between vaccine selection and field epidemiological analysis.

**A Thorough Understanding of the Epidemiology of the Disease**

The epidemiology of FMD is reasonably well understood. It is far more complex than rinderpest.

FMD affects several animal species, induces a carrier state in domestic ruminants for several weeks to years, exhibits high antigenic variability, and in Africa has a known reservoir in African Cape buffalo, all of which make the prospects for elimination difficult, especially in endemically infected countries where other civil, social, health and economic issues are given greater priority.

International standards, as set up by the OIE, recognize two statuses: free or infected. In the former, there is a further distinction between free-with-vaccination and free-without-vaccination. FAO, through its European Commission for the Prevention and Control of Foot-and-Mouth Disease (EU-FMD) and the Emergency Prevention System for Animal Health (EMPRES), has developed a stepwise approach to guide countries and regions wishing to embark on improved management and progressive control of FMD. Such an approach will assist countries in developing capacities to address other
health concerns and build the necessary links between government,
professional associations, commercial interests and the private sector.

Some of the valuable lessons from rinderpest eradication were: (1) the
establishment of country-cluster networks working together and
harmonization of activities to face a common threat; (2) the recognition of a
reference laboratory at global level that would advise and provide services to
international and regional organizations and would assist countries in
developing the diagnostic capability to undertake surveillance needs; (3) a
global secretariat for coordination, consolidation and dissemination of country
and regional developments; (4) ensuring that voices from countries and
owners were heard and recognition of the importance of local knowledge.

Table 1 compares the biological features of relevance to the eradication of
rinderpest and foot-and-mouth disease.

<table>
<thead>
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<th>Biological Comparison between Rinderpest and Foot-and-Mouth Disease</th>
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<tbody>
<tr>
<td>Rinderpest</td>
</tr>
<tr>
<td>• One serotype</td>
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<tr>
<td>• No significant antigenic variance (four genotypes)</td>
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<tr>
<td>• Principally cattle and buffalo (wild ungulates as indicators of disease)</td>
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<tr>
<td>• Long lived immunity (natural or induced)</td>
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<td>• Highly labile to environmental factors</td>
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The Progressive Control Pathway for Countries to Achieve Freedom from Foot-and-mouth Disease
(see http://www.fao.org/ag/againfo/commissions/docs/PCP/PCP_en.pdf)

Historically, successes in the prevention and control of FMD (for example, Western Europe and South America) have relied heavily on the wide coverage of inactivated vaccines administered to select susceptible species, combined with animal movement restrictions, institution of surveillance zones, and in some notable cases the wide destruction of affected and ‘dangerous contacts’. Since the mid-1990’s, diagnostic assays have become available to assist efforts in determining virus circulation within a FMD-susceptible population based on the immune response against FMD virus non-structural proteins. These assays differentiate vaccinated animals from those where the virus has replicated.
Progressive Control Pathways (PCP) are a risk based approach whereby countries/areas or regions can embark on risk analysis and management of disease. In the specific case of FMD, the PCP is designed for countries to tackle the infection at source by identifying the disease dynamics in the country/area/region (production, social and marketing networks), as they relate to antigenic changes in the circulating viruses and the availability of suitable vaccines. The FMD PCP approach also allows veterinary services (public and private) and regulatory authorities to develop roadmaps identifying their need for technical and financial support.

The FMD PCP has 6 stages described in the FAO/OIE document (zero through 5 with stage 6 being implicit once the country has achieved freedom from disease without vaccination).
Implementing the Progressive Control Pathway

One of the approaches conducted by FAO and its partners, is to hold regional workshops where the countries themselves evaluate the prevalence, incidence and stage in which they find themselves. This self-evaluation (with inputs from neighbours, epidemiologists, laboratory personnel and disease managers) allows for activities to curb the incidence of FMD. Close participation and involvement of the private sector (production, marketing, pharmaceutical) is encouraged to offset the cost of control measures by the public sector. At the time of this writing, FAO, OIE and the World Bank are assessing the cost of the global eradication of FMD.

Conclusion

While the epidemiology of FMD is far more complex than rinderpest, the technological tools are available to support the global eradication of the disease from the livestock industry. Eradication requires investment in FMD control that needs to be shared between the private and public sectors. The eradication of rinderpest was achieved because the international community supported regional programs. Through the Progressive Control Pathway, FAO and OIE have provided a roadmap for countries and regions with FMD to eradicate the disease. Success will not come quickly, but it can be achieved.
REPORT OF THE COMMITTEE ON GOVERNMENT RELATIONS

Chair: David L. Meeker, VA

Richard E. Breitmeyer, CA; Stephen K. Crawford, NH; Mark Ernst, IL; Kristin Haas, VT; Steven L. Halstead, MI; William L. Hartmann, MN; Christine N. Hoang, IL; Guy Hohenhaus, MD; Bruce King, UT; David T. Marshall, NC; VA; Brian T. Smith, DC; Richard Wilkes, VA Marty Zaluski, MT

AAVLD Attendees: John Adaska, CA; Bruce Akey, NY; Tim Bazsler, WA; Craig Carter, KY; Thomas McKenna, WI.

Committee Chairs in Attendance: Mike Gilsdorf, DC; Gail Golab, IL; Christine N. Hoang, IL

American Veterinary Medical Association and Association of American Veterinary Medical Colleges

Dr. Mark Lutschaunig, Ms. Gina Luke, Dr. Ashley Shelton, Dr. Whitney Miller

Dr. Marguerite Pappaioanou, Mr. Brian Smith

The Committee meeting began with Dr. Mark Lutschaunig describing the AVMA’s Governmental Relations Division (GRD) staff externship program. He stated that during the last two years the GRD has been actively building relationships, creating continuity, attending and participating in hearings on veterinary medicine related issues including antimicrobials, horse slaughter and transportation, and veterinary workforce issues. Despite AVMA’s hard work, Dr. Lutschaunig said it may appear to some veterinarians that Washington moves too slowly and real progress is difficult to achieve. However, even with the congressional focus on cutting the federal budget and federal programs, Dr. Lutschaunig is hopeful that the federal budget will spare the Veterinary Medicine Loan Repayment Program and other key funding priorities for the AVMA. He is also optimistic that the Veterinary Medicine Loan Repayment Program Enhancement Act (VMLRPEA) and the Veterinary Services Investment Act (VSIA) will continue to make progress in both chambers of Congress.

Dr. Lutschaunig mentioned that are 13 freshman senators (12 Republicans, 1 Democrat) and 93 freshman representatives (84 Republicans, 9 Democrats). Last November’s election has dramatically changed the dynamics in Congress. Everyone is rethinking their approach, especially with the focus on significant budget cuts. Dr. Lutschaunig stated that animal health and welfare continue to be important issues especially as discussions begin on the next Farm Bill. He also mentioned he and his staff anticipate that legislation will likely be reintroduced on a wide array of issues including bills dealing with antimicrobial resistance, animal husbandry, dog breeders, veterinary college issues, small business, and equine slaughter.
There was some discussion on the dog breeding issue by the GRC members.

Gina Luke reviewed the provisions and status of VMLRPEA and VSIA for the 112th Congress. She explained what happened to these bills during the 111th Congress and the prospects for their movement this session. She also briefly discussed AVMA’s FY 2011 agriculture appropriations priorities and the impending budget battle in FY 2012. GRC asked about the VMLRP Shortage Situation Designations and about the loan repayment awards made in 2010. Gina quickly ran through the National Institute for Food and Agriculture’s (NIFA) awards, schedule and shortage designation process and identified the states whose shortage nominations were not designated. GRC thanked Gina for the data she provided which helped some states prepare their 2011 nominations for shortage situations to NIFA.

Dr. Marguerite Pappaioanou presented an update on AAVMC activities. She reported that there are 66 members of AAVMC that include 32 veterinary colleges in the US and Canada, 9 AVMA/COE accredited international veterinary medical colleges, 9 U.S. Departments of veterinary science, and 9 U.S. Departments of Comparative Medicine. AAVMC also has several affiliate members such as the veterinary faculty at the University of Copenhagen, and the veterinary schools at St. Matthew’s and St. George’s Universities. Dr Pappaioanou discussed the six strategic goals of AAVMC’s strategic plan which guide AAVMC’s activities (see the strategic plan at http://aavmc.org/About-AAVMC/Strategic-Plan.aspx). She also provided an update on the North American Veterinary Medical Education Consortium’s Draft Report and Recommendations, which addresses identifying Day 1 competencies of graduates to meet societal needs, and approaches to delivery of education). Federal veterinarians and other stakeholders of veterinary medical education are being asked to review the Draft Report and to provide feedback on the Draft Recommendations at www.NAVMEC.org/ through April 30th.

USDA-Agriculture Research Service
Dr. Caird Rexroad, Dr. Cyril Gay

The Committee met with Caird Rexroad, Associate Administrator and Cyril Gay, National Program Leader for Animal Health in ARS at the AVMA Office in Washington DC. These two gentlemen covered several topics amount them were:

1. The National Bio and Agro-Defense Facility (NBAF) which is a planned United States government-run research facility that will replace the 1950s-era Plum Island Animal Disease Center in New York, which is “nearing the end of its lifecycle and is too small to meet the nation’s research needs.” The NBAF will be operated under the authority of the United States Department of Homeland Security, with the USDA-ARS and Animal Plant Health Inspection Service, Veterinary Services (USDA-AHPHIS-VS) as primary research partners.
The facility, which is not yet built, will be located in Manhattan, Kansas. The 520,000-square-foot facility should be operational by 2018, and employ up to 300 people.

The new facility will research and develop countermeasures to combat “high-consequence biological threats involving human, zoonotic and foreign animal disease.” Included among the diseases to be studied at the research lab are: Foot-and-mouth disease, classical swine fever, African swine fever and contagious bovine pleuropneumonia. The facility will include Biosafety Level 3 and Biosafety Level 4 laboratories.

2. The Global Foot and Mouth Disease Research Alliance (GFRA) is a coordinated global alliance of scientists producing evidence and innovation that enables the progressive control and eradication of FMD. USDA-ARS is part of this alliance. GFRA have five strategic goals:
   - Facilitate research collaborations and serve as a communication gateway for the global FMD research community.
   - Conduct strategic research to better understand FMD.
   - Development of the next generation of control measures and strategies for their application.
   - Determine social and economic impacts of the new generation of improved FMD control.
   - Provide evidence to inform development of policies for safe trade of animals and animal products in FMD-endemic areas.

3. The United States now has a $50 billion trade surplus in agricultural products. People of the world have a lot of confidence in the agricultural products that come from the United States.

The meeting with USDA-ARS was very fruitful and interactive. Many thanks to both Caird and Cyril for their time and efforts.

National Veterinary Services Laboratory, National Animal Health Laboratory Network
Dr. Beth Lauther, NVSL
Dr. Sarah Tomlinson, NAHLN

- FMD exercises
  - 15 separate exercises in 2010 (one day exercises)
    - After action reports generated for each exercise (Finalized by end of March)
    - Overall report in the works (targeted for completion at end of April)
  - First internal NVSL exercises planned (2 one day exercises planned, one AI and one FMD). To identify gaps in internal NVSL emergency response procedures
    - First exercise on 3-9-11
    - Sara offered (upon request) to share format for internal NVSL exercise as template for individual labs to do their own internal exercises.
REPORT OF THE COMMITTEE

- Internal VS policy workshop planned to digest remaining policy gaps in FMD response after all the FMD exercises (particularly decisions related to laboratories (e.g. adequate reagents))

- NAHLN Portal
  - Based upon Food shield.
  - Purpose is to improve communication
  - 4 Modules. SOPs, lab director (space, personnel, equipment), proficiency test results, and training module)

- NAHLN capacity calculator
  - Working with capacity estimation software (Texas group)
  - Capacity estimator across NAHLN and within NAHLN labs
  - Goal is to provide an on line tool
  - Goal is real time estimate of laboratory testing capacity
  - Currently 6 labs enrolled to test capacity calculator

- Quality Management systems
  - NAHLN hosted Quality Assurance/Quality Control workshop August 2010 (at NVSL) to assist AAVLD and NAHLN labs implementing AAVLD ISO 17025 laboratory accreditation standards
  - National Plant Diagnostic Network partnering with NAHLN and AAVLD to accredit their laboratories under AAVLD ISO 17025 standards

- NAHLN IT system
  - 13 NAHLN labs sending CSF and AI test results electronically
  - Objective is to leverage IT capabilities with states based upon USAHA resolutions
  - NAHLN formed IT subcommittee to address findings from USDA Certification and Accreditation process (federal requirement)
  - NVSL secured off the shelf program to replace NAHLN IT system (generic database for NVSL, NAHLH, animal health surveillance and monitoring (lab submission).

Dr. Beth Lautner
- Resolution 21 (NAHLN structure) (Beth)
  - NAHLN coordinating council
    - Met in DC February 28-March 1 (2 facilitators)
    - Items discussed
    - NAHLN Functions and structures
    - Committee findings report to AAVLD/USAHA joint NAHLN committee
    - Discussed NAHLN models based on region, expertise, animal base, “just in time” (all labs activated as needed)
GOVERNMENT RELATIONS

- Necessity to conduct needs assessment for capacity for detection, response and recovery for FAD versus zoonotic versus program
- Will come out as pros and cons not USDA policy decision. Too early in the process
- Would not be put in place for 2012 budget
- Question about stakeholder input. Responsibility will be to the joint USAHA-AAVLD Committee on the NAHLN to get stakeholder input. Then that committee get info the coordinating council before concept paper would be written

- Repository for laboratory reference materials.
  - Need for the creation of one or more repositories for control sera/tissues, field isolates of organisms and possibly reagents that are critical to test development/validation, epidemiology, vaccine development/validation, analysis of genetic shift/drift in pathogens, etc (Beth)
    - NVSL supportive of concept (would work together with AAVLD group to continue). Make repository characterization standardized between agencies (CDC, ATCC etc.).
    - NVSL willing to coordinate a meeting for discussion of the issue
    - First step could be inventory at both NVSL and state labs
    - Current NVSL repositories
      - NAHMS serum bank is available (TB, brucella)
      - Johnes fecal and milk samples
      - Brucella and M. bovis
      - SIV repository
    - CDC, ATCC, FADDL
    - Mike McIntosh at FADDL part of national forensic repository

- Funding/Budget Perspectives & Challenges
  - 2011
    - No impact on APHIS for FY 2011
    - Travel restriction (retroactive)
  - 2012
    - Veterinary diagnostics (NVSL) had increased budget in president’s budget (NVSL and CVB)
    - Reduction in president’s budget to Johnes, CWD and aquaculture
• NVSL planning for budget reduction is primarily reduction in personnel (not filling some open positions)
• Eliminate two section heads at NVSL
• Scrapie genotyping moved to Mycobacterium/brucella section so holding that position open
• NVSL working to optimize customer service at reduced budget
  ▪ New budget structure
    • Some NAHLN funds moving to NVSL
    • NVSL NAHLN funds would be level
  ▪ Zoonotic disease line item in new budget structure

• Other Updates/Questions
  o Q.: Status of BSE surveillance program?
    ▪ Ongoing program goal 40,0000 samples
    ▪ Currently collect more OIE points than needed thus reviewing need for current number of annual samples
    ▪ For BSE laboratories, there is still a 6 month lead time for notification of changes in the BSE testing program
  o Q.: Transmissible diseases of poultry committee. “Would PCR pooling for AI be allowed?”
    ▪ No immediate answer. Beth will followup later
  o Q.: END in Mexico. NVSL collaboration with Mexico to get END viral strain so ensure current tests will detect that variant?
    ▪ NVSL received information about virus to check PCR tests. NVSL currently working with lab in Mexico.

Food and Drug Administration, Center for Veterinary Medicine
Dr. Bernadette Dunham, Dr. Renate Reimschussel
CVM's New Program – Vet-LRN (Veterinary Laboratory Response Network)
Handout provided of Powerpoint slideset. Renate Reimschuessel, VMD, PhD presented an overview of the Vet-LRN:
   Mission: promotion of human and animal health through collaboration with veterinary diagnostic laboratories to provide scientific information, build laboratory capacity, and train scientists. Implementation will create a network similar to the FERN (Food Emergency Response Network) System. The Vet-LRN will integrate existing labs and lab networks such as NAHLN, the CDC LRN system, and others within the Integrated Consortium of Laboratory Networks (ICLN) such as within the Department of Homeland Security, EPA, Interior, etc. The proposed Vet-LRN will involve 4 persons at
FDA-CVM: two in the Office of Research, one in the Office of Surveillance and Compliance, and one contractor. Further development dependant on funds.

Antimicrobial use: FDA CVM is reexamining use of antimicrobials for “growth promotion” and increasing feed efficiency. Originally, the FDA CVM plan was to drive reduction in use of antimicrobials in food producing species. This plan has been revised to now recognize that growth promotion and feed efficiency effects are due to therapeutic impacts of antimicrobials; subsequently, product labeling needs to be revised to state this fact through phasing out the growth promotion statements in favor of pathogen management (treatment) statements. This will allow use under veterinary oversight. Proposed wording will be available in late spring/early summer 2011.

Food Safety Modernization Act: Food and feed safety through “tag-teaming” collaboration within FDA and across to USDA FSIS and USDA APHIS and other sister agencies. The cornerstone of this effort will be to prevent, rather than focus on response. The act does provide recall and license suspension authority, expanded records access, third party certification provisions, and import ban options. Challenges that will need to be addressed at FDA are oversight capacity and appropriation limitations.

Animal Agriculture Coalition

Members of the Animal Agriculture Coalition joined the Committee, with nine representatives joining in person and by phone. AAC indicated their work on preparing an appropriations letter using a template for priorities for the coalition. The groups discussed the proposed budget for APHIS-VS, including the new line-item structure. Both groups agreed that while the flexibility can lead to advantages, industry input is important on those allocations. Some members would like to see more separation among species.

Concern was brought forth regarding reallocation of funds from avian influenza surveillance to animal care programs, which could be viewed as precedence of moving funds from priority programs to other agencies within APHIS.

The equine industry has become unified in looking at equine disease programs and establishing a presence within VS programs. While overall budgets are smaller, the equine groups still feel addressing issues such as equine piroplasmosis is important.

AAC members shared key issues within each of their industries. A common theme was the continued need for research and related funding to ensure technologies and practices can progress. Traceability was discussed, noting that the U.S. needs to continue to move ahead to maintain competitiveness internationally. There was also concern with the increased responsibility for industry and states in addressing diseases, particularly after the economy recovers.
AAC members were thanked for their participation in the meeting and in USAHA and AAVLD. The meeting was then adjourned for the day.

Wednesday, March 9

Center for Public and Corporate Veterinary Medicine
Dr. Valerie Ragan

Dr. Ragan met with the committee to discuss their new career resource center based at the Virginia-Maryland Regional College of Veterinary Medicine for students to explore veterinary medicine jobs outside of private practice. The CPCVM formalized partnerships with USAHA and AAVLD in the last year through a Memorandum of Understanding. Four students from Virginia attended the USAHA/AAVLD meeting in 2010 and have returned to campus as ambassadors, spreading the work to other students. Future plans include: Working on developing a mentor program to match students up with people in jobs they are interested in, developing a self-assessment for students and a career advisory board. They are making efforts to get students involved in exploring these options earlier in their career instead of waiting until the fourth year, including presentations to the annual SCAVMA meeting. Efforts will be made to recruit students from other veterinary schools as well. Both USAHA and AAVLD should include a veterinary student orientation at the annual meeting (work with USAHA/AAVLD to revise the existing meeting orientation to target students). Another suggestion is to use an AAVLD or USAHA member at each College or School of Veterinary Medicine as a point of contact to answer questions and reassure students about going to the meeting. Finally, AAVLD might explore having the AAVLD Foundation sponsor some travel awards for these students. We will need to grow the program slowly at first to avoid being overwhelmed.

For more information see:

USDA-APHIS-Animal Care (AC)
Dr. Chester Gipson

Dr. Gipson provided an overview of AC’s general issues and activities, including:

- working with vet schools on internal animal use issues, policies
- the changing landscape of animal welfare as the public becomes more engaged
- there have been efforts to link dog and cat bills with livestock
- education and outreach efforts - no longer want to be a 'hammer looking for a nail'
- could act as facilitator for livestock welfare issues in USDA, ex. foam based depopulation of poultry
GOVERNMENT RELATIONS

- ongoing regulation development - importation of pets, regulation of internet sales, TB in elephants
- budget is challenging
- recent AC meeting had only 20 states in attendance, AC funded travel and meeting expenses

Dr. Gipson gave an overview of the recent Office of Management and Budget audit. While the audit focused on bad, AC is being more active in enforcement.

Dr. Gipson next provided information on the Animal Welfare Center in Kansas City. The concept was conceived because no central site for animal welfare issues in federal government. About 3 years ago was first time animal welfare was added to USDA mission statement. The Center currently houses a director, 5 specialists and economists with the charge of seeking issues that need to be researched or addressed. The specialist areas include a primatologist, big cat specialist, marine mammal specialist, elephant specialist, biophysicist, and would like to also add a shelter medicine expert.

In regards to livestock, the Animal Welfare Act limits regulation of livestock to research and education settings, prohibits regulatory authority in production and exhibition settings. USDA-APHIS-AC works with 4-H and other show groups but has no regulatory authority. They do collaborate on evaluation planning for licensees.

USDA-National Institute for Food and Agriculture (NIFA)
Dr. Roger Beachy, Dr. Meryl Broussard, Dr. Muquarrab Qureshi, Dr. Gary Sherman, Dr. Mark Robinson, Dr. Margo Holland, Dr. Peter Johnson

Dr. Roger Beachy, Director, NIFA opened the session with a warm welcome and introduction.

Dr. Beachy made some brief comments about the new Institute for Food Production and Sustainability and other initiatives and also mentioned that NIFA is recruiting a veterinarian out of academia to provide leadership in this area. He also spoke of the importance of additional work on things like antibiotic residues and surveillance for agents such as E. coli O157 in food.

Dr. Beachy thanked the AAVLD and USAHA for contributions to food safety as it relates to laboratory testing services, the provision of expert consulting advice and policy-making.

Dr. Beachy then introduced Dr. Meryl Broussard who also welcomed the group. He then complimented the AAVLD and USAHA on doing such a good job of establishing and implementing the NAHLN. Overall, NIFA is pleased with the President’s budget.

Dr. Breitmeyer made the comment that state laboratory resources are the only resource for animal health at that level, citing the important role of the California laboratory system in outbreaks such as the previous Exotic Newcastle outbreak. Dr. McKenna described the CWD surveillance in
Wisconsin. Dr. Marshall explained the importance of keeping fees low to assure adequate surveillance, underscoring the need for better funding.

Dr. Carter thanked NIFA for special research grant support for Kentucky and the assistance provided by Mark Robinson and others. Over the last several years, these funds made the development of the Kentucky Animal Health Information System possible. Both Kentucky laboratories and the Office of the Kentucky State Veterinarian are now utilizing software systems which provide better situational awareness for animal health. Dr. Carter cited some recent success stories with the animal health monitoring applications that are part of the system including the early detection and alerting of significant increase in cases of blackleg, leptospirosis, cattle bloat and most recently, equine placentitis cases.

Dr. Baszler asked about NIFA’s future strategy for funding the NAHLN and expressed concern about the idea for competitive funding because of the unpredictable nature of veterinary laboratory workloads and needs (“disease du jour” concept).

Dr. Robinson commented that the recent meeting of the NAHLN Coordinating Council was very productive in his opinion and hopes that there will be more federal funding made available to sustain the network in support of food safety and animal health.

Dr. Peter Johnson, NIFA spoke of how NRI and other funding could be used in creative ways to improve funding of the NAHLN. He proposed coupling research projects with the NAHLN that could increase overall funding that could be used for instrumentation and other support.

A brief discussion of microarrays and other novel multi-agent testing technologies. Dr. Beachy asked if these are being utilized. Dr. McKenna stated that at this time microarrays are too expensive to be attractive for producers but feels the technology will evolve and become cheaper.

Dr. Beachy asked about the availability of epidemiology resources for the laboratories. Dr. Akey stated that laboratory data is under-utilized at this time. Dr. Carter explained that only about three laboratories in the country have any significant epidemiology staffing but that this seems to be growing. The integration of veterinary laboratory LIMS data bases is possible but would require a lot of planning and work to come to fruition. The Kentucky network has been under development for 4 years and is still not fully evolved. Dr. Robinson commented on the great potential for regional and a national network of laboratory data bases.

Dr. Elvinger asked if surveillance projects are eligible for funding. A NIFA staff member responded that they would be eligible for the current budget cycle.

The topic of NIFA training fellowships was then discussed. NIFA is currently evaluating applications. Dr. Beachy stated that funding of the fellowships is a high priority. He would like to see more veterinarians apply, especially those working on PhDs. The research projects under the program can be broadly defined.
Dr. Beachy then went over the proposed NIFA budget for fy 2012. He explained that the NAHLN funding is rolled into the Food and Agriculture Defense Initiative funding line.

**Department of Homeland Security**

Dr. Doug Meckes, Dr. Larry Barrett

The group met with Dr. Doug Meckes from the Food, Agriculture and Defense Division of the Office of Health Affairs, Department of Homeland Security (DHS). Dr. Meckes had with him a guest, Dr. Larry Barrett, director of the Foreign Animal Disease Diagnostic Laboratory (FADDL) at Plum Island.

Dr. Meckes conveyed that the general concern was that the fiscal crisis had not peaked and would come to a boiling point in the next 2 years. His concern is that recent appropriations of real dollars to agriculture have been flat, resulting in a net decline in investment of actual dollars.

The DHS is finishing up a white paper on the Korean Foot and Mouth disease (FMD) situation, and he shared some statistics from that ongoing event (81,000 people involved in response, 13 M animals, 21 decontamination sites, 4,400 burial sites, 3.2 M animals destroyed). The general opinion is that they did not start vaccinating quickly enough, and that the disease got into the amplifying swine population early. The burial policy is generally perceived as a public relations mistake. We can also expect a draft Situation Report on the Japanese FMD incident shortly, a country who reached out to DHS for advice.

Dr. Meckes then reviewed the involvement of DHS in agricultural issues, including the Science and Technology section, agrodefense, NBAF, training and education in the agriculture and food sector through FEMA, and development of target capabilities lists. He noted that of the 37 target capabilities, 26 of them received less funding combined than #1 (communications), and that less than 1% is directed at food and agriculture. DHS funding is passed through the state Emergency Management or homeland security structure, with no means for direct allocation from DHS to specific sectors at the state level.

Dr. Meckes commented that Customs and Border Protection (CBP) is not where they want it to be, but is aware of and focused on the international FMD situation. They issued “mustered” the inspection force regarding FMD in response to industry concerns.

Dr. Larry Barrett from FADDL then gave an overview of the Plum Island/NBAF situation. He praised the operational model of joint USDA/DHS oversight of the facility, stating that operational expenses were eroding science investment in other high containment laboratories, but not at Plum ($36M operational budget, $12M science and research budget). He stated that the DHS has put $86M of investment into the Plum facility in the last 5 years, as the earliest expected validation date for the NBAF would be 2018, with an approximately 2 year window for moving into the facility after that.
Dr. Barrett then provided the group an update on the development of the experimental recombinant FMD vaccine, which is showing great promise (98% efficacy in challenge trials, with a safety study to be conducted in 600 cattle early this year.) The goal is to have conditional licensure by the end of the calendar year. Dr. Barrett also mentioned that they supplied 2.5M doses of conventional “Type O” vaccine to Korea.

**USDA-APHIS**
**Ms. Cindy Smith, Dr. Gregory Parham**

The Committee met with APHIS Administrator Smith and Associate Administrator Parham. The group discussed top-level issues, including NAHLN funding, changes within VS from the Secretary’s level, expectations for agriculture appropriations and budgets and traceability. Administrator Smith welcomed the comments and thanked the committee for input and the work done to support APHIS.

**USDA-APHIS-Veterinary Services**
**Dr. John Clifford, Dr. Jere Dick, Dr. T.J. Myers, Mr. John Picanso**

Dr. Clifford led discussion about the 2012 budget for Veterinary Services. Veterinary Services budget is being submitted by species line items rather than by disease programs as was done in the past. Currently there is no line item funding for the equine industry in the budget for diseases such as Piroplasmosis and Contagious Equine Metritis. Because of the budget reductions expected in the 2012 budget Veterinary Services will probably have to reduce the number of attendees at the USAHA annual meeting. VS plans to be increasing their role in on-farm food safety efforts in the area of outreach. There will be reduced funding for Avian Influenza surveillance. To accommodate this it will be necessary to adjust the testing protocol. A general discussion followed about the challenges faced by the expansion of backyard poultry facilities.

Mr. John Picanso provided an overview of the new software platform for states. The CoreOne system will be replacing the generic database. VS will begin implementation at the state and laboratory level, with 10 states receiving on-site installations. The goal is to be operational by winter 2012.

Dr. Jere Dick reported on a Vision 2015 pilot project of the One Health initiative. It is the implementation of a One Health coordinating office for one year. The purpose of the coordinating office is to develop a vision, mission and operating plan to coordinate one health efforts. Joe Annelli will report to Dr. Dick. Dr. Annelli will be working on the project full time and Jerry will spend 25% of his time on the project. Additionally there will be four part time employees involved in the project. They will be coordinating efforts with CDC and FDA. There will be 3 areas of focus; developing a communications plan, a training and education plan and an operational plan.

The Committee reviewed some of the key resolutions and committee issues with VS staff, including the Select Agent List. A proposed rule on this is anticipated in late 2011.
GOVERNMENT RELATIONS

The Committee discussed traceability with Dr. Clifford and staff, including the concept of a control board as a means to provide review for levels of compliance as outlined in the traceability framework. The concept would need more development, and USAHA was encouraged to include as part of the rule commenting once published.
REPORT OF THE COMMITTEE ON IMPORT-EXPORT

Chair: Charles E. Brown II, WI
Vice Chairs: Mark Engle, TN
George Winegar, MI

Bobby Acord, NC; Bob Bokma, MD; John Braly, CO; Gary Brickler, CA; Stan Brunzt, CO; Suzanne Burnham, TX; Sarah Chalangaran, CA; Ignacio dela Cruz, MNP; Linda Detwiler, NJ; Effingham Embree, Jr., IL; Mark Engle, TN; J Amelita Facchiano, TX; William Fales, MO; Julie Gard, AL; Chester Gipson, MD; Cathleen Hanlon, NY; Robert Hilsenroth, FL; Donald Hoenig, ME; Floyd Horn, MD; Dudley Hoskins, DC; Laurie Hueneke, DC; Bruce King, UT; Ralph Knowles, FL; Elizabeth Lautner, IA; Amy Mann, DC; Richard Mitchell, CT; Elizabeth Parker, DC; James Pearson, IA; William Pittenger, MO; Paul Rodgers, WV; A. David Scarfe, IL; Shawn Schafer, ND; Susan Tellez, TX; Lee Ann Thomas, MD; Peter Timoney, KY; Paul Ugstad, NC; Charles Vail, CO; Arnaldo Vaquer, VA; Mark Walter, PA; James Watson, MS; Patrick Webb, IA; Roger Weigle, WI; Annette Whiteford, CA; Brad Williams, TX; William Wilson, KS; David Winters, TX; Richard Winters, Jr., TX; Cindy Wolf, MN.

The Committee met on Oct. 2, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 12:30-5:30 p.m. There were 35 people present, 13 members and 22 guests. Charles Brown was unable to attend. George Winegar chaired the meeting. Mark Engle served as Vice Chair.

The Use of MIM Application in Minnesota for Cattle Exports
Susan L. McClanahan, MN Board of Animal Health

Dr. McClanahan detailed the value of using radio frequency identification (RFID) and the Tuberculosis Mobile Information Management system (MIM) for TB surveillance to establish a negative bovine TB status and effectively represent that status to the nation. The complete text of this presentation is included at the end of this report.

Process for Approving Ports of Embarkation/Export Inspection Facilities
Paul Ugstad, Associate Director East Region, APHIS, VS

Dr. Ugstad discussed a process improvement initiative for Ports of Embarkation. Report pending.

Activities of APHIS’ National Center for Import and Export (NCIE) for FY2011
Bob Bokma, Export products NCIE
Joyce Bowling, Export animals NCIE
Dawn Hunter, Import products and By-products NCIE

Drs. Bokma, Bowling-Heyward, and Hunter reviewed NCIE activities regarding export of products and animals and import of products and by-
products. An outline of their presentations is included at the end of this report.

**CFIA – Report on Import/Export Activity in Canada and Changes in Regulations Affecting Livestock Movement from the U.S.**
Ann Allain, Senior Veterinary Officer, Terrestrial Animal Health Division, CFIA

Dr. Allain reviewed import requirements for CFIA to import live animals into Canada. Issues with brucella testing for swine were addressed. An outline of her presentation is included at the end of this report.

**Summary – Communicating Across Species: Preparing For an FMD Outbreak**
Presented by the FMD Cross-Species Communications Team
Prepared by: Cindy Cunningham, Assistant Vice President, Communications, National Pork Board

Ms. Cunningham discussed the developing message regarding the supply of pork, milk and beef in the event of an FMD outbreak. An outline of her presentation is included at the end of this report.

**Export of Poultry Meat, Pork Products and Other Commodities from Mexico, Central America and the Carribean into the U.S.**
Arnoldo Vaquer

Dr. Vaquer expressed the need to update veterinary programs, diagnostics, and disease surveillance in Mexico, Central America, and the Dominican Republic to meet international standards. The complete text of this presentation is included at the end of this report.

**Committee Business**

The Committee received a resolution from the Joint Committee on Animal Emergency Management. The resolution is entitled Electronic Certificates of Veterinary Inspection for Canada/USA Livestock Movement. The resolution states: *The United States Animal Health Association urges USDA APHIS VS and the Canadian Food Inspection Agency to collaborate in designing their Information Technology Systems so they are compatible in order to implement electronic certification to expedite movement of livestock across the United States-Canada border.*

The Committee took a vote to support the resolution promoting electronic certification of animal movements between the U.S. and Canada. The membership voted unanimously to support the resolution.
In July 2005, Minnesota identified the first bovine tuberculosis (TB) infected herd in the state since 1971. By 2009, a total of 12 cattle herds were found infected with TB. All herds were from two counties in northwest Minnesota and were subsequently depopulated. The state’s TB status was downgraded to modified-accredited-advanced (MAA) in January 2006 and then to modified-accredited (MA) in April 2008. After completing a statewide surveillance effort of over 1,500 herds in December 2007 and a TB review, Minnesota was granted split state status on Oct. 10, 2008. In October 2010 Minnesota received an upgrade in status to TB-accredited-free with the exception of the MA zone, which was upgraded to MAA status. In May of 2011, the Minnesota BAH submitted an application for statewide bovine TB-Free status to the USDA.

Since 2005, over 700,000 cattle have been TB tested in Minnesota. To improve the accuracy of ear tag data recorded during the TB testing and movement of cattle, the Board of Animal Health (BAH) implemented the use of Radio Frequency Identification (RFID) technology along with the Tuberculosis Mobile Information Management (TB MIM) application system in 2008. Developed in Michigan by Nate Plumm, who’s now employed by the USDA, the TB MIM has greatly improved the accuracy and traceability of ear tag data from cattle TB tested in the MAA zone. This system allows veterinarians that are TB testing livestock to capture livestock identification information into a hand held Computer (PDA) at the chute. Once the data is entered into the PDA, it can then be transferred into Excel spreadsheets or TB test charts. The data is also uploaded to the BAH database where it is used to record test results, generate TB test charts, record herd inventories and trace livestock movement. The MIM application along with the RFID tags enable BAH staff and private practitioners to effectively test more livestock in a shorter amount of time, with increased accuracy and less cost. Thus far, the BAH has used the MIM system to identify and test over 80,000 animals in the MAA zone. In addition, two veterinary clinics in the MAA zone are actively using the TB MIM application with ease.

In October of 2010, the BAH explored the idea of offering the MIM application to private practitioners, producers, and exporters who are involved with extensive TB testing of cattle in Minnesota. Since January of 2011, over 10,000 dairy heifers destined for export were TB tested by private veterinary practitioners using the MIM application. Ear tag data captured during TB and blood testing is electronically uploaded into the BAH database, and emailed to the involved testing lab from the veterinary clinics. Currently, five veterinary practices are using the MIM application in Minnesota under the support and guidance of the BAH. Ear tag data quality control measures remain a component of the application as well. Feedback from the veterinary clinics has been excellent and proven to be very cost effective.
IMPORT-EXPORT

effective while markedly improving the traceability of cattle in Minnesota. The application has been used extensively in Michigan for its TB eradication program and now in Ohio for the export of cattle.

The TB MIM application has proven to be of great benefit to producers and exporters. The application has multiple functionalities allowing the capture of accurate data related to the health status of the cattle. Since the ear tag and health data is captured chute side, processing crews and/or vet techs are able to efficiently record all pertinent data. “Alerts” may also be created on the PDA allowing easy identification of non-selected cattle when RFID tags are wanded. The cattle can then be sorted out at the end of the isolation period before shipment to the port. Downloaded into excel spreadsheets, the exporter is now able to evaluate health trends, design intervention strategies (such as the reduction in the number of non-selected cattle), and produce performance reports related to the source of the cattle. In addition, 2nd sequential USDA metal ear tags (valued at $.25/tag) are no longer necessary for blood testing and may reduce the risk of BLV transmission among cattle. The MIM application provides the producer and exporter with an ACCURATE inventory and health status of the animals on the premises.

This MIM project continues to expand in Minnesota as the BAH, veterinary clinics, producers, and exporters see the benefits associated with this application. More information on the MIM application and the required equipment can be found at http://tinyurl.com/TB-MIM. We encourage all stakeholders interested in MIM application to contact either Dr. Susan McClanahan or Ray Scheierl at the Minnesota Board of Animal Health.
Figure 1. One suggested strategy for capture of ear tag and health data while cattle are in pre-export isolation.
APHIS approves ports of embarkation (POE) and associated export inspection facilities (EIF) as part of its efforts to help animal industries and producers export animals. Approving ports and facilities is part of a larger effort to ensure that exported animals meet the importing country’s requirements, are generally healthy, and are fit to travel before they embark.

Over the last five years, the U.S. has seen dramatic increases in exports of animals especially in cattle (12,000 in 2006 to over 48,000 in 2011). Concurrent with increases in animal exports is an increase in requests for approval of temporary EIFs (from 37 during 2006-2010, to 24 in 2011 alone).

Exporters note the difficulty in locating EIFs at the POE because of the lack of space or the expense of the space. APHIS has been concerned about the health and welfare of animals when the EIF and POE are increasingly further apart. While a review of the scientific literature does not support a specific distance, it does suggest that closer is better. In light of the increases in exports and the increased requests for EIFs and POEs, APHIS plans to expand the official, acceptable reasons for requesting for newly or specially designated POEs and EIFs, clarify the requirements, and provide better guidance to exporters and staff.

Specifically, the changes will include:

1. Revisions to the regulations to expand the number of acceptable reasons for exporters to request a newly designated or specially designated port of embarkation or export inspection facility.
2. Regulations that are written with the required outcomes clearly defined and less specification about how to achieve those outcomes.
3. A requirement for exporters to develop a written contingency plan should the animals be compromised when moving them from the EIF to the POE that are further than 2 hours apart.
4. Clearer guidance for exporters and staff including clarity about the expectation for the distance between EIFs and POEs.
Export Animal Products Area

Veterinary Services has now fully implemented the use of security paper for the export of animal products. VS also now uses fillable certificates (VS 16-4, 16-4A), including the general “Export Certificate for Animal Products” and a number of letterhead certificates specific for certain commodities and countries. These new forms and procedures do not apply for certificates covering exports of veterinary biologics or of live animals or genetics.

VS has now fully taken over the certification for export to Mexico of the following animal products: dairy products for human consumption, animal feeds, and hides. Many certificates for these commodities were previously issued by APHIS Plant Protection and Quarantine officers located near border ports and commodity brokers. Export product certificates are issued now exclusively by veterinary medical officers, at a VS Area or field office.

New inspection packages have now been implemented for use in qualifying production facilities for animal products intended for export to the European Union. Revised regulations (242/2011) replace the EU 1774 rules have now been implemented by the EU. These require prior inspection and approval for an increased number of commodities. All certificates issued by Veterinary Services must be from inspected and approved production facilities.

National Center for Import and Export (NCIE) export staff officers continue working to eliminate bans and restrictions due to BSE and low-pathogenic notifiable avian influenza.

Some 103,986 export certificates were issued by APHIS for animal products during Fiscal Year 2011 (through Sept. 20, 2011). Among commodities certified were dairy products (39.1%), hides and skins (14.2%), animal feeds not including pet foods (12.3%), pet foods (10.4%), blood products (7.7%), and meat and bone meals (3.4%). These data also include certificates for pharmaceutical and biological products (2.7%).

OIE

The NCIE also continued in its work interacting with the World Animal Health Organization (OIE). More detailed information is being presented by Dr. Michael David in the meeting of the Committee on International Standards (Monday, October 3). A few highlights emphasize recognition of country and regions for animal disease and the work on changes to the Terrestrial Animal Health Code that impact the United States.

There are a number of changes in disease status [FMD, rinderpest, contagious bovine pleuropneumonia (CBPP), and/or BSE status]. Regarding countries and zones where FMD vaccination is practiced, certain zones in Brazil, Argentina, Bolivia, Paraguay, Colombia and Turkey were recognized as free with vaccination. In regions where FMD vaccination is not practiced,
certain zones were recognized as free of FMD in Argentina, Botswana, Brazil, Colombia, Malaysia, Moldova, Namibia, Peru, and the Philippines. FMD freedom was suspended in the Thrace region of Turkey, and Bulgaria, South Africa and Korea. Regarding CBPP, the People’s Republic of China was recognized. Regarding BSE, two countries, Panama and Denmark, were upgraded in status from controlled to negligible risk.

The OIE expects to take on the task of developing the criteria and questionnaires that would grant official recognition for African horse sickness (AHS), Classical Swine Fever (CSF), and Newcastle disease.

A remarkable highlight was that the OIE in the General Session declared that the world achieved “freedom from Rinderpest in its natural setting,” and that it will “undertake to reduce the number of institutions holding virus-containing material.”

Regarding the OIE’s Terrestrial Animal Health Code, there were some significant changes acted on at the OIE’s May 2011 General Session. These included a modification of definition of the term “wildlife” in the Code as “feral animals, captive animals and wild animals.”

The chapter (Chapter 15.2) on CSF was affected by the change in definition of wildlife noted previously. The OIE withdrew the CSF chapter as a result of discussion, and it will be presented again for consideration at the May 2012 General Session.

Based on comments regarding vesicular stomatitis (Chapter 8.15) provided by the United States, a list of safe commodities that can be traded regardless of the vesicular stomatitis status of a country was added and adopted by the General Assembly.

Regarding Newcastle disease (Chapter 10.13), again based on comments and support by the United States, the OIE adjusted the time/temperature parameters recommended for inactivating Newcastle disease virus in poultry meat.

An updated chapter (Chapter 12.9) on equine viral arteritis was adopted by the General Session. The United States has requested that the necessity for testing young colts (those between 6 and 9 months old) be reconsidered given that they are not likely to be bred, and that they will be repeatedly vaccinated throughout their lives.

The OIE is proceeding with a revision of the criteria that will determine which diseases to list; no new diseases will be added to the list until such criteria are first proposed and then presented for adoption. The diseases listed by the OIE likely will change as new criteria adopted. Thereafter some listed diseases could be delisted and other diseases could be listed.

A proposed new chapter on “Animal Welfare and Broiler Chicken Production” was not adopted. The U.S. urged that any final chapter be science-based and outcome focused. The revised Chapter is expected to be resubmitted for adoption in May 2012.
APHIS VS NCIE LIVE ANIMALS

The NCIE Import-Export Animals Staff has focused on plans to revise and streamline regulations, update import and export protocols where they are outdated, and standardize procedures for import and export of live animals. An additional priority is to maximize our use of technology for issuance of documents, by improving on the systems that are already available. Staff is also focused on making improvements to our website to make information more readily accessible and transparent to the public.

Animal Export

NCIE develops export protocols, participates in negotiations, and provides technical expertise in developing, retaining, and expanding export markets for U.S.-origin animals and germplasm. Most notable, cattle exports have increased tremendously to Russia, Turkey, Canada and Mexico. Exports of U.S. origin breeding cattle to Turkey increased from $7 million in 2009 to $76 million in 2010 and to a record $110 million for the first half of 2011, with possibility of reaching $200 million by the end of the year.

In FY 2011, NCIE:

- Opened 41 new markets in 27 countries, including cattle to Serbia and Vietnam; swine, sheep and goats to Jamaica and China; falcons to EU; and horses to Nicaragua, Argentina, and Jamaica.
- Negotiated retention of 29 markets in 18 countries (trade never stopped but the importing country threatened to shut down market).
- Expanded 43 markets in 26 countries (removed requirements or simplified certifications that would allow more animals to be exported).
- Sent 25 proposals to 14 countries for negotiation.

NCIE animal export staff are also responsible for requesting and negotiating exceptions to normal trade circumstances for shipments that need special consideration, or for shipments that have been detained at a foreign port, and for reviewing and harmonizing testing that is required for exported animals.

In addition to negotiating export protocols, NCIE facilitated international trade by serving as a technical liaison, providing technical support for visits (for audits or training) from foreign veterinarians, participating on international committees, attending meetings/conference calls, preparing letters/reports/briefings for senior level leaders, responding to notices (issued by foreign countries) to the World Trade Organization and responding to the impact of U.S. animal disease outbreaks on exports. NCIE negotiates the release of detained shipments and receives derogations from foreign requirements for trade in animals. NCIE staff officers provided support to VS field staff, VS Regional and Area Offices, the U.S. animal export industry, and the public by providing direction and responding to questions. NCIE staffs also provide interpretation of the foreign animal import requirements as well as develop associated policies to facilitate trade. NCIE handles dozens of queries each month about companion animals (including efforts to release
pets detained at the entry points in foreign countries) as well as negotiating new protocols for exporting pets to foreign countries.

In FY 2011, NCIE staff provided 2 separate export certification courses for veterinary medical officers (VMOs) and export document examiners. NCIE staff presented at training courses on aquaculture for VMOs. Additional training was provided to VMOs inspecting facilities for export of embryos and semen to the EU.

Three regulation changes were completed in 2011 affecting export:
1. The list of ports of embarkation was removed from the CFR and placed on the APHIS website at http://www.aphis.usda.gov/regulations/vs/iregs/animals/downloads/pt_e.pdf
2. Mandatory TB and brucellosis testing was removed for goats exported to countries that do not require this testing.
3. Mandatory export testing requirements were removed for exported swine.

NCIE continued working on fillable PDF versions of export forms. VS Form 7001 is complete, and VS forms 17-41 and 17-37 are under construction. NCIE continues work to make it easier to access information on our website.

NCIE organized several visits for foreign delegations that came to the U.S. to audit our live animal export procedures.
- Mexico came to evaluate our BSE control measures for cattle,
- Australia came to evaluate our export inspection procedures for horses,
- Jamaica came to evaluate our control measures for goats
- China came to evaluate our control measures for export of bovine embryos and semen
- Thailand came to evaluate our control measures for poultry, as well as bovine and swine semen

Other foreign visitors were part of technical exchange programs and NCIE staff provided presentations on the roles and responsibilities of APHIS, explained our veterinary infrastructure and described U.S. systems of animal disease control. These training activities build more personal international relations and help build foreign veterinary capacity both of which indirectly facilitate the flow of international trade in animals and animal products.

NCIE has started working with a contractor on a pilot electronic certification project. System should be ready for testing in 2012. It is an extension of the Phytosanitary Certificate Issuance and Tracking System used by APHIS, Plant Protection and Quarantine.

**Animal Import**

NCIE is responsible for negotiating import protocols, notifying field of import requirements, and setting standards to be followed at animal import centers and land border ports. In addition, many of the import and transit permits for live animals are issued by NCIE. Training is provided to the field
on proper import quarantine procedures. NCIE coordinates with laboratory people to ensure that import tests are the most effective. Changes to import requirements are communicated to trading partners, World Trade Organization (WTO), and the public.

NCIE issued over 1,600 import permits for regulated animals and commodities. In addition, complicated import and transit requests for live animals are coordinated with the field to ensure that animals are properly monitored while in transit, or en route to an animal import center.

NCIE import animals staff monitors world animal disease status, and coordinates any response involving appropriate import requirements and/or restrictions. Import alerts are sent to notify field personnel about changes in disease status and/or import requirements. NCIE also responds to numerous questions and requests for information from the public.

NCIE animal import staff is working to reorganize information on our website to make it more user friendly. In addition as domestic programs are updated (especially TB and brucellosis), import regulations will be reorganized and simplified to make import requirements more transparent. This process will continue into FY 2012.

NCIE staff participated in a training course for Mexican border port inspectors. In addition, a number of VS Memoranda were revised to standardize procedures at animal import centers. This included updates to import requirements for Mexican cattle due to changes in TB status of various regions. APHIS sent a team to the European Union (EU) to evaluate procedures within the EU to determine compliance with U.S. import requirements.

NCIE is working with a contractor on a pilot project within the E-Permits system to allow live animal importers to submit their application online for an import permit. This system should also be ready for testing in 2012. This will decrease work for permit examiners and facilitate the flow of information between importers and NCIE.

A pilot project using electronic certificates for Mexican cattle for import was deemed a success; however the system is not yet ready to be implemented on a large scale. NCIE will be able to use the information gained from this pilot to improve communication between countries when we move toward accepting electronic certification for import.

**APHIS-VS-NCIE Import Products/By-products**

- **Bovine Spongiform Encephalopathy (BSE) Comprehensive Rule**

  The BSE Comprehensive Rule will establish BSE-related import provisions which are more closely aligned with OIE guidelines including country risk status classifications (negligible, controlled, and undetermined). It will also allow flexibility in the BSE risk classification process allowing APHIS to concur with OIE BSE determinations. However, this will not eliminate independent APHIS evaluation of any country or region for BSE status. A country will be considered undetermined risk until such time that
APHIS determines it to be Negligible or Controlled Risk. Countries unevaluated by APHIS will remain in the undetermined risk category. Recognition will be based on the following criteria:

(1) APHIS concurrence with OIE classification, or
(2) APHIS evaluation, upon request, of countries not classified by the OIE.

The BSE Comprehensive Rule will eliminate the need for formal rulemaking for each individual country/region. The importation of bovines and bovine products from BSE minimal-risk regions (Canada) and for boneless beef from Japan (Kobe beef) would be removed from the Federal Register and incorporated into the rule. It would instead allow the importation of additional bovine and bovine products into the United States from all negligible and controlled risk regions using requirements based on OIE guidelines.

- Milk/milk products
- Semen and in-vivo derived embryos
- Hides/skins and gelatin/collagen from hides/skins
- Deboned meat [excluding mechanically separated meat (MSM)] from cattle ≤30 months of age provided the animals pass ante- and post-mortem inspection, specified risk materials (SRM) are removed, and they were not subjected to an air injected stunning process or pithing
- Protein-free tallow and derivatives made from this tallow
- Dicalcium phosphate with no trace of protein or fat
- Blood/blood by-products derived from cattle not subjected to an air injected stunning process or pithing, and collected in a manner that avoids contamination
- Ruminant meat-and-bone meal (MBM) and greaves from controlled and undetermined risk countries will remain as prohibited materials.
<table>
<thead>
<tr>
<th>OIE Code</th>
<th>APHIS’ Proposed Rule</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSE standards apply to “cattle.”</td>
<td>Proposed rule applies to “bovines” (includes cattle and bison).</td>
<td>Bison are important to trade in North America. Published information indicates that, along with other bovines, bison are susceptible to BSE.</td>
</tr>
<tr>
<td>Recommends allowing trade in live cattle from countries of undetermined risk, provided they were born at least 2 years after the date of effective enforcement of a ruminant-to-ruminant feed ban in the exporting country.</td>
<td>Will not allow the importation of live bovines from regions of BSE undetermined risk.</td>
<td>While a contributing mitigating measure, a feed ban is not the sole determinant of BSE risk. APHIS does not have enough information regarding countries of undetermined risk to confidently assess the risk of importing live bovines from such countries.</td>
</tr>
</tbody>
</table>
| Any age: Tonsils and distal ileum  
Over 12 months: tonsils, distal ileum, brains, eyes, spinal cord, skull, and vertebral column  
Over 30 months: tonsils, distal ileum, brains, eyes, spinal cord, skull, and vertebral column | Any Age: tonsils and distal ileum  
30 months or older: tonsils, distal ileum, brain, skull, eyes, trigeminal ganglia, spinal cord, vertebral column (except the vertebrae of the tail, transverse processes of the thoracic and lumbar vertebrae, and the wings of the sacrum), and the dorsal root ganglia | APHIS’ definition of SRMs is consistent with FSIS. While the vertebral column has not demonstrated BSE infectivity it contains the dorsal root ganglia (DRG) and spinal cord, which have demonstrated infectivity. The transverse processes of the thoracic and lumbar vertebrae, the vertebrae of the tail, and the wings of the sacrum do not contain spinal cord or DRG. |
| Many of the guidelines prohibit feeding ruminant based meat-and-bone meal (MBM) | Broadens these prohibitions to include other processed animal protein. | APHIS’ expansion of the prohibitions is to guard against feeding other processed animal |
and greaves to other ruminants. | proteins that could be contaminated by SRMs.

| OIE does provide dates for when a region has implemented an effectively enforced ruminant-to-ruminant feed ban. | APHIS will evaluate negligible or controlled risk regions to determine a date of effective enforcement of the ruminant-to-ruminant feed ban if that region requests to export live cattle to the United States. | This applies only to live animals which present a greater risk for introduction of BSE as opposed to products from which SRMs are removed at slaughter. A site visit will be required. |

- Transmissible Spongiform Encephalopathies (TSE) Rule: OIE Code does not address BSE risk for ovines/caprines. Therefore, a separate rule and risk assessment currently under revision that will address import requirements for TSEs and allow importation of sheep and goats, their embryos, and their products/by products from countries classified as Negligible or Controlled Risk for BSE under certain conditions.

- Newcastle Disease/Highly Pathogenic Avian Influenza (END/HPAI) Interim Rule: The END/HPAI Interim Rule is a revision of USDA policy regarding the importation of bird and poultry products from regions where END and HPAI are considered to exist. Previous USDA HPAI restrictions focused only on the H5N1 subtype. The Interim Rule applies to all HPAI subtypes. Changes include the addition of a specific cooking requirement (74°C internal temperature) to mitigate END and HPAI and a provision allowing exporting countries to certify that they have employed this mitigation as part of the export process. The END/HPAI Final Rule is currently under revision.

- Regionalization: Brazil: Final rule recognizing the State of Santa Catarina as free of FMD, rinderpest, Classical Swine Fever (CSF), African Swine Fever (ASF), and Swine Vesicular Disease (SVD). Published 11/16/10
  APHIS Defined EU CSF Region: Proposed rule to recognize the addition of Estonia, Hungary, Slovakia and Slovenia to the APHIS defined EU CSF regions. (Includes removal of restrictions on the importation of swine semen from the EU.) Published 2/11/11
  Uruguay: Proposed rule to establish conditions for the importation of lamb and sheep meat from Uruguay. Published 2/24/11
Switzerland and Liechtenstein: Proposed rule to recognize Switzerland and Liechtenstein as low-risk for CSF and Liechtenstein as FMD/SVD free. Published 5/19/11.
END and HPAI in EU Member States: Proposed rule to recognize as low risk for END and HPAI. Published 7/19/11.

- **VS 2015**
  Under the heading of VS 2015, an important Animal Products initiative is to streamline the animal products import regulations in Title 9 of the Code of Federal Regulations. This initiative will be done in stages, starting with Part 94, proceeding to Part 95, followed by Part 96. We have begun to lay out the changes needed for part 94. Our current thinking about the revision is as follows:
  - Reorganize and clarify the language in this part to make it easier to understand.
  - Make disease mitigation requirements less prescriptive and more performance based. Add a notice-based process and risk-based criteria for acceptance of new disease mitigation procedures.
  - Make miscellaneous updates and corrections identified during regulation review.
The Terrestrial Animal Health Division (TAHD) of the CFIA is divided into the following sections, under the direction of Dr. Francine Lord, Deputy Chief Veterinary Officer (CVO) for Canada and Director TAHD.
2. Foreign Animal Disease and Emergency Management
3. Epidemiology and Surveillance
4. Import Export
5. Canadian Center for Veterinary Biologics
6. Pet Food

The published vision of the Canadian Food Inspection Agency (CFIA) is, “To excel as a science-based regulator, trusted and respected by Canadians and the international community.” The CFIA mission statement is that CFIA is, “Dedicated to safeguarding food, animals and plants, which enhances the health and well-being of Canada’s people, environment and economy.”

Import/Export Section Responsibilities

The basis of safe international trade in Animals, Animal Products (AP), Animal By-products (ABP), is the zoosanitary certificate. The CFIA health certificate is a legal Canadian document which confirms that the sanitary requirements of an importing country have been complied with. All animals, AP/ABP imported into Canada or exported from Canada must meet the requirements of the importing country. The senior staff veterinary officers’ assigned duties within the Import Export section of TAHD include providing advice and veterinary expertise for veterinarians, producers and exporters and importers. Certain commodities such as livestock, poultry, animal embryos and animal semen and all rendered products exported from Canada must be accompanied by a health certificate issued (or endorsed) by a CFIA veterinary inspector. This is a Canadian legislative requirement.

The TAHD mandate encompasses the “One world, One health” concept. Senior staff veterinarians make the link between animal and public health throughout the scope of their work. As summarized by the Public Health Agency of Canada “The One World One Health (OWOH) concept proposes an international, interdisciplinary, cross-sectoral approach to surveillance, monitoring, prevention, control and mitigation of emerging diseases, as well as to environmental conservation (from OWOH Strategic Framework, 2008). It recognizes the linkages between animal, human and ecosystem health domains. Broadly stated, the OWOH concept provides a framework for
preventing emerging infectious diseases of animal origin, instead of simply responding to them once they have occurred.”

Various parameters that affect our work as federal regulators:
- Increasing trade/new commodities
- Increased public awareness and scrutiny of food safety and agricultural practices
- Increasing competition around urban areas for agricultural land
- Animal welfare linked to animal health;
- Emerging market access considerations for animal welfare and health (animal/public)

Import Export TAHD deals with import and export of live animals and germplasm, and animal products and animal by-products (AP/ABP). Import requirements are found in policies and procedures. These are outcome based; complying with Canadian regulatory requirements. CFIA has a flexible import permit system which allows the import conditions to referencing international standards of scientific bodies or scientific risk assessment. The exports side of our work ensures that Canadian animal, AP/ABP exports are certified to meet the sanitary requirements of the importing countries.

The main legislation for trade (import & export) in Animals, AP/ABP is the Health of Animals Act and Regulations, along with the associated Import Reference Document. This allows for the importation of animals, animal products, animal by-products, animal pathogens, and other things (such as used equipment) under certain conditions. The importer of animals, or their products or by-products is obligated to ensure compliance with the specific requirements of all CFIA policies and directives that fall under the pertinent legislative authority by animal or commodity, such as the Meat Inspection Act and Regulations, Feeds Act and Regulations, and the Fertilizers Act and Regulations.

The objective of the Export Program is to ensure that only healthy animals and animal products and by-products which meet the import health requirements of an importing country are exported from Canada, and that in the case of live animals they are transported in a humane manner. TAHD Senior Veterinary Officers are the export negotiators; they are assigned specific commodities; our duties are not assigned by country for either import or export, but rather commodity type, i.e. there are different import and export senior staff veterinarians assigned the following files: ruminants; swine; horses; poultry and birds; animal products and by-products.

The export senior staff veterinary negotiator is responsible for communications on certification with veterinary authorities (trading partners) concerning this commodity. They initiate negotiations when appropriate and negotiate the import conditions with officials of an importing country’s

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veterinary service. They ensure that agreed conditions of export reflect the Canadian situation and try to ensure the export certifications is as practical and as cost-effective as possible. They participate in missions abroad and host missions of foreign veterinary authorities visiting Canada.

Current export certificates can be found on the CFIA website: www.inspection.gc.ca/english/anima/heasan/export/exporte.shtml

Export Missions and Meetings (to Canada or overseas) in 2010 took place with the following trading partners:
1. Philippine and Taiwan – AP/ABP
2. Chile - Poultry and Semen (small ruminant)
3. Cooperation Council for the Arab States of the Gulf (GCC) - Live Cattle
4. China - Tallow (ABP)
5. USA - ABP

And in 2011 those that have occurred or are planned include the following:
1. China - ruminant semen and embryos
2. Russia trade union - certification; swine and cattle
3. Pakistan – small ruminants
4. Moldova – cattle
5. India – swine
6. Thailand – swine, cattle semen and embryos
7. China – AI and semen collection centers
8. COTASA – small ruminants

A senior staff veterinarian’s responsibilities (in both exports and imports) is to interpret and provide advice on export/import conditions to area/regional and operational staff; and the public; and trading partners. They also liaise with scientific staff in laboratories in Canada and elsewhere to ensure that tests being requested can be carried out, are based on OIE recommendations/valid science and are appropriate to the commodity.

The Import Program’s goal is to prevent the introduction of, or spread within Canada, of important diseases transmissible by animals, animal products or animal by-products as well as dealing with toxic substances. The development of import procedural directive includes the following considerations:
- Country of origin health status assessments
- Border controls in country of origin
- OIE standards, recommendations,
- Treatment and end use of the commodity
- Mitigation measures which can be applied
- Risk Analysis – product and country

To evaluate what will provide an acceptable level of protection to Canada while establishing import requirements, we consider several factors. Firstly, Canada’s domestic legislation, policies, and procedures must be adhered to. The country of origin: CFIA’s assessment of a country’s animal health status
for diseases of concern. Other factors which go into development of import conditions include the epidemiology of specific diseases; surveillance methods within the country of origin; knowledge of the country’s veterinary infrastructure and competency; CFIA official recognition of the animal health status of the country of origin; end use of the commodity; length of stay and purpose of the animal being imported; detailed nature of any processing of the commodity; OIE and other internationally recognized standards, guidelines, and recommendations; OIE disease information and recognition of the animal health status of the country of origin; and results of risk assessments (where applicable).

Our import and export consultation process is daily and both formal and informal; we use emails, letterhead, phone calls, and face-to-face meetings to help move things forward. Internal CFIA Consultations occur within TAHD, and Outside TAHD but still CFIA with the following sections and divisions or directorates (as applicable by animal or commodity):

• Export or Import Section
• Foreign Animal Disease and Emergency Management
• Humane Transportation
• Epidemiology and Surveillance
• Meat Programs
• Animal Welfare at Slaughter
• Plant Protection
• Operations (field) Branch
• Science Branch
• Policy Branch
• International section of Policy

External (to CFIA) consultations carried out by Import and Export may take place with the following departments, organizations, and sectors (as applicable by animal or commodity):

• Health Canada
• Public Health Agency of Canada (PHAC)
• Agriculture and Agri Food Canada (AAFC) Market Access Secretariat (MAS)
• World Organisation for Animal Health (OIE)
• Environment Canada
• CBSA
• Importers
• Exporters
• Relevant Canadian industry stakeholders
• Provincial authorities
• National associations
• Competent veterinary authority of other country
• World Trade Organization (WTO)
• Standards Council Canada
• Regional Opportunities Agency (i.e. Atlantic Canada Opportunities Agency)
Canadian Import Procedures and requirements for live animals, animal products and animal by-products can be found on the CFIA website at of Terrestrial Animal Health Import Policies www.inspection.gc.ca/english/anima/heasan/pol/pole.shtml#prod. Import requirements can also be accessed by using the Automated Import Reference System (AIRS). CFIA-AIRS is the automated import reference system of the Canadian Food Inspection Agency (CFIA). It is a user-friendly, searchable database of CFIA import requirements. Through a series of questions and answers, the system will lead you through the applicable regulations and policies to information on all CFIA import requirements for specific commodities. www.inspection.gc.ca/english/imp/airse.shtml

CFIA attempts to further refine the process for establishing import conditions by using best practices and published science; published documents are considered a living document, and are reviewed periodically. For example both FPA and iELISA are considered acceptable test methodologies by CFIA for export to Canada for brucella testing in swine pre-export.

Import section TAHD CFIA foreign missions in 2010 and 2011 (completed and scheduled) included:
1. USA – ABP
2. Argentina – Beef
3. Disease Status Evaluations
   1. Japan
   2. Brazil
   3. Colombia
4. Mexico/OIE meeting on international movement of horses
5. USA - ABP

Bilateral/Multilateral meetings which took place in 2010 and 2011 included:
1. QUADS (annual)
2. Crossborder Meeting with USDA APHIS
3. USAHA (annual)
4. EU export training
5. Brussels/Poland – JMC & Compartmentalization

Canadian Imports top 10 countries for the latest five years of horses, asses, mules and hinnies; bovine; swine; sheep & goats, poultry & turkeys; other live animals (including fishing bait) are visually represented in the graph following.
Canadian exports top 10 countries for the latest 5 years of horses, asses, mules and hinnies; bovine; swine; sheep & goats, poultry & turkeys; other live animals (including fishing bait) are visually represented in the graph following.
Imports to Canada of Bovine Semen the top 10 Countries for the latest 5 years is visually represented below.

Exports from Canada of Bovine Semen the top 10 Countries for the latest 5 years is visually represented below.
REPORT OF THE COMMITTEE

These charts, derived from Industry Canada’s website on Trade and Investment, “Trade Data Online” http://www.ic.gc.ca/sc_mrkt/tdst/tdo/tdo.php?lang=30&productType=HS6 are a clear demonstration that Canada and the USA are each others’ biggest trading partners for animals, AP/ABP.

More detailed tabular import export data from CFIA (only as accurate as the data supplied by district offices) is provided below for calendar years 2009 through 2010.

<table>
<thead>
<tr>
<th>Import Permits Issued</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pet Birds</td>
<td>45</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Poultry</td>
<td>44</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Day-old Chicks</td>
<td>45</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Bovines</td>
<td>751</td>
<td>610</td>
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<tr>
<td>Equine</td>
<td>312</td>
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<tr>
<td>Porcine</td>
<td>28</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Hatching Eggs</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>semen</td>
<td>956</td>
<td>798</td>
<td></td>
</tr>
<tr>
<td>embryos</td>
<td>120</td>
<td>101</td>
<td></td>
</tr>
<tr>
<td>Others Ov-Cap</td>
<td>161</td>
<td>147</td>
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</tr>
<tr>
<td>Others (Primates)</td>
<td>32</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Other (Bees)</td>
<td>66</td>
<td>88</td>
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</tr>
<tr>
<td>Other (Dogs)</td>
<td>134</td>
<td>125</td>
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<tr>
<td>Other</td>
<td>108</td>
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<tr>
<th>Permit Category</th>
<th>Applications</th>
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<th>Applications</th>
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<th>Applications</th>
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</thead>
<tbody>
<tr>
<td>2009</td>
<td>2,694</td>
<td>1,820</td>
<td>2,056</td>
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<tr>
<td>Live Animals &amp; Hatching Eggs</td>
<td>2,694</td>
<td>2,638</td>
<td>1,820</td>
<td>2,056</td>
<td></td>
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<tr>
<td>Embryos</td>
<td>127</td>
<td>101</td>
<td>104</td>
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<tr>
<td>semen</td>
<td>997</td>
<td>798</td>
<td>743</td>
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</tr>
</tbody>
</table>

IMPORT OF BOVINE SEMEN YEAR 2009-2010-2011

<table>
<thead>
<tr>
<th>Argentina</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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</thead>
<tbody>
<tr>
<td>Australia</td>
<td>19,415</td>
<td>737</td>
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<tr>
<td>Country</td>
<td>2009</td>
<td>2010</td>
<td>2011</td>
</tr>
<tr>
<td>-----------------------</td>
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<td>------</td>
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<tr>
<td>Austria</td>
<td>110</td>
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</tr>
<tr>
<td>Czech Republic</td>
<td>700</td>
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<td></td>
</tr>
<tr>
<td>Denmark</td>
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<tr>
<td>Dominican Republic</td>
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<td>France</td>
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<td>Germany</td>
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</tr>
<tr>
<td>Hungary</td>
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</tr>
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<td>Italy</td>
<td>1,400</td>
<td>9,415</td>
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<tr>
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## EXPORT OF BOVINE EMBRYOS
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**CERVINE EMBRYOS EXPORTS YEAR 2009-2010-2011**

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**OVINE EMBRYOS EXPORTS YEAR 2009-2010-2011**

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**IMPORT OF BOVINE EMBRYO YEAR 2009-2010-2011**

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**IMPORT OF OVINE EMBRYO YEAR 2009-2010-2011**

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**IMPORT OF EQUINE EMBRYO YEAR 2009-2010-2011**

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Summary – Communicating Across Species: Preparing For an FMD Outbreak
Presented by the FMD Cross-Species Communications Team
Cindy Cunningham, Assistant Vice President, Communications,
National Pork Board

If a widespread Foot and Mouth Disease (FMD) outbreak occurs in the United States, it will require a fast, unified and coordinated response from both livestock industry associations and the government. Prompted by the 2001 outbreak in the United Kingdom, the U.S. beef, pork, dairy and sheep industries recognized the need to prepare and take action, in case a similar situation were to arise in the country. As a result, the communications and issues management specialists from National Cattlemen’s Beef Association (NCBA), the National Pork Board (NPB), American Sheep Institute (ASI) and Dairy Management Inc. (DMI) have worked together to develop a coordinated communications response plan.

Consistent, Consumer-Friendly Messages

The variety of audiences who would need to be reached in the event of an outbreak is broad, stretching from domestic grocery shoppers to importers in numerous foreign countries. While a consistent plan for response across species is important, the plan will only be as successful as the strength of the message it distributes.

To develop a strong, well-tested set of core key messages, the FMD Cross-Species team conducted consumer research to better understand how consumers felt about perceived issues surrounding FMD. The research demonstrated consumers lack knowledge about FMD. In fact, when surveyed, 72 percent of consumers thought FMD affected humans. Another 69 percent of consumers believed they could contract FMD from eating infected meat. These findings alone demonstrated the numerous misconceptions that would need to quickly be addressed in the event of an outbreak.

Messaging research also helped identify words and spokespersons that resonated or did not resonate with audiences. For example, audiences want to hear “there is a plan” and hear about successful examples of managing a similar situation. Words that work include reassurances that FMD is not a human health risk and does not affect the safety of milk or meat. On the other hand, audiences do not want to hear about quarantines, roadblocks or euthanasia. Messages referencing the economic devastation or the desire for livestock producers to protect their livelihood are not as well accepted.

Based on these understandings, the FMD team created a set of core messages to serve as the foundation of all communications about the disease. The simplicity of the messages is part of their power, as they address the misconception that FMD affects people and reassure consumers that a plan is in place and people are working together to execute it.
**Message Deliverers**

The team’s research also identified the types messengers who would best resonate with the public during outreach and education following an outbreak.

- **Industry spokespeople** are the most credible and reassuring when responses are consistent and provided by a variety of sources.
- **Livestock producers** are credible when speaking about the actions farmers take on the farm and how they cooperate with officials.
- **Local government officials** are more credible than federal agencies because they are connected to the community.
- **Veterinarians** are most credible for consumer health information about FMD.

**Information in Action**

With core messages and a baseline understanding about how to communicate during an outbreak, the FMD team continues to receive feedback and insights from various stakeholders to improve the plan and approach. Such planning and reliable partnerships will help position the industry to respond in a unified manner, ensure consumer confidence in meat and milk safety, alleviate confusion and concern and help protect animal health and the livestock industry.
REPORT OF THE COMMITTEE

Animal Health and Trade Possibilities in Mexico, Central America, and the Caribbean
Arnaldo Vaquer, DVM, MBA
VAQUER INC.

I retired from Veterinary Services, APHIS, USDA early in 2007 after 30 years of service with the agency. A year later I began consulting with Foreign Agricultural Services, USDA in animal health and international trade for the Central America Free Trade Agreement-Dominican Republic (CAFTA-DR).

In the last several months I have started consulting for the OIRSA, an International Regional Organization of Animal and Plant Health based in El Salvador. OIRSA has nine member countries, which comprise Mexico and all the Central American Countries down to Panama and the Dominican Republic in the Caribbean.

The objective was and is to help the Central American countries to meet VS, APHIS, USDA, OIE and other international sanitary standards in order to allow these countries to export animal products (poultry meat, pork, beef, bovine semen and embryos) to the United States and the rest of the world.

Mexico, Central America, and the Dominican Republic veterinary programs of disease eradication, veterinary infrastructure, veterinary diagnostic capabilities, animal disease surveillance systems, and other aspects of their national veterinary programs need to be upgraded and updated in order to meet international standards.

In order to export meat products to the United States a country needs to meet USA requirements on two fronts: animal health conditions required by VS, APHIS, USDA and Inspection regulations equivalence and other processing plant sanitary standards required by FSIS, USDA. If a country wants to export poultry meat into the USA, it needs to be free of Exotic Newcastle Disease (END) and Highly Pathogenic Avian Influenza (HPAI), as examples of animal health conditions. Another example would be for a country to be free of Classical Swine Fever (CSF), and African Swine Fever (ASF) before it can export pork products.

Their national meat inspection regulations and their processing plants sanitary standards must have been evaluated by the equivalence staff of FSIS, USDA and found to be “equivalent” to U.S. standards before the export can proceed.

The United States uses the process of “Regionalization” to determine if a country is free of a given disease. This process is detailed in title 9 of the Code of Federal Regulations (9CFR), Part 92.2, and it uses 11 factors to evaluate a country for freedom of disease. Once a country is determined to be free of a given disease, it needs to be added to the 9CFR as to allow the importation of certain products into the United States.

The process of “Rulemaking,” required by the Administrative Procedures Act and other executive orders is used to clear the new rule and be written into the 9CFR. This rulemaking process is also regulated by the Office of
Management and Budget (OMB), if the proposed rule is deemed “significant” or higher. Also the new rule must undergo legal and policy review by the Office of the General Council (OGC). The “proposed rule” is published in the *Federal Register* for up to a 60 day comment. Finally, if it is cleared, then it is re-published in the *Federal Register* as a “Final Rule” and written into the 9CFR.

Both of these processes can take up to 6 years or longer to complete. That is one of the reasons I give the countries to be assisted the presentation covering both processes. I also give assisted countries a presentation about the “National Veterinary Accreditation Program of the United States” to meet the requirements of factor # 1 (country must have an adequate veterinary infrastructure) in 9CFR Part 92.2 cited above.

The country uses “Export Certificates” provided by FSIS, USDA to certify that the meat comes from animals that received ante-mortem and post-mortem inspection in approved plants, and that the meat has not been adulterated or mislabeled and is in sanitary conditions. This certificate must be signed and stamped by authorized officials of the exporting country. This certificate must be both in English and the language of the exporting country.

The most difficult and expensive part for the country which wants to export internationally is to meet the requirements imposed by the importing countries. A national animal health system capable of delivering disease-free, healthy animals and sanitary animal products to the world is a very complex and expensive system of interlocking parts. This system must be maintained and managed by highly educated, capable, and experienced professional personnel. Most of these countries are lacking in both, the system and the personnel.
REPORT OF THE COMMITTEE ON INFECTIOUS DISEASES OF CATTLE, BISON, AND CAMELIDS

Chair: James Evermann, WA
Vice Chair: Chuck Massengill, MO

Helen Acland, PA; Chris Ashworth, AR; Yugendar Bommineni, NM; Charlie Broaddus, VA; Charles Brown, II, WI; Beth Carlson, ND; Jim Collins, GA; Karen Conyngham, TX; Stephen Crawford, NH; Daniel Crowell, NV; Edward Dubovi, NY; Anita Edmondson, CA; James England, ID; Robert Fulton, OK; Dorothy Geale, CAN; Dale Grotelueschen, NE; Thomas Hairgrove, TX; Rod Hall, OK; Del Hensel, CO; Floyd Horn, MD; Dennis Hughes, NE; David Hunter, MT; Paul Jones, AL; Bruce King, UT; John Lawrence, ME; James Leafstedt, SD; Howard Lehmkuhl, IA; Rick Linscott, ME; Pat Long, TN; Janet Maass, CO; Richard Mock, NC; Cheryl Nelson, KY; Jeanne Rankin, MT; Julia Ridpath, IA; Bill Sauble, NM; Nick Striegel, CO; R. Flint Taylor, NM; George Teagarden, KS; Susan Tellez, TX; Robert M. Temple, OH; Charles Thoen, IA; Kenneth Throlson, ND; Paul Virkler, NY; Annette Whiteford, CA; Brad Williams, TX; William Wilson, KS; George Winegar, MI.

The Committee met on Oct. 2, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 12:30 p.m. to 5:30 p.m. There were 15 members and 29 guests present. Dr. Evermann welcomed the Committee members, guests, and speakers, and extended thanks for their attendance. An announcement was made about the 5th BVDV Symposia Nov. 17 and 18, 2011, in San Diego, Calif. Dr. Evermann encouraged attendees to attend the symposium.

Memorial Tribute to Bob Frost, Long-Time Llama Owner and Past President of USAHA

Karen Conyngham, International Llama Registry (ILA) representative to the U.S. Animal Health Association (USAHA) Board of Directors and Dr. Murray E. Fowler.

It is with great sadness that I report the death of Bob Frost after a courageous battle with cancer. Bob passed away at his home in Lincoln, Calif., on Aug. 15, 2011, with his loving wife, Bonnie, and his son Austin at his side.

Bob’s interest in camelid medicine and animal health relations with governmental agencies dates back to 1979 when he began his llama herd. He worked closely with the school of veterinary medicine at UC Davis on llama medical research projects, especially with Dr. Murray Fowler. Bob offered his herd to the camelid medicine club at Davis for semi-annual herd health checks and often opened his California ranch as a venue for the Alpaca & Llama Show Assoc. (ALSA) to host judge and owner training clinics.
that taught the correct evaluation of unique camelid conformation and behavior.

Bob had the only closed llama herd in the U.S. dating from 1991 to the present. All llamas that died on his property were taken to Davis for full necropsy. It was his intention that his herd could be used for any studies needed on Bovine tuberculosis, West Nile Virus or Chronic Wasting Disease.

His wildlife and livestock endeavors brought Bob to the United States Animal Health Association (USAHA) in 1989. In August 1990, the Canadian government closed the border to the importation of U.S. camels due to the lack of a validated live animal test for *Mycobacterium bovis*. This issue became a concern after outbreaks of TB occurred in farmed deer and elk and Canadian officials suspected llamas and alpacas were also causing TB outbreaks. Bob became deeply involved in the TB issue through his Intl. Llama Association (ILA) and USAHA connections, working to demonstrate to provincial and state regulatory officials that llamas/alpacas were not carriers of TB and did not pose a TB threat to livestock or wildlife. Through Bob’s efforts working with ILA and USAHA, the Canadian and U.S. governments spent over $500,000 on camelid TB diagnostic research. The Canadian border finally reopened to camelids in 1997.

One of the most important camelid papers presented at USAHA, “Prevalence of Selected Diseases of Llamas and Alpacas” authored by Dr. Murray E. Fowler and Bob Frost, was issued at the 1999 USAHA annual meeting. This paper is still used as a reference document by state and federal agencies.

Bob was elected 3rd VP of USAHA in 1999 and also represented the ILA on the USAHA Board from 1999-2004. He served as USAHA President in 2003, the only llama owner ever to hold this position. He worked tirelessly in support of the development of the National Animal Health Laboratory Network (NAHLN) and the Ames Master Plan to modernize the three federal reference animal health laboratories in Ames, Iowa.

For several years Bob co-chaired the USAHA Committee on Diagnostic Laboratory and Veterinary Workforce Development – a committee which he established – with Dr. Bennie Osburn. He was also responsible for creating the USAHA Committee on International Standards which focuses on improving global animal health and security and includes members from many countries. He served on the Secretary of Agriculture’s National Wildlife Services Advisory Committee.

Bob’s many contributions to the camelid community and to USAHA will not be forgotten.

**Update from BVDV Subcommittee**
Jim Evermann, Chair

Dr. Evermann read the report from the Bovine Virus Diarrhea Virus (BVDV) Subcommittee submitted by Dr. Julia Ridpath. The report included an update on the location of NADC, NVSL, and CVB on the same campus at Ames, Iowa. The new laboratory includes state of the art facilities for BL2
and BL3 containment barns. The priority of the bovine research will be respiratory diseases and will look at elements of genetic resistance to disease.

**Fetal Bovine Sera**
**Dr. Donna Gatewood, USDA-APHIS-VS-CVB**

Dr. Gatewood described the Center for Biologics (CVB) requirements for ingredients of animal origin, which includes fetal bovine serum (FBS). Nine CFR testing requirements include tests for bacteria and fungi, mycoplasma, cytopathic/hemadsorbing agents and extraneous viruses by fluorescent antibody technique (FA). More specifically, ingredients of bovine origin must be tested for the following by FA: Bovine Virus Diarrhea Virus (BVDV), Rabies virus, Reovirus, Bovine Adenovirus, Bovine parvovirus, and Bovine respiratory syncytial virus.

Dr. Gatewood discussed the scope of CVB’S authority with regard to FBS, and pointed out gaps which could allow for the introduction of contaminants that might go undetected. Many vaccine manufacturers rely on Certificates of Analysis from FBS suppliers, most of who state that their FBS is tested in accordance with 9CFR. CVB’s expectation is that manufacturers conduct vendor audits, but there are no regulations requiring this. Further, CVB does not have the authority to conduct audits on suppliers of raw materials, so they are not able to verify that testing is being conducted correctly. The CVB does not have authority over the importation or labeling of FBS.

There was a discussion by the Committee of the risk assessment for use of FBS in the production of veterinary biologics. There were three concerns. They are 1) potential for imported FBS being re-labeled as “made in the U.S.”, 2) blending of U. S.–sourced FBS with imported FBS, then labeled as “made in the U.S.”, and 3) lack of monitoring of FBS source herds either U.S. or imported. The Committee decided to establish a subcommittee to prepare a draft resolution asking APHIS to identify the sensitivity of the assays used in approval of FBS for use in U.S. biologics. This would also include more stringent requirements for detecting BVDV and new related pestiviruses. The subcommittee is to present the resolution for the Committee’s consideration at the 2012 USAHA meeting.

**Rift Valley Fever Review and Update on Veterinary and Wildlife Surveillance in Kenya**
**Dr. William Wilson, USDA-ARS**

The presentation gave a thorough overview of Rift Valley Fever (RVF), its Multi Host Range (including cattle, camels/alpacas, and other small ruminants), its epidemiology, geographic distribution, the potential U.S. mosquito vectors, vaccine availability, and its zoonotic potential. He reviewed Diagnostic tests available including Antigen capture ELISA, serology, and PCR. He is working on a field deployable and a high throughput PCR assay for RVF.
Anaplasmosis and Babesiosis review
Dr. Massaro Ueti, USDA-ARS, Pullman, WA

The presentation reviewed these tick borne agents concentrating on different strains of pathogens and their replication in ticks. Dr. Ueti reported that Bovine babesiosis and anaplasmosis causes losses greater than $800 million per year in Latin America. And bovine anaplasmosis causes losses greater than $300 million per year in the U.S.

The focus is to prepare an effective vaccine for each of the respective diseases.

Parasitic infections of alpacas and llamas
Dr. Patrick Long, Camelid Health Care Services

The presentation reviewed two key parasites of llamas and alpacas. Dr. Long presented the history, clinical disease, epidemiology, diagnosis and treatment of Eimeria macusaniensas (E.Mac). He then presented the history of Mycoplasma hemolamae, clinical presentations, its epidemiology, diagnosis, and treatment. He explained that chronic, asymptomatic carriers are present in both of these diseases. Dr. Long also gave a report on the diagnosis of Granulocytic Ehrlichiosis in camelids in the U.S.

Piroplasmosis review
Dr. Andy Schwartz, Epidemiologist, Texas Animal Health Commission

The investigation of south Texas index case of Equine Piroplasmosis (EP), initiated in October 2009, was completed more than one year ago. No additional related cases have been disclosed since, helping to confirm that the investigation and tracing of exposed horses was thorough and effective. Affected horses not euthanized are being held under quarantine. Use of these animals is allowed on the quarantine premises only. Treatment studies are ongoing, using the ARS recommended protocol. Results of the treatment are very promising.

From October 2009 through June 2011, more than 30,000 Texas horses were tested for EP. Most of these tests were for movement interstate or to events. The test positive prevalence in these horses is approximately 0.25%, excluding testing associated with the index ranch investigation. The national test prevalence during this same time period was approximately 0.13%, based on information provided in the National EP Situation Report.

In Texas, EP affected horses fall into three categories: Index case associated, international imports on the CF test, and Quarter Horse racehorses. Almost all cases disclosed in Texas over the past year were in the QH racehorse population. Disease spread among this population is thought to be iatrogenic.

To address the QH racehorse situation, the Texas Animal Health Commission (TAHC) passed rules earlier this year requiring a 12 month EP test to enter racetracks, and requiring all EP tests be done on a TAHC test record.
A resolution was passed at the USAHA 2010 Annual Meeting requesting information on horses imported into the U.S. during 1995 – 2005, on the CF test. Records show approximately 9,000 horses entered Texas during this time. Efforts are underway to contact owners of these horses imported in 2005, offering a test at no cost. Results of this effort will be used to gauge additional tracing and contacts.

Cattle Fever Tick report from Texas
Dr. Dee Ellis, Texas State Veterinarian

USDA/TAHC cooperative fever tick eradication activities for 2011 were reviewed. There are currently 109 infested premises under quarantine. Seventy-six of those are in the permanent quarantine zone and 33 in the “free” area of south Texas. Although infested premises are still at high levels, over the last two years the infested premises have been pushed from primarily in the free area to now located primarily in quarantine area. At the beginning of 2011 there were 3 temporary “blanket” quarantine zones in the free area of Texas. Two of those three zones have been completely released, and the third zone has been downsized. This is an indication of the success of the program in recent years.

Wildlife infestations continue to pose unique problems for the program, especially on premises vacated of cattle. Flooding of the Rio Grande in 2010 pushed deer from historic habitats in close proximity of the Rio Grande river – farther into the mainland including parts of the free area. Special emphasis has been placed on surveillance of deer, treatment of deer, and better oversight/epidemiology of all infested premises to determine reasons for infestation and thus which corrective actions are appropriate. TAHC and USDA-VS continue to partner with USDA-ARS to research possible tools for future use including tick vaccines and self-treatment products such as Ivermectin laden molasses blocks.

Committee Business
There were no resolutions or business items brought before the Committee.
The Committee met on October 3, 2011 at the Adam’s Mark Hotel in Buffalo, New York, from 1:00 – 6:00 p.m. There were 34 members and 49 guests present. The meeting was chaired by Dr. Kent Fowler. Discussion included the desire and need for a National Monthly Equine Conference Call such as was previously conducted by Dr. Tim Cordes. Dr. Fowler will initiate and organize the first call in November 2011. The possibility was raised to rotate the leadership of this call through volunteers.

Time-Specific Paper:
Dr. Peter Timoney, Gluck Equine Research Center, University of Kentucky, presented a time-specific paper on “Resurgence of Glanders: A Cause for Increasing International Concern”. The paper, in its entirety, is included at the end of this report.

Hendra and West Nile Viruses in Australia – What is Happening, What is New?
Peter Kirkland, B.V.Sc., PhD, Veterinary Virology Lab, Elizabeth Macarthur Agricultural Institute (EMAI), Camden, Australia

This Powerpoint presentation is available online.
Equine Piroplasmosis - Texas Situation Update
Andy Schwartz, DVM, Texas Animal Health Commission

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Efficacy of Imidocarb Diproprionate Against Theileria equi in Experimentally Infected Horses
Dr. Juanita Grause, USDA-APHIS-NVSL, Serology Section of Diagnostic Bacteriology Lab

*Theileria equi*, one of the causative agents of equine piroplasmosis, is endemic in many regions of the world but is considered a foreign animal disease in the United States. In an effort to exclude *T. equi*, the U.S. practices stringent serological screening of horses prior to entry. The discovery of *T. equi* infection in U.S. horses was an impetus for this study. Current sanctioned options available in cases of infected domestic horses include euthanasia and permanent quarantine. Chemotherapeutics that eliminate infection and subsequently transmission risk are a critical need for
In this study, we sought to determine whether imidocarb dipropionate treatment of experimentally infected horses would eliminate *T. equi* infection. Previous studies testing the efficacy of imidocarb dipropionate yielded conflicting results. Here, nine horses were experimentally inoculated with *T. equi*, and six of these were treated with imidocarb dipropionate after the resolution of acute disease. Parasite elimination was demonstrated in all but one horse by the following tests: nested polymerase chain reaction, intravenous blood transfusion from treated to naïve horses, and reversion to seronegative status by CFT, IFA and cELISA. These data show imidocarb dipropionate was capable of eliminating infection in 83% of the horses experimentally infected with an isolate of *T. equi* derived from an infected horse previously imported from Peru.

**Update on Detection of Persistent Infection of *T. equi* and *B. caballi***

Dr. Don Knowles, Animal Disease Research Unit, ARS-USDA-PWA and Department of Veterinary Microbiology and Pathology, Washington State University

The re-emergence of Theileria causing infection and disease in U.S. horses has led to research testing for methods to eliminate persistent infection. Imidocarb dipropionate is proving effective in eliminating persistent *T. equi* infection in a high percentage of U.S. horses. Also, nested PCR and serologic testing is showing utility in demonstrating *T. equi* elimination from persistently infected horses. Concurrent with the re-emergence of *T. equi*, increased surveillance for infection of U.S. horses with *Babesia caballi* has revealed a small number of U.S. horses with serologic evidence of infection. These horses, those with serological evidence of infection with *B. caballi*, are being studied by additional methods of detection to determine their true serologic and infection status.

**Equine Herpesvirus Myeloencephalopathy (EHM) Outbreak Associated with an Equine Event in Ogden, Utah 2011**

Angela M. Pelzel, DVM, USDA-APHIS, Veterinary Services

On May 13, 2011, cases of equine herpesvirus myeloencephalopathy (EHM) caused by equine herpesvirus-1 (EHV-1) began to be identified in horses that had recently attended a regional cutting horse event in Ogden, Utah from April 29-May 8, 2011. A total of 421 horses were considered to have been exposed to the virus at the event and subsequently traveled to 19 different states potentially exposing more than 1,685 additional horses. Due to misinformation being widely circulated through social media channels, equine industry groups and state animal health officials requested USDA-APHIS-Veterinary Services’ (VS) assistance in gathering and distributing accurate national case information during the incident. APHIS-VS additionally provided standardized guidance to the state animal health officials on recommended management of infected and exposed horses. The incident was considered closed on June 23, 2011 after no more new
cases were being identified. Despite quick intervention by the equine industry, individual horse owners and trainers, and state animal health officials, a total of 90 confirmed EHV-1 or EHM cases were identified in association with the outbreak. Of the 90 confirmed cases, 54 cases were in horses that attended the Ogden, Utah event. A total of 13 horses died or were euthanized during the outbreak. APHIS-VS is currently conducting a retrospective EHV-1 study to more fully characterize the cases, assess the economic impact and identify potential risk factors involved in the outbreak.

**Equine Infectious Anemia Proposed Rule**

Troy T. Bigelow, DVM, Staff Veterinarian, USDA-APHIS-VS-NCAHP-ASEP

The U.S. equine industry and stakeholders are important to the USDA. The USDA has been listening to your concerns, assisting with disease outbreaks such as EHV, and working on animal health rules to protect the equine industry.

2010 EIA testing data identified 47 horses on 30 separate premises as positive. This is consistent with previous years.

USDA Veterinary Services recognizes previous USAHA resolutions asking USDA to place the EIA UMR in to the CFR. Veterinary Services has started the rule making process where a proposed EIA rule is being drafted for publication in the Federal Register. The EIA proposed rule is comprehensive and covers all aspects of EIA including movement requirements, handling of exposed and reactor animals, and laboratory testing requirements. The proposed rule is designed to be comprehensive yet flexible to allow for future change. This rule will assist States by creating consistent standards for EIA.

USDA Veterinary Services has also been developing rules for contagious equine merits (CEM). The interim CEM rule published in the Federal Register March 25, 2011 was seeking comments on testing requirements for stallions, testing imported mares and requirements for stallions. Enforcement of the CEM interim rule is currently on indefinite delay while comments are being reviewed. That said, per the recommendation from a recent reviews VS is developing a CEM database. The database developed in APHIS SharePoint will receive data via an Excel spreadsheet designed to facilitate entry into the SharePoint database. Summary information can be provided to states about the State’s activities.

**Importation of Horses from CEM-Affected Countries USDA-APHIS-VS**

March 2011 CEM Rule – Process Summary: Kentucky State’s Perspective

Mr. Rusty Ford, Equine Programs Manager, Kentucky Department Agriculture, Office State Veterinarian

This paper is presented in its entirety at the end of this report.
Committee Business

Following conclusion of the scientific program, the Committee went into Business Session. Two resolutions on Equine Piroplasmosis (EP) were considered, approved and forwarded to the Committee on Nominations and Resolutions for approval by the general membership. One of these resolutions requests that USDA-APHIS-VS develop and publish guidelines for the release from State quarantine of test negative Equine Piroplasmosis (T. equi) equids that meet given qualifications. The other EP resolution urges USDA-APHIS-VS-NCIE to require both a negative Complement Fixation (CFT) and negative cELISA test for importation of equids into the U.S. A resolution to support NAHLN annual funding was also considered, approved and forwarded to the Committee on Nominations and Resolutions for approval by general membership.
Since the USAHA meeting in November 2010 there has been significant national EP surveillance and research accomplished. EP testing of horses has been driven through industry as well as regulatory authorities. Industry testing has occurred thorough multiple routes including, sanctioned race tracks and breed sponsored events and sales. Regulatory testing has been done primarily though disease investigations, and required international export and interstate testing.

Since November 2009 there have been more than 130,000 horses tested in the U.S., with 176 horses determined to be positive for EP (excludes the horses detected as positive during the investigation of the 2009 Texas ranch outbreak). All of the positive EP horses, except one with ongoing investigation, have been in one of two high risk categories; those horses imported prior to August 2005 using the CF test and those Quarter Horses involved in racing.

There has been a large amount of EP research done in the past year, with several significant discoveries. Most of this research has occurred at USDA, VS, ARS in Pullman Washington and has included; confirmation that *Ambylomma cajennense* is a competent vector for the transmission of *Babesia equi*; Imidocarb diproprinate can be a successful treatment to clear EP infected horses of the organism *Babesia equi*; and the development of a diagnostic test that will detect the clearance of organism from a treated EP infected horse.

During the past year the EP Subcommittee held two meetings which took place via conference calls. The primary efforts of the subcommittee were focused on discussing the Long-Term Recommendations of the EP Working Group, the issue with false positive *Babesia caballi* results on the commercial cELISA test kit, the most recent EP research findings.

The EP Subcommittee drafted two resolutions for presentation at the Infectious Diseases of Horses Committee.

Significant points of information and discussion were:

- **Update on status of the EPWG long-term recommendations**
  - Comments were reviewed by the USDA-APHIS-VS management team and staff and specific responses have been drafted for each recommendation. The VS Management Team is currently reviewing the draft responses. The final responses to each recommendation should be sent to the National EP Working Group soon.

- **B. caballi** suspect case follow-up protocol
  - There have been a small number of *B. caballi*, cELISA positive results on horses that have had no epidemiological link to high
risk disciplines or management and have been of low risk signalment and/or of low risk breed. These same cases have been yielding discrepant results on additional testing. In those cases, additional testing using new diagnostics at NVSL and USDA, ARS in Pullman are being utilized to assist in the true determination of the horse’s status. In many of those cases, while the cELISA is at the 40% inhibition level or higher it is believed that the result is a false positive and the test is reacting to a protein not originating from the *B. caballi* organism.

- In some cases, transfusion from one of these cELISA positive horses to an uninfected, splenectomized horse has been done. In those cases, the transfusion data has supported the additional testing conclusion of the horse being negative for the *B. caballi* organism.
- The final determination of the horse’s status in such cases is made jointly by USDA, VS staff and the Chief State Animal Health Official.

- Current Research at ARS Pullman
  - ARS in Pullman, WA has facilitated treatment of horses in several states, including 150 horses from the Texas index ranch for *B. equi*. Of the 150 Texas horses treated, 147 of those horses were treated successfully (cleared of organism).
  - ARS, Pullman is continuing to work on validating a clearance test for use after treatment of infected horses. The hope is to have a test that will be accurate in detection of actual infection and will be accepted by U.S. trading partners and regulatory authorities in the U.S.
  - Glen Scoles of ARS, Pullman, WA is the lead author on a paper documenting transmission of *B. equi* by adult *Amblochma cajennense* ticks in Texas.

- Other Discussion
  - The issue of EP testing of horses being shipped from Puerto Rico to the U.S. mainland is occurring using the cELISA test for both *B. caballi* and *B. equi*. Currently these horses are being tested as a matter of policy due to the USDA tick quarantine.
  - National Veterinary Services Laboratories runs the cELISA and complement fixation test (CFT) for horses being imported into the U.S. A small number of these horses are negative on the cELISA and positive on the CFT. There is discussion to make the cELISA and CFT required for import and classify horses that test positive for either test as a positive for EP (reactor), which is consistent with domestic protocol as stated in VS Memorandum 555.20.
Introduction:

Glanders is a highly contagious bacterial disease of equids that has been known to afflict equine populations for well over 2,000 years since recorded by Aristotle in 350 BC. Some in the major horse breeding and performance countries would regard glanders purely of historical interest, whose geographic distribution is restricted to certain countries/regions of the world where it has been endemic for many centuries. As such, it is not perceived of importance as a potential threat to equine health. This would have been a reasonable assumption prior to the advent of horse transportation by jet aircraft some 50 to 60 years ago. Circumstances have changed dramatically over the intervening years, however, and it is now possible to ship horses by air to almost anywhere around the globe. Continued expansion in the volume of international movements of horses unfortunately, is not without attendant concerns. Although economically beneficial for the equine industries in many countries, the increase in trade is linked to a greater risk of spread of a wide range of equine infectious diseases (Timoney, 2007). In certain instances, diseases have been introduced into naïve equine populations in countries previously free of such infections, or from which they may have been eradicated at some point in the past. This has resulted not only in economic hardship for the industry concerned, but also in a paradigm shift in the global distribution of particular equine diseases including glanders.

General Features and Significance

The etiological agent of glanders is *Burkholderia mallei*, a bacterium that was first discovered by Loeffler and Schuetz in 1862 (Loeffler, 1886). Aside from its significance as a disease of equids, glanders is also widely considered one of the most important zoonotic diseases, a fact that was suspected as far back as 1830. In view of how readily it can be transmitted to humans and the serious consequences of infection, *B. mallei* was one of the first infectious agents to be used for biological warfare purposes (Lehavi *et al*., 2002; Wittig *et al*., 2006). Together with dourine, glanders was included amongst the nine most significantly regarded diseases of livestock at the time that led to the establishment of the Office International des Epizooties (O.I.E.) in 1924. It is an O.I.E. listed equine disease and because of the importance of *B. mallei* both as an equine and a human pathogen, outbreaks involving equids must be notified immediately to the O.I.E., now the World Organisation for Animal Health (Anon, 2010).
INFECTIOUS DISEASES OF HORSES

Host Range

Although glanders is a disease primarily of equids, it can also affect humans and sometimes, Felidae, camels, bears and walruses (Hunting, 1887; Fernandez and White, 2010; Wernery et al., 2011). Amongst the family Equidae, donkeys are most susceptible, mules less so and horses still less again, especially cases of chronic infection in endemic areas (Wittig et al., 2006). Whereas cattle and swine are resistant to infection, small ruminants can become infected if maintained in close contact with affected horses. Glanders can also occur in carnivores that have had access to infected meat.

Known Geographic Distribution

Glanders is endemic in various regions of the world including but not exclusive of Asia, the Middle East and South America (Wittig et al., 2006; Wernery, 2011). The disease status of Africa and parts of the former Soviet Union is presently unknown. The following countries have reported or are believed to have had outbreaks of glanders since 1998: Afghanistan, Bahrain, Brazil, India, Iran, Iraq, Kuwait, Lebanon, Mongolia, Pakistan, P.R. China, Syria, Turkey and the United Arab Emirates. Disease events over the past 5 to 10 years, however, would indicate that glanders is no longer as geographically restricted in terms of its global distribution as previously believed. More recent outbreaks in countries from which it was previously eradicated e.g. Bahrain, Lebanon and the United Arab Emirates, heighten the risk of further spread through international horse movements. Furthermore, there have been reports from certain countries in which glanders continues to be endemic e.g. India, of a resurgence in the frequency and extensiveness of outbreaks of the disease in certain states (Malik et al., 2010; Pawaiya and Chauhan, 2008). Accordingly, it behooves veterinary practitioners and animal health officials alike to be more aware of the disease and more conscious of the risks inherent in the importation of horses from certain countries/regions of the world of unknown or questionable glanders status.

The importance of the risk assessment when considering such shipments cannot be over emphasized. This can best be illustrated by the case of an eight-year-old Crioula mare that was imported into Germany from the state of São Paulo, Brazil, in 2006 (Elschner et al., 2009). Reportedly, glanders had not occurred in the area of the state where the horse had been located within six months immediately prior to export. Furthermore, the mare was certified as negative for complement-fixing (CF) antibodies to \( B. \textit{mallei} \) at a serum dilution of 1:10. Within two weeks following her arrival in Germany, she developed an elevated temperature, signs of respiratory illness followed by evidence of an exudative lymphangitis involving metacarpal and metatarsal regions of some of her limbs. Initially, the attending veterinarian believed the mare had a routine respiratory tract infection and treated her accordingly. It was only after the respiratory signs were unresponsive to repeated treatments that glanders was considered a
remotely possible cause of the mare’s illness. All appropriate laboratory examinations were carried out to establish whether this indeed could be the case. These confirmed a diagnosis of glanders. Very fortunately, the disease was confined to the index case and there was no spread of infection off the affected premises.

A more recent glanders scare involved a horse that was imported from Lebanon into Switzerland via Germany in January 2011 (International Collating Centre Report, 2011). The following month, an outbreak of glanders occurred in Lebanon, affecting at least 25 horses. Once official notification of the disease was received by Switzerland sometime later, the imported animal was located, quarantined and serologically tested. The initial result on the horse, which had remained clinically normal, was positive for glanders. However, a retest was conducted by the O.I.E. Reference Laboratory for glanders in Germany and this failed to confirm the earlier finding. After due consideration, the horse was determined to be uninfected with *B. mallei*. Although the outcome was favorable, this incident reemphasizes the risks associated with the shipment of horses from countries of questionable glanders-free status, and also, how easily this disease could have been introduced on the occasion of this particular importation.

**Modes of Transmission**

Glanders can be transmitted by direct or indirect means. Most commonly, it is spread through direct physical contact with horses affected with nasal or pulmonary forms of the disease (Hunting, 1887; Fernandez and White, 2010). Indirectly, glanders can be transmitted through the ingestion of food or drinking water contaminated with discharges from the respiratory tract or ulcerated skin lesions of affected horses. It can also be contracted through horses sharing feed troughs/containers, water bowls/buckets, or items of harness contaminated with infective material. The risk of spread of the disease is enhanced under conditions of stress or overcrowding. The importance of the subclinically infected carrier animal cannot be over emphasized as the reservoir and means of persistence and dissemination of *B. mallei* in equine populations in which glanders is endemic.

**Clinical Forms of the Disease**

Glanders can present in several forms, nasal pulmonary and cutaneous, depending on location of the primary lesion (Hunting, 1887; Fernandez and White, 2010; Wittig *et al.*, 2006). Individual horses may be affected with more than one form of the disease. The incubation period can range from a few days up to six months, based on various agent, host and environmental factors. Horses can be acutely/chronically infected with *B. mallei*. If untreated, cases of glanders are usually fatal. Acutely affected horses die within a few days to several weeks.

-- Nasal form: Horses affected with this form of the disease developed a high fever, anorexia, coughing and become dyspneic. They present with a
viscous, yellowish-green, mucoid or sanginopurulent nasal discharge. This may be accompanied by a purulent ocular discharge. Nodules become evident in the nasal mucosa which subsequently ulcerate and later form stellate scars.

-- Pulmonary form: This acute form of glanders is associated with a prolonged incubation period that can extend up to six months. Affected animals develop fever, dyspnea and a persistent cough. Diarrhea and polyuria may supervene in some infected horses, leading to progressive loss of bodily condition.

-- Cutaneous form (farcy): Ulcerative lymphangitis or farcy usually develops over an extended period of time. Initial signs of farcy include fever, dyspnea, coughing, lymphadenomegaly and lymphangitis. Periods of exacerbation of clinical signs follow, resulting in increasing weight loss and debilitation. The cutaneous form of the disease is characterized by the development of subcutaneous nodules along the course of the lymphatics of the face, legs, costal region or ventral abdomen. Nodules frequently rupture and ulcerate, giving rise to a multifocal ulcerative dermatitis. Affected lymphatics, which are swollen and frequently considerably thickened, are popularly referred to as “farcy pipes”.

Differential Diagnoses for Glanders: There are a significant number of other infectious diseases, bacterial, fungal or viral, that, based on their clinical features, need to be considered in the context of a differential diagnosis for glanders (Fernandez and White, 2010). These include: melioidosis (B. pseudomallei), strangles (Streptococcus equi), ulcerative lymphangitis (Corynebacterium pseudotuberculosis), epizootic lymphangitis (Histoplasma capsulatum var. farcinimosum), tuberculosis (Mycobacterium avium ssp avium, M. bovis), sporotrichosis (Sporotrichum schenckii), botryomycosis (Staphylococcus aureus and certain other bacteria), horsepox.

**Diagnosis**

It is important to emphasize that the clinical signs associated with the early stage or carrier stage of glanders are not confirmatory per se. Establishment of a diagnosis of the disease is based on the outcome of various in vivo and in vitro laboratory tests (Allen, 1929). The mallein test [intradermo-palpebral (most sensitive and reliable), the ophthalmic or subcutaneous route of administration] is a very useful test that can be performed on a suspect case of glanders. Isolation of B. mallei can be attempted from discharge/tissue specimens either by bacteriological culture or by intraperitoneal inoculation of a guinea pig (Strauss reaction) (Frothingham, 1901). Alternatively, or preferably additionally, bacterial nucleic acid can be detected by the polymerase chain reaction (PCR) assay (Ulrich et al., 2006) pulse field gel electrophoresis (PFGE), PCR-restriction fragment length polymorphism (RFLP) (Tanpiboonsak et al., 2004) or microarray (Schmoock et al., 2009). Most frequently, a suspect case of glanders is screened serologically for antibodies to B. mallei by CFT,
competitive enzyme-linked immunosorbent assay (cELISA) (Thepthai, 2005) or less frequently, Western blot (Neubauer et al., 2005). A positive result in the CFT may not always be specific for the glanders bacillus; it may represent a cross-reaction with \textit{B. pseudomallei}, the causal agent of melioidosis and a closely related organism. Furthermore, the test is not as sensitive as the mallein test for the diagnosis of glanders.

**Prevention and Control**

Critical to effective prevention and control of glanders is prompt identification, euthanasia and appropriate disposal of all positive cases of the disease (Hunting, 1887; Wittig et al., 2006). Affected premises shall be quarantined and movement controls strictly enforced. Potentially contaminated areas must be disinfected, thoroughly cleaned and re-disinfected. All feed/bedding must be destroyed. Complete eradication can only be achieved through a comprehensive, long-term testing program of all at-risk equids and a rigorously enforced culling program of any additional cases of the disease that might be turned up. While antibiotic treatment of affected animals is resorted to in some areas of the world where glanders is endemic, it is not the preferred option for most countries when dealing with an outbreak of the disease.

**Summary**

There is evidence of resurgence of glanders in some of the countries in which the disease is endemic as reflected in an increased frequency of outbreaks (Paar, 2009). In recent years, glanders has been re-introduced into countries in which it was previously eradicated. Proof of the dissemination of glanders through the international movement of horses has been documented. Disease events during the past five years underscore the need for enhanced vigilance over the potential risk of spread and wider geographic distribution of glanders resulting from continued growth in the volume of international trade in horses.

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International Collating Centre, Interim Report – July 2011 #8 


REPORT OF THE COMMITTEE


Two independent Contagious Equine Metritis (CEM) Importation Program reviews were conducted in 2003 and 2007 at the request of USDA APHIS. The panel of reviewers included state and federal animal health officials, laboratory personnel, researchers and private veterinary practitioners. Each review resulted in the identification of need to improve the program’s efficacy. The reviewers provided specific recommendations to Veterinary Services Management Team which they concluded were needed to reach the program’s intended goal of insuring the U.S. remained CEM Free. The most recent recommendations were provided to the management team in May of 2007. These changes included enhanced regulatory oversight, better data management and establishing a minimal set of standards. The reviewers recommended minimal change to the prescribed testing after concluding the procedures, when properly implemented, would provide the needed opportunity to detect equine animals infected with the CEMO.

On March 15, 2011, USDA APHIS published an interim rule governing the importation and subsequent quarantine and testing of mares and stallions imported from CEM Affected countries. The rule was published as an interim rule citing a recent outbreak and recommendations made by a panel of experts. In contrast to the procedures followed in making a ‘final rule’, Federal Regulations required this interim rule to become effective immediately and disallowed USDA APHIS the opportunity to provide affected entities advanced notice of the included changes. State Animal Health Officials, and other stakeholders, expressed concern to USDA over the rule being published as effective immediately and without consideration of the negative impact these changes would have on stakeholders. Specific concern was caused by the Interim Rule’s inclusion of testing procedures and protocol changes that had not been identified as beneficial by reviewers and when implemented would result in considerable expense. Another concern was omission of procedural aspects the reviewers had identified as needed. In response to the concerns, USDA announced implementation and enforcement of the interim rule would be delayed until July 25 in order to provide industry stakeholders the opportunity to offer public comment. Following the commenting period, and after reviewing the comments received, USDA APHIS announced the scheduled implementation of the interim rule was again being delayed until further notice. The delay is/was to allow time for USDA to give consideration to amending the language regarding the number of required pre-breeding stallion cultures as well as the anatomical sites collected from imported mares and test mares.
BACKGROUND:

Contagious Equine Metritis (CEM) was first diagnosed in Europe in 1977. In 1978, CEM was diagnosed affecting the thoroughbred population in Central Kentucky with the source of infection traced to a stallion imported from Europe. A year later CEM was detected in Missouri.

These outbreaks resulted in USDA implementing by regulation pre-import testing requirements as well as post importation quarantine and testing for adult equidae imported into the United States from countries identified as CEM Affected. Throughout the 1980s and through 1993, the quarantine and testing procedures remained ‘relatively’ unchanged. Both mares and stallions were treated prior to testing by culture. Imported stallions were treated and then bred to two mares with those mares subjected to a series of swabs collected post breeding.

Following an extensive review of the program in 1993, protocols for both mares and stallions were amended. The changes included both mares and stallions be sampled prior to any treatment. The anatomical areas cultured from the mare were also revised to eliminate uterine swabs. Before these changes, imported pregnant mares remained under quarantine throughout their gestation. Today, imported mares can qualify for release from quarantine in as little as 14 days post arrival.

With the changes to the post importation quarantine protocols reducing the length of quarantine and the associated costs, the number and types of importing horses increased significantly. This growing number of imports is demonstrated by data showing that in 1993, 58 thoroughbred and 18 warm blood mares cleared CEM Quarantine in Kentucky. Comparatively, during calendar year 2000, 248 thoroughbred and 196 warm blood mares cleared CEM Quarantine in Kentucky. A similar increase was seen in the number of stallions importing. The accompanying charts (figures 1 and 2) demonstrate the number of mares and stallions importing through Kentucky CEM facilities from 1989 through 2010. The demand for required quarantine space resulted in requests from a number of states seeking USDA’s approval to conduct CEM Quarantines.

Fig 1.
In both the 2003 and 2007, program reviewers concluded that the science used in developing the testing and treatment protocols was sound and when properly implemented does provide a reliable means of identifying infected horses during the quarantine period. A number of reviewers did express concern over the opportunity for insufficient regulatory oversight and improper implementation of the testing procedures resulting from the increase in states and facilities being approved to conduct CEM import quarantines. Recommendations and suggestions on establishing specific minimal standards of oversight, training, and facility requirements were included in the 2007 formal recommendations made to Veterinary Services’ management team. These procedural changes were not included in the interim rule published in March 2011 and do not appear to be included in the planned final rule at this time. It is hoped and anticipated that USDA APHIS plans to incorporate these recommendations via VS Memorandum and/or Policy Directives.

FINAL RULE (Based on Preliminary Information Received)

As of September 2011, the Final CEM Rule has not been published. Changes to the testing protocol anticipated to be included in the Final Rule includes imported mares being subjected to a Complement-Fixation (CEM-CF) test and a single cervical or endometrial swab being included with the third set of cultures. Testing changes for clearing imported stallions are expected to include an additional site to be sampled on stallions prior to breeding, a single cervical or endometrial swab be collected from each test mare both pre- and post breeding, and collection of the post breeding serum sample for complement fixation testing be extended from day 15 to day 21 post breeding.

CONCERNS – Lacking Guidance on Minimal Standards, and Regulatory Oversight

Both the 2003 and 2007 CEM Program reviews resulted in the respective panel of experts concluding the testing procedures and protocols were
REPORT OF THE COMMITTEE

sufficient and would successfully identify infected animals when properly implemented. The reviewers did suggest, and it is believed that USDA is including the changes to the testing procedure described above in the proposed final rule. The reviewers felt the additional testing of imported mares by CF could help identify recently exposed mares prior to investing in three sets of cultures, and including cervical or endometrial swabs might enhance the opportunity to detect infected mares that may have been treated prior to exporting their country of origin.

The reviewers concluded that the ability to identify infected equidae would be grossly compromised if the prescribed testing procedures (to include sample collection, handling, submission, and laboratory testing) were not consistent with or in full compliance with the established protocols. This conclusion appears valid based on our understanding that outbreaks of CEM in this country in 2006 and 2008 were traced to imported horses being incorrectly tested and subsequently released from quarantine without having met the prescribed protocol. The source of infection for a domestic stallion discovered in 2011 remains unknown today. The program review recommendations included required training of individuals (regulatory, veterinary practitioners and laboratory personnel) with responsibility in determining imported horses successfully complete quarantine as prescribed, implementation of a more efficient and effective means of communicating program changes, establishing minimal sets of standards for all aspects of the process, and development of a national data management system to track equidae imported into and completing CEM testing in the United States.

Training: USDA has offered laboratory training as well as applicable training to regulatory officials and private veterinary practitioners. The interim rule (and to our knowledge the final rule), does not ‘require’ mandatory training for approval to conduct CEM Import Quarantines.

Minimal Standards: for facilities and all personnel working in the quarantine facility were detailed in the 2007 recommendations but were not included in the interim or proposed final rule.

Regulatory Oversight: VS’s Area Office and State Animal Health Officials should work together to ensure the level of regulatory oversight of CEM Quarantine Facilities is sufficient and to ensure the procedures and processes are being properly implemented and complied with.

Data Management: This past August USDA APHIS, VS distributed to CEM Coordinators an Excel spreadsheet with instructions to provide detailed information to the VS Regional offices monthly for submission to NCIE. Much of the requested information is USDA generated and not available to state CEM coordinators. Some states have established system of collecting, managing and reporting data associated CEM imported horses. To avoid duplication of data entry, and to assure responsible use of resources, it is hoped USDA will require states to only report the available and pertinent data and allow individual states to report the data via means compatible with their
individual systems. The Kentucky Department of Agriculture has made this request to USDA and at the time of this writing is awaiting a reply.
REPORT OF THE COMMITTEE ON INTERNATIONAL STANDARDS

Chair: Donald Hoenig, ME
Vice Chair: Richard Willer, HI

Joan Arnoldi, WI; Debbie Barr, CAN; Derek Belton, NZL; Corrie Brown, GA; Stan Bruntz, CO; Tony Caver, SC; John Clifford, DC; Matt Cochran, TX; Karen Conyngham, TX; Michael David, MD; Ron DeHaven, IL; Linda Detwiler, NJ; Brian Evans, CAN; John Fischer, GA; Cyril Gay, MD; Paul Gibbs, FL; Robert Ross Graham, VA; David Harlan, MN; Pamela Luisa Ibarra, MEX; Bruce King, UT; Paul Kitching, CAN; Elizabeth Lautner, IA; Randall Levings, IA; Linda Logan, TX; John MacMillian, AR; Bret Marsh, IN; Todd McAloon, MN; Elizabeth Parker, DC; James Roth, IA; Mo Salman, CO; A. David Scarfe, IL; Peter Timoney, KY; Alfonso Torres, NY; Matthew Torres, MD; Arnaldo Vaquer, VA; Jesse Vollmer, ND; Stephen Weber, CO; Annette Whiteford, CA; John Williams, MD; Norman Willis, CAN; George Winegar, MI.

The Committee met on Oct. 3, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 1:00 p.m. to 5:30 p.m. There were 14 members and 25 guests present. Dr. Don Hoenig, the Committee Chair, reviewed charge of the Committee, reiterated that USAHA committees conduct business under Robert’s Rules of Order and told the Committee what constituted a quorum.

Summary of the 79th General Session of the OIE, U. S. Activities
Michael David, USDA-APHIS-VS

Dr. David reviewed the activities of the 79th General Session of the OIE which took place in Paris in May 2011. There are 178 member countries in the OIE as well as 50 international organizations and about 150 countries attended this year’s meeting. There were two technical items on the agenda-the contribution of veterinary activities to global food security for food derived from terrestrial animals; and implementation of a global strategy for FMD control. The OIE Animal Health Information Department presented a summary of the most significant animal health events occurring during 2010 and early 2011. The Web-based system for disease notification — the WAHIS — has facilitated the reporting of animal disease events. All OIE animal health information is available through the OIE database known as the WAHID. Disease events worth noting during this period were as follows: 1) Foot-and-mouth disease (FMD), Type O in China, Mongolia, Japan, and Korea. Continued outbreaks of FMD, particularly in Asia, highlight the continued threat of the disease through cross-border movement of animals and animal products; 2) Highly pathogenic avian influenza (HPAI)-H5N1. The virus is still circulating in Southeast Asia as well as in northern Africa; 3) African swine fever. The continued spread of ASF in Russia is causing concern in Europe. Movement controls of animals and animal products will be critical to containing further spread of the disease; and 4) Problems with
The OIE Scientific Commission grants disease status for four diseases: FMD, CBPP, BSE and rinderpest. Dr. David reviewed the Commission’s official country recognitions for this year for these diseases. The Commission is considering the following additional diseases for disease status recognition: African Horse Sickness, Classical Swine Fever (CSF) and Newcastle Disease. He also briefly reviewed the activities of the Aquatic Animal Health Commission and the Biological Standards Commission.

The Terrestrial Animal Health Commission (or “Code Commission”) was also busy at this year’s meeting updating chapters on the glossary, criteria for listing diseases, FMD, Vesicular Stomatitis, and the chapters on equine diseases, Newcastle Disease and CSF. Other topics considered by the Code Commission included: laboratory research/animal welfare, stray dog control, broiler production (presented, not adopted) and beef production scheduled to be reviewed in 2012. Dairy production may be the next sector under consideration.

The Committee was pleased to hear from Dr. David that the new Presidente for the Region of the Americas is our own Dr. John Clifford. Dr. David reported that Veterinary Services has had stakeholder meetings with the Animal Agriculture Alliance, NCBA, NPB, NPPC, the NCC and the NTF in the past year as well as other government agencies such as FAS, FSIS, FDA and ARS. He also reported on other OIE-related activities including: disease reporting to the OIE, the twinning project with China Animal Health, vector surveillance methodologies, a draft paper for FMD control, veterinary biologics and several projects being held in conjunction with the National Veterinary Services Laboratory (NVSL). He reported on two newly approved Collaborating Centers for Veterinary Drug Regulatory Programs (FDA) and Research and Diagnosis of Emerging and Existing Pathogens of Wildlife (USGS/NWHC).

The Regional Commission of the Americas meeting was held in Montevideo Uruguay from Nov. 16-19, 2010 and Drs. David and Clifford attended with Dr. Clifford presiding. The Regional Commission Board meetings are held in Buenos Aires in March and November.

Dr. John Clifford then came to the podium and reported that the U.S.’s dossier to the Code Commission for a change in BSE status to negligible risk was rejected two years ago. The U.S. will be bringing forward a request to address the issue of differentiating infected from vaccinated animals (DIVA) vaccines to be used in the control of FMD and will also be pushing for greater unity among countries in the Region of the Americas.

**Farm Animal Welfare- International Guidelines**
Gary Egrie, USDA-APHIS-Veterinary Services

Dr. Egrie reported that since 2001, animal welfare has been included in the Terrestrial Animal Health Code as well as the Aquatic Animal Health Code of the OIE. Their purpose is to assure uniform implementation of the guidelines among member nations and the chapters focus primarily on the
welfare of animals during transportation, the slaughter of animals and the use of animals for research and education. He related that the OIE Region of Asia, the Far East and Oceana have developed a regional animal welfare strategy. The Region of the Americas is also contemplating developing an animal welfare strategy.

**Update on the OIE Biological Standards Commission**

Bev Schmitt, Director, Diagnostic Virology Lab, National Veterinary Services Laboratory (NVSL), USDA

The Biological Standards Commission for OIE is chaired by Dr. Vincenzo Caporale from Italy and Dr. Schmitt is the vice chair. The four other individuals on the Commission are Drs. Medhi El Harrak (Morocco), Hualan Chen (China), Alejandro Schudel (Argentina) and Paul Townsend (UK). The Commission itself meets formally in Paris but also has several other *ad hoc* groups. Dr. Schmitt reported on the laboratory twinning project that the Commission has had for a number of years to assist other member countries in upgrading their diagnostic laboratories. She also reported on the changes to the OIE Reference Center rules which call for only one OIE reference lab for the same disease in the same country and only one OIE Collaborating Center for the same specialty in each OIE region/sub-region. For the Collaborating Centers, there are currently 13 specialties identified but more can be considered. There is one new reference lab in the U.S. (NVSL) for swine influenza and NVSL is pending approval for FMD.

A Manual of Standards will be published sometime late in 2012.

With respect to laboratory twinning, there are currently three projects complete, 29 underway and six approved and due to start. The U.S. has completed a project with Brazil on avian influenza and Newcastle disease.

**Update from the Food and Agriculture Organization (FAO) - Capacity Building in the FAO and OIE, One Health and USAHA/FAO Collaboration**

Juan Lubroth, Chief Veterinary Officer, FAO, Rome, Italy

Dr. Lubroth began by reviewing the eight millennium development goals of the United Nations, stating that the FAO focuses on livelihood and food security, with animal health being essential to both. The FAO has 40 veterinarians working at its headquarters in Rome. The FAO participates in OIE work groups and generally, Dr. Lubroth stated, the OIE and FAO are in agreement on the vast majority of topics. For safe food, we need sound policies and effective governance; it’s not all about technology, Dr. Lubroth stated. He asked how we will feed the world’s megacities in the coming decades and offered the view that there are important roles for veterinarians in this endeavor as well is in implementing the eight millennium development goals. He showed a slide of a family in Germany and its weekly budget for food (more than $500) versus a family in Chad ($1.23) emphasizing the immense differences in living conditions and consumption patterns.
He discussed FMD eradication and control and put forth the idea of "progressive" control which envisions a continuum on the path to eradication from stage 0 (FMD risk not controlled, no reliable information) to stage 5 (maintain 0 circulations and incursions, withdraw vaccination). OIE has endorsed this concept. FMD elimination/eradication does not mean the expansion of land for livestock production. Rather there needs to be responsible use of natural resources and more efficient production systems. There are 110-120 countries with FMD.

With respect to FAO and One Health, Dr. Lubroth commented on the fragility of human health and animal health as well as ecosystem health and how intertwined they are. He also talked about the Global Early Warning and Response System for major animal diseases including zoonoses (glews@glews.net). He mentioned the importance of tackling disease at the source. He showed an impressive map of the more than 40,000 container ships that are in the oceans at any one time. He showed the FAO approach to zoonotic diseases categorizing them as: neglected/endemic, emerging or food borne.

Dr. Lubroth went on to discuss the Farmer Field Schools (FSS) whose objectives are empowering farmers with knowledge and skills; improving their ability to make critical and informed decisions; injecting new ways of thinking and problem-solving; and enhancing relationships. These were first developed by the FAO in 1989 to train rice farmers in integrated pest management and have been expanded to other countries in Asia, Africa, the Middle East and Latin America. There are over 2500 FSS in Kenya alone. The concept has also been expanded to Livestock Field Schools and Climate Field Schools emphasizing the principle of learn by doing. ("If I hear it, I forget it. When I see it, I remember. When I do it, I own it for life.")

Dr. Lubroth ended by discussing the H5N1 avian influenza events of the past seven years.

In the Q&A, we discussed several possibilities for fostering further collaboration and cooperation between FAO and USAHA and agreed to continue the dialog.

CAFTA-DR: Animal Health and Trade Opportunities in Central America and the Caribbean
Arnaldo Vaquer, Vaquer, Inc.

Dr. Vaquer gave the Committee an update from last year's presentation on his work on the Central American Free Trade Agreement-Dominican Republic and talked about trade opportunities with Central America and Mexico for poultry meat, pork, beef, bovine semen and bovine embryos, talking about the obstacles related to animal health and processing/equivalence standards.
Update on the North American Animal Health Laboratory Network (NAHLN)
Beth Lautner, Director, National Veterinary Services Laboratory (NVSL), USDA

Dr. Lautner reviewed the history of the creation of the NAHLN, the inception of which was at the USAHA meeting in 2004 and followed by further discussion at the 2006 annual meeting. Representatives of the three countries met in Winnipeg in February 2007 to discuss the terms of cooperation and a roadmap towards harmonization of the diagnostic tests used in North America. Initial harmonization concentrated on three diseases: vesicular diseases, avian influenza and bovine tuberculosis. Working groups were established. An expanded focus was developed on 2011 by the CVOs of the three countries to include Newcastle disease and classical swine fever and to develop a reference standard for Mycobacterium bovis and M. avium tuberculins. Diagnostic tests are now considered harmonized for FMD in the three countries for rRT-PCR, antigen ELISA, virus neutralization and virus isolation. Diagnostic tests for CSF are also considered harmonized for virus isolation and IDEXX antibody ELISA and for avian influenza, diagnostic tests are considered harmonized for hemagglutination inhibition, rRT-PCR matrix and agar gel immunodiffusion. For bovine TB, diagnostic efforts for harmonization are underway for histopathology, tuberculin skin test, bacterial culture and identification and bovine gamma interferon assay. Tests are considered harmonized for TB in all three countries for histopathology and for the tuberculin skin test. Dr. Lautner acknowledged Dr. Rick Willer and former USAHA President Bob Frost for their efforts in this project.

OIE Veterinary Legislation Support Program (VLSP) and Performance of Veterinary Services (PVS)
Dorothy Geale, Senior Staff Veterinarian, Canadian Food Inspection Agency

Dr. Geale related that the VLSP is designed for the improvement of veterinary legislation for veterinary governance in participating countries. It provides methodological advice only and requires country ownership and drafting. She told about the various types of laws in the world including common law, civil law, Muslim law, and customary law. Veterinary legislation is the basis for competent authorities to meet their obligations as defined in the Code and relevant recommendations of the Codex Alimentarius. She also reviewed categories of legislation as they relate to the food chain, animal health, zoonoses, welfare, waste products, veterinary medicines and biologicals and veterinary and para-veterinary professions. OIE veterinary legislative missions generally last one week and follow the PVS mission. The objective is to clarify the situation in the country and analyze its needs relative to veterinary legislation. Requests for the VSHP have been received by 33 countries and completed in 21. Eighteen experts have been selected from every region of the OIE to conduct the missions.
World Veterinary Year and the OIE ad hoc Group on Veterinary Education
Ron DeHaven, Chief Executive Officer, American Veterinary Medical Association (AVMA)

The OIE ad hoc Group on Veterinary Education was formed following the OIE Global Conference on Veterinary Education held in October 2009. Dr Dehaven is the chair of the group which includes representatives of all five OIE regions. The task is to define day 1 core competencies that new veterinary graduates need to fulfill National Veterinary Services tasks as defined by the OIE. The charge is in not to define accreditation tasks or to prescribe a specific curriculum. All veterinarians are responsible for promoting animal health and welfare and veterinary public health. There are general competencies including basic veterinary services, clinical veterinary sciences, animal production, food hygiene and safety and animal welfare. Specific and advanced competencies have also been defined by the group the next steps will be a January 2012 meeting in Paris followed by potential adoption of minimum competencies by the OIE General Assembly in Paris in May 2012.

Dr. Dehaven reported on the progress of the World Veterinary Year which he had told the Committee about at last year's meeting in Minneapolis. The events have been commemorating the 250 anniversary of the first veterinary school which was opened in Lyon, France, in 1761. There are 58 national committees, 1,391 corresponding members and 12 business partners. The opening ceremony was held in Versailles in January and the closing ceremony will be held in Cape Town, South Africa later in October. A few highlights of the year have been Congressional resolutions, an AMA resolution, student exchanges, and exhibit booth and an exhibit at the National Library of Medicine in Washington, DC. The AVMA Journal has also been publishing a Legends in Veterinary Medicine once a month this year.

Committee Business
There were no subcommittee reports or time-specific papers.

The Committee unanimously passed a resolution on concerning harmonization of electronic certificates of veterinary inspection between the U.S and Canada. This resolution was offered to the Committee by the Committee on Animal Emergency Management.
REPORT OF THE COMMITTEE ON JOHNE’S DISEASE

Chair: Elisabeth Patton, WI
Vice Chair: Randy Wheeler, IA

John Adams, VA; J. Bruce Addison, MO; Paul Anderson, MN; Robert Angus, ID; Joe Baker, NM; Marilyn Balmer, MD; Joy Bennett, NY; Richard Breitmeyer, CA; Charles Brown, IL, WI; Todd Byrem, MI; James Carroll, MO; Michael Collins, WI; Thomas Conner, OH; Stephen Crawford, NH; Ned Cunningham, OH; Ria de Grassi, CA; Anita Edmondson, CA; Robert Ehlenfeldt, WI; John Enck, PA; William Fales, MO; Kathy Finnerty, NY; Keith Forbes, NV; Geoffrey Fosgate, ZAF; Robert Gerlach, AK; William Hare, MD; Beth Harris, IA; William Hartmann, MN; Linda Hickam, MO; Donald Hoenig, ME; Sam Holland, SD; Ernest Hovingh, PA; David Hunter, MT; Carla Huston, MS; Jamie Jonker, VA; Karen Jordan, NC; Susan Keller, ND; John Lawrence, ME; Donald Lein, NY; Tsang Long Lin, IN; Mary Lis, CT; Laurent O’Gene Lollis, FL; Beth Mamer, ID; Chuck Massengill, MO; Chris Murdock, MO; Jeffrey Nelson, IA; Dustin Oedekoven, SD; Kenneth Olson, IL; Lanny Pace, MS; Elizabeth Parker, DC; Boyd Parr, SC; Janet Payeur, IA; Kristine Petrini, MN; Jewell Plumley, WV; Sebastian Reist, NJ; Suelee Robbe-Austerman, IA; Paul Rodgers, WV; Allen Roussel, Jr., TX; Patricia Scharko, SC; Andy Schwartz, TX; William Shulaw, OH; Marilyn Simunich, ID; Shri Singh, KY; Judy Stabel, IA; Scott Stuart, CO; Robert M. Temple, OH; Charles Thoen, IA; Brad Thurston, IN; Jesse Vollmer, ND; James Watson, MS; Gary Weber, MD; Scott Wells, MN; Diana Whipple, IA; Robert Whitlock, PA; George Winegar, MI; Ching-Ching Wu, IN.

The Committee met on Oct. 2, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 12:30-5:00 p.m. There were 39 members and 15 guests present.

USDA-APHIS Report Johne’s Disease Program Updates for FY 2011

Michael Carter, USDA-APHIS-VS

In FY 2011, as of August 25, State reported activities included 105,042 cattle tested by serum ELISA, 64,792 cattle tested by milk ELISA, and 11,530 cattle tested by fecal culture or PCR. There were 4,145 enrolled herds (3,418 dairy and 727 beef) of which 322 are test negative herds (196 dairy and 126 beef). Herds enrolled as test negative herds are progressing through to level 4. There are 84 Johne’s program level 1 (52 dairy and 32 beef), 102 Johne’s program level 2 (57 dairy and 45 beef), 23 Johne’s program level 3 (9 dairy and 14 beef), and 113 Johne’s program level 4 herds (78 dairy and 35 beef). This represents an overall continuing decline in most categories.
In FY 2011 USDA-APHIS-VS received $3.4 million for Johne’s disease activities. This continued reduction in federal funding has resulted in a change in focus for the program. Current VS Johne’s disease program objectives include: 1) maintaining the uniform program standards for the Voluntary Bovine Johne’s Disease Control Program; 2) conducting laboratory approvals through the National Veterinary Services Laboratories; 3) vaccine and test kit approval and monitoring through the Center for Veterinary Biologics; and 4) supporting educational and outreach activities.

National Johne’s Working Group (NJWG) Report
Jamie Jonker, National Milk Producers Federation, and Chair.
This report is included at the end of this Committee Report.

JDIP Education Update - Multistate Initiative
Ken Olson, Johne’s Disease Integrated Program (JDIP)
JDIP Outreach activities, future plans and preliminary results of a survey on state activities were highlighted. JDIP held its 2011 annual conference in conjunction with the Joint Annual Meeting (JAM) of the American Dairy Science Association and the American Society of Animal Science. This was the second time this has been done. The JAM provides JDIP with greater visibility and assures that the 23 abstracts presented in oral and poster sessions will have international distribution. They are also available on www.jdip.org. During the past year JDIP also used displays to reach audiences at the JAM, AABP and USAHA meetings. Trade media contacts were made at World Dairy Expo and collaborators assisted in distributing information to attendees. Three educational modules on milk ELISA (Basics, Field and Lab Technicians) were recently released in collaboration with National DHIA and the vet school at the University of Wisconsin. Funding is being sought to complete another module for on-farm risk assessments. JDIP representatives visited congressional staff in September to voice support for agricultural research funding and share information on JDIP as an example of the effective use of funds as well as the need for on-going funding. It was noted that JDIP is in its final year of funding under the existing USDA-NIFA CAP grant. Plans are underway, and support was requested, for establishment of a multi-state initiative on mycobacterial diseases (Johne’s and bovine TB) that could at a minimum help maintain the existing JDIP research and outreach network. Preliminary results were presented on a survey of state designated Johne’s coordinators (DJC) relative to current state programs. Funding cuts are having a major impact in many reporting states with several indicating the program was basically on hold. On the positive side, five states reported receiving state funds that help support program activities and milk ELISA use through DHIA continues to increase. A final note was the need for greater dialogue between state officials; industry and academia on ways to move forward even with reduced funding.
National Johne’s Disease Education Initiative
Teres Lambert, National Institute for Animal Agriculture (NIAA)

The National Johne’s Disease Education Initiative continues to directly and indirectly help educate producers about Johne’s disease. The following tactics were carried out between April and September 2011:

• Researched, wrote and disseminated spring and summer issues of the dairy and beef e-newsletters. [One national copy of each issue is disseminated to targeted national audiences, including breed associations and cooperatives, and is posted on the NJEI website and 50 state-customized copies are sent to respective state Daily Journal of Commerce (DJC) contact for dissemination within states and posted on state websites.]

• Updated Short Guidelines for Dairy and for Beef and included these with the summer newsletters. Updated and redesigned “How to do Risk Assessments and Develop Management Plans for Johne’s Disease” to reflect revised Voluntary Bovine Johne’s Disease Control Program.

• Rewrote Handbook for Veterinarians and Beef Producers and the Handbook for Veterinarians and Dairy producers, reflecting changes to the updated Voluntary Bovine Johne’s Disease Control Program. Designed Handbook to increase eye appeal and readability. (Major project involving Dr. Patton, Dr. May, Dr. Wheeler and USDA-APHIS-VS, with nine versions before approved.)

• Reprinted dairy version of Johne’s prevention/control brochures and the sheep Q&A booklets.

• Attended Agricultural Media Summit and interacted with media to encourage increased visibility about Johne’s disease. Excellent response from media.

• Updated National Johne’s Disease Education Initiative logo to reflect inclusion of “Disease” in the name. Adjusted all items that carry this logo: PowerPoint template, newsletter templates, letterhead, etc.

• Maintained and updated the Johne’s Education website: www.johnesdisease.org. Website is averaging 63 different visitors per day, going to an average of seven pages per visit.

USDA-APHIS-VS-NVSL Serum and Milk Check Test Results
Jeff Nelson, USDA-APHIS-VS-NVSL

In 2011, 84 laboratories (11 international and 73 USA laboratories) took the Johne’s disease serologic proficiency test and 48 laboratories took the Johne’s disease milk ELISA proficiency test. This year NVSL approved 35 labs to perform the Prionics ELISA and 49 labs to perform the IDEXX ELISA for serum testing. NVSL also approved 48 labs to perform the milk ELISA. It was noticed that there was a decrease in the number of individuals that are approved to perform the Prionics serologic ELISA, 41 in 2011 vs. 52 in 2010.
JOHNE’S DISEASE

We saw a slight decrease in the number of labs approved for the milk ELISA in 2011 compared to 2010, 48 vs. 50.

USDA-APHIS-VS-NVSL Fecal Check Test Results
Suelee Robb-Austerman, USDA-APHIS-VS-NVSL

In 2011, 62 laboratories (6 Canadian, 3 European Union, 1 New Zealand and 52 USA laboratories) took the Johne’s disease fecal proficiency test, similar to 2010 number of 61. This year, we approved 48 labs for direct PCR, compared to 50 in 2010. Twenty-nine laboratories were approved for liquid media, unchanged from 2010. We saw a slight decrease in the number of labs approved for solid media, 21 vs. 23. We continue to see an increase in the number of labs that take and pass the pooling assay, 62 in 2011 vs. 52 in 2010. False positive results with direct and confirmatory PCR continue to be the major cause of inaccuracy and failure.

National Demonstration Herd Project Update
Charles Fossler, USDA-APHIS-VS-CEAH

The National Johne’s Demonstration Herd Project (NJDDHP) in the United States was initiated to evaluate the long-term feasibility and effectiveness of management-related practices designed to control Johne’s disease on dairy and beef cattle operations. The NJDDHP was started in 2003, but final herd enrollment numbers were not reached until 2005. Participation required a risk assessment and herd testing to be completed for each herd on an annual basis. Data collection for all herds ended in September 2010. Analysis on the final data is ongoing at the Centers for Epidemiology and Animal Health and at four universities. At least five years of test results were collected from 58 dairy herds and 19 beef herds at the conclusion of the project. Results to date indicate that, for both beef and dairy herds, prevalence of Mycobacterium avium subspecies paratuberculosis (MAP) in the third through seventh years of participation was significantly lower than prevalence during the first year of participation. Analysis on the final data set using Poisson regression was undertaken to identify areas from the risk assessment most important with regard to MAP prevalence in dairy herds. This analysis showed that high risk scores for feeding pooled colostrum to calves, possible manure contamination of milk or colostrum, and additions obtained from non-tested herds were associated with a greater risk for cattle to be MAP-positive. These results suggest that management efforts initiated since the beginning of the project have been effective in reducing MAP prevalence. Results also suggest that avoiding the feeding of pooled colostrum, avoiding manure contamination of milk or colostrum fed to calves, and obtaining additions from herds known to be test-negative should receive primary consideration with regard to control of Johne’s disease on dairy operations.
JDIP Diagnostics and Vaccination Update
Scott Wells, University of Minnesota

JDIP Community-Based Test Evaluation Project

Comparing diagnostic tests for Johne’s disease has always been challenging. JDIP is working to address the challenges that exist on two fronts. The initial effort focused on developing a modified version of the Standards for Reporting of Diagnostic Accuracy (STARD) that is relevant to paratuberculosis (Johne’s disease) in ruminants. The new guidelines, called STRADAS-para TB, (Standards for Reporting of Animal Diagnostic Accuracy Studies for paratuberculosis) were published in the August issue of the journal Preventive Veterinary Medicine (volume 101:18-34).

The second portion of the project is now underway under the direction of Ray Sweeney (U of Penn) and Murray Hines (U of GA, Tifton Diagnostic Lab) and will include a “head-to-head” comparison of diagnostic tests. Goals of the project are to: 1) create a repository of well-characterized samples for use in the studies of Johne’s disease diagnostic test accuracy; and 2) use samples collected to create the repository to compare performance of multiple diagnostic tests for paratuberculosis in dairy herds. Holstein herds participating in Dairy Herd Improvement Association (DHIA) system and not using paratuberculosis vaccine are eligible for inclusion in the study. Eligible animals in these herds will be those in lactation 2 and greater, and lactating at the time of sample (milk, feces and serum) collection. Infected and non-infected herds will be included in the study.

Once all the samples have been banked in the repository, test sets will be sent to the four laboratories that are participating in the head-to-head comparison of tests:

- Antel BioSystems – Serum ELISA and milk ELISA
- Cornell Animal Health Diagnostic Center – TREK and qualitative PCR
- Johne’s Research Laboratory (U of Penn) - HEYM and Tetracore PCR
- Johne’s Testing Center (UW-Madison) – MGIT

Results will be available in 2012. Samples in the repository will be available for future use by other researchers.

The APHIS-Johne’s Disease Integrated Program (JDIP) Vaccine Project

There is a strong interest among many producers and veterinarians in having a more effective vaccine available to help combat Johne’s disease. The JDIP Vaccine Project, sponsored in part by USDA APHIS VS, was established to help in this effort. The objective of the project is to gather candidates showing vaccine potential and submit each to a consistent, rigorous, three phase screening process designed to identify those with the greatest potential for commercial development. The first two phases are now complete. Of the eighteen knockout mutants submitted, eight were identified as having the best attenuation in the macrophage portion of study and were moved into Phase II, the mouse trial. The five mutants showing the best protection from challenge have now been moved forward into the final phase of the vaccine project, Phase III, the goat model. Phase III is being conducted in the lab of Dr. Murray Hines II at the University of Georgia.
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total of 80 goat kids are being used on the five test and three control groups. Results of this work will be available next fall. Additional information about the project is available on the JDIP web-site (www.jdip.org).

Dairy Herd Information Association (DHIA) QC Certification efforts
Jay Mattison, National DHIA

Jay Mattison reported on Dairy Herd Information Association quality control efforts in DHI laboratories performing Johne’s milk ELISA testing.

Committee Business

Committee reviewed the mission statement; motion passed by unanimous vote to maintain mission statement as written.

A motion was made and passed by unanimous vote to combine Johne’s Committee and National Johne’s Working Group (NJWG) meetings into one meeting on Sunday afternoons for future USAHA meetings.
Scott Wells presented a review of the National Johne’s Strategic Plan that was adopted in 2008. Mike Carter presented an update on the USDA program and future funding plans. Ken Olson reported on States activities with Johne’s disease. Karen Jordan presented a summary from meetings with the key Congressional and Executive Branch representatives on Johne’s disease. David Kelton gave an overview of the Canadian Johne’s disease Control program. Jason Lombard discussed needs for the National Animal Health Monitoring Systems (NAHMS) 2014 Dairy Studies via conference call. Derek Belton gave an update on the New Zealand Johne’s disease program. Ken Olson updated the group on Dairy Herd Improvement Association (DHIA) initiatives with Johne’s disease. The meeting closed with a group discussion on next steps in how to move the program forward with reduced funding for the program.
REPORT OF THE COMMITTEE ON LIVESTOCK IDENTIFICATION

Chair: Tony Forshey, OH
Vice Chair: Kevin Maher, IA

The Committee met on Oct. 4, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 8:00-10:50 a.m. There were 25 members and 75 guests present.

The Committee remembered Dr. David Morris of Colorado, who passed earlier in 2011.
Animal Disease Traceability - Remarks on the Animal Disease Traceability Proposed Rule

Neil Hammerschmidt, USDA-APHIS-VS

APHIS published the proposed rule on traceability for livestock moving interstate on August 11, 2011 and the comment period has been extended an additional 30 days to December 9. The rule proposes, with some exceptions, that all livestock moved interstate must be officially identified and accompanied with an Interstate Certificate of Veterinary Inspection (ICVI) or other documentation. This is the first time ICVIs are mentioned in a federal regulation, with the intent to give authority to enforce compliance.

The proposed rule addresses several species; captive cervids, cattle and bison, equines, poultry, sheep and goats and swine. For the most part, there will be no changes for species that currently have requirements — such sheep and goats, captive cervids, equine, poultry, and swine. However, the proposed rule would provide additional requirements in the cattle sector for interstate movements to help improve traceability. Therefore, our report today reviews the proposed requirements for cattle and bison.

The regulation would, for official ID, include all ages and classes of cattle. Cattle under 18 months of age, or the feeder/stocker cattle, would be phased in. In the initial phase, official ID would be required for:

- Cattle and bison 18 months or older
- Dairy cattle (any age)
- Cattle and bison (any age) for:
  - Rodeo/recreational events
  - Shows or exhibitions

Beef cattle under 18 months (feeder/stocker cattle) would be exempt during the initial phase.

We plan to expand the official ID requirements to feeder/stocker cattle only when the initial phase of the traceability regulation has been successfully implemented. Therefore, we plan to assess the workability of the requirements for cattle in the initial phase. When we are ready to start the assessment, we will publish a notice in the Federal Register describing the assessment procedures. The assessment will involve an advisory group with industry representation from sectors most affected by the official ID requirements. The advisory group will let us know the effectiveness of the various elements of the initial phase of identifying cattle. It will also make recommendations regarding application of the official ID requirements to feeder cattle. As part of the phase-in, we will also propose delaying the official ID requirements for feeder cattle until at least 70 percent of all cattle initially required to be officially identified are in compliance. While higher rates of compliance are ultimately expected and necessary, the 70 percent figure would represent a significant increase in the use of official eartags on adult cattle, indicating that effective tagging practices are in place.

We will publish the results of the assessment through a second Federal Register notice seeking public comments. APHIS will consider the advisory
report and all feedback from the public regarding the official ID of feeder cattle.

If we decide to implement the final phase, we will publish a third notice on the implementation of official ID for feeder cattle discussing the comments and announcing the effective date of these official ID requirements. We expect to do this 1 year after the third notice is published.

Compliance with the regulation will be critical. APHIS Veterinary Services will assemble a working group with State and Federal resources to develop guidelines for monitoring and enforcing these new requirements as well as existing ones. This plan, we believe, will ensure we have various options and defined practices that can be administered cost effectively while achieving a high level of compliance with the regulations that affect traceability. Likewise, we have made collection of ID at slaughter a priority. We plan to establish a memorandum of understanding with the Food Safety and Inspection Service to ensure we have support and understanding to oversee these processes, so we can work collaboratively. Most importantly, we want to ensure that the collection of ID at slaughter is properly achieved.

Q&A topics were responded to by John Clifford and Neil Hammerschmidt, regarding the following questions: final rule timing, back tags, dairy steer ID, state’s role in ID requirements, minor species questions, replacement of official ID tag, ICVIs, state and fed cooperation, enforcement of removal of ID, etc.

Discussion and Update on USDA Secretary’s Advisory Committee on Animal Health (SACAH)
Boyd Parr, South Carolina State Veterinarian and Don Hoenig, Maine State Veterinarian

Drs. Parr and Hoenig provided an update of Committee structure, members, and method of communication and also reviewed major comments that have been received.

The purpose of the Committee is to advise the Secretary on strategies, policies, and programs that prevent, control, or eradicate diseases of national significance, and lead the dialogue on public health concerns, conservation of natural resources, and the stability of livestock economies. In addition, to engage the public in dialogue on topics such as livestock disease management, and traceability strategies as well as prioritizing animal health issues.

Major areas of traceability interest:
- Role of brands
- Avoidance of an unfunded mandate scenario
- Inclusion of feeder cattle
- Security and confidentiality of information collected
- Extension of the comment period for the proposed rule
- Maintaining the speed of commerce
• Technology for both identification devices and certificates of veterinary inspection
• Tribal sovereignty
• Statement of objectives of the framework and the problems it is intended to address

Avoidance of an unfunded mandate scenario:
Issue: Information technology, data management, tags, and other performance requirements could impose costs that would burden stakeholders.

Committee Recommendation: The proposed rule should incorporate concrete provisions to ensure it will not result in an unfunded mandate. The proposed rule should provide that the regulatory requirements will be suspended if, at any point, there is insufficient funding, specifically for the costs to producers for identification devices; costs to States for necessary personnel and technology; and the costs to other impacted individuals (such as veterinarians, sales facilities, and other market facilitators) for any mandated practices and technology.

Issue: Inclusion of feeder cattle in the proposed rule.
Committee Action: The Committee voted during its March 4, 2011, teleconference with 13 of 17 on the call in favor of a framework that requires phase-in inclusion of feeder cattle.

This is an ongoing Committee to address the issues.

Veterinary Inspection Documentation Study
Susan Keller, North Dakota State Veterinarian

Identification of animal evaluation study demonstrated various examples of ID, including orange metal tags, bangle tags, etc., and associated with other tags. DNA testing and confirmation exercise of animal ID.

Example of kill order and lack of ID completeness. Accredited vets have range of accuracy of animal ID entry on official forms. Brucellosis vaccination and/or state ID tags on health certificates would have helped ND with traceback- and showed examples of vets recording partial/incomplete lists of tags.

Owner affidavit is a tool, but not a preferred method of traceback. Reading brands at slaughter is very challenging. She showed an example of a Certificate of Veterinary Inspection (CVI) at an auction market where animals were sold and bought back by the same owner so animals avoid TB and brucellosis testing and other examples of lack of and incomplete IDs on CVIs. Another trace indicated that animals were from a state auction market, but the state import clerk noticed animals were from five states, and shipment was then rejected.

TB test chart example indicated smudged numbers, and illegible identification. Suggests electronic recording of numbers for improved compliance.
Evaluation of Interstate Certificate of Veterinary Inspection (ICVIs) to Support Animal Disease Tracing
Ryan Smith, USDA-APHIS-VS CEAH
Co-Authors: Katie A. Portacci, Michael Buhnerkempe, Lauren Abrahamsen, Philip Riggs, Colleen T. Webb, Agricola Odoi

The Interstate Certificate of Veterinary Inspection (ICVI) is one of the foundations of the National Animal Disease Traceability System. When filled out completely, an ICVI can enhance a State's ability to rapidly trace an animal's origin and destination location, improving animal disease traceability. We evaluated ICVI paper records for cattle issued in 2009 for the quality and content of information. To evaluate the paper ICVIs for each state a statistically significant sampling methodology was developed for each State. Sixteen data elements on the paper forms—important for accurate tracing of animals—were evaluated and classified as present, illegible, or blank based on the completeness of information provided by the accredited veterinarian on the ICVI.

Nationally, it is estimated that 195,050 paper ICVIs are completed annually. We evaluated 7,630 randomly sampled paper ICVIs. The National average for complete shipment origin address was 59.8%, which ranged from 21.2% to 100.0% by State. Shipment destination address was lower with a National average of 50.7% ranging from 10.0% to 91.7% by State. Shipment, examination and issue date were present on 43.4% of ICVIs and varied from 0.0% to 100.0% by State. Official animal identification was present on 25.1% of ICVIs and ranged from 0.0% to 85.0% by State. For all sixteen data elements evaluated the reason for incomplete information was blank (63.0%), illegible (0.7%), data element not collected (33.2%), and not useable (3.0%). Reports detailing the specifics for each State have been provided to the AVICs and are intended to help States gauge the quality of information provided by accredited veterinarians and focus efforts as States strive to meet the new traceability performance standards.

Global Animal Management, Iris Scan - “eyeD™”
Michael Coe, Global Animal Management

Introduction to eyeD™

eyeD™ is a non-invasive, intelligent equine identification system. eyeD utilizes equine iris patterns as the foundation for unique identification. Three basic components of the system include the eyeD™ Camera, eyeSync™ client software, and the eyeD processor.

The enrollment process utilizes a 640 x 480 monochrome video image to analyze the iris patterns. An algorithm is used to create an eyePrint™ to describe the patterns. The eyePrint is sent to the eyeD processor where a 15 digit alpha-numeric unique identifier to be issued. The verification process utilizes a 640 x 480 monochrome video image to analyze the iris patterns, match the code to all eyePrints stored in the eyeD processor and authenticates or rejects individual.
The iris is measurable with great precision via feature extraction & quantification for height, width, spatial relationship. It is stable for life and naturally protected and visible without intrusion and imaging can be accomplished from a distance. No two irises are alike, even clones have different iris patterns making an eyeD eyePrint more accurate than a fingerprint.

Three Simple Steps:
1. A digital photo is taken of each of the horse’s eyes using a special camera.
2. The images are then automatically converted into a unique eyePrint; one for each eye.
3. The eyePrints are electronically stored in the eyeD processor along with other optional information and records. When verification is necessary, a photo is taken of either eye and the resulting eyePrint is then matched to those that have been stored with the eyeD processor.


Committee Business
Last year’s Committee resolutions were reviewed. There was no further old or new business, with no resolutions presented.
The Committee met on Oct. 2, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 12:00 to 3:00 p.m. There were 16 members and 25 guests present.

Legislative Activities
Brad Mollet and Jonathen Orloft – Capitol Partners

Capitol Partners, a Washington, DC lobbying firm hired by AAVLD, gave a presentation outlining activities conducted to secure funding for the NAHLN. They were successful in spearheading a floor amendment to reinstate $4.4 million to the Food Animal Defense Initiative (FADI) line item within the U.S. House Agriculture Committee Budget. The goal now is to pursue a strategy to secure $30 million annually to support the NAHLN infrastructure and enhancement. One option discussed was the possibility of requesting support from the Secretary of Agriculture and pursuing inclusion in the 2012 Farm Bill.

Action items:
1. Capitol Partners will develop a timeline for moving the process forward.
2. AAVLD will conduct a survey of NAHLN labs to determine operating costs and state contributions (excluding any federal funding) in support of the $30 million funding request. The goal is to provide a funding breakdown to Capitol Partners by November.

NAHLN Structure Proposal
Gary Anderson, Kansas State University

Dr. Anderson presented “A Vision for the National Animal Health Laboratory Network Structure.” This document is a proposal from the
NAHLN Coordinating Council outlining the future structure of the NAHLN. The overall plan was well-received by the members of the Joint NAHLN Committee. Most of the discussion revolved around potential funding considerations. Dr. Barb Powers presented a draft $30 million budget delineating the funding necessary to meet the requirements for each laboratory level suggested in the proposed network structure. The draft budget will be reviewed by the AAVLD Executive Committee and then distributed to the Joint NAHLN Committee and NAHLN Coordinating Council and then to Capitol Partners, by November 1, to use as background information in lobbying efforts.

Committee Business

A Resolution on NAHLN Funding from the Committee on Animal Emergency Management was presented to the Committee for consideration. After significant modification, Dr. Tom McKenna moved for adoption of the resolution. The motion was seconded by Dr. Lanny Pace. The motion passed by voice vote.
COMMITTEE ON NOMINATIONS AND RESOLUTIONS

Chair: Richard Breitmeyer, CA

J Lee Alley, AL;  Bill Barton, ID;  Philip Bradshaw, IL;  Jones Bryan, SC; Clarence Campbell, FL;  Joe Finley, TX;  Kristin Haas, VT;  Thomas Hagerty, MN;  Bob Hillman, ID;  Donald Hoenig, ME;  Maxwell Lea, Jr., LA;  James Leafstedt, SD;  Donald Lein, NY;  Bret Marsh, IN;  Michael Marshall, UT; Richard McCapes, CA;  Dustin Oedekoven, SD;  John Ragan, MD;  Glenn Rea, OR;  John Shook, PA;  Brian Smith, DC;  H. Wesley Towers, DE;  Max Van Buskirk, PA;  James Watson, MS;  Richard Willer, HI;  Larry Williams, NE;  Ernest Zirkle, NJ

The 2011-2012 Nominations for USAHA officers and District Delegates as put forth by the Committee are as follows:

OFFICERS

PRESIDENT..........................David T. Marshall, Raleigh, North Carolina
PRESIDENT-ELECT......................David L. Meeker, Alexandria, Virginia
FIRST VICE-PRESIDENT.............Stephen K. Crawford, Concord, New Hampshire
SECOND VICE-PRESIDENT..............Bruce L. King, Salt Lake City, Utah
THIRD VICE-PRESIDENT...............David D. Schmitt, Des Moines, Iowa
TREASURER..........................Annette M. Whiteford, Sacramento, California

DISTRICT DELEGATES

NORTHEAST....... S. “Buzz” Klopp, Delaware; Ernest W. Zirkle, New Jersey
NORTH CENTRAL...............Velmar Green, Michigan; Jay Hawley, Indiana
SOUTH...................L. “Gene” Lollis, Florida; A. Gregario Rosales, Alabama
WEST.........................Bill Sauble, New Mexico; H. M. Richards, III, Hawaii

2011 RESOLUTIONS

RESOLUTION NUMBER: 1, 11, and 17 Combined -- APPROVED
SOURCE: USAHA/AAVLD COMMITTEE ON ANIMAL EMERGENCY MANAGEMENT
COMMITTEE ON IMPORT-EXPORT
COMMITTEE ON INTERNATIONAL STANDARDS

SUBJECT MATTER: INFRASTRUCTURE FOR ELECTRONIC CERTIFICATES OF VETERINARY INSPECTION FOR LIVESTOCK MOVEMENT BETWEEN CANADA AND THE UNITED STATES

BACKGROUND INFORMATION:

Electronic certificates of veterinary inspection (e-CVIIs) have proven advantages over certificates of veterinary inspection (CVIIs) that are issued
via paper form. Electronic CVIs have demonstrated a greater capability to trace, control, and contain livestock diseases. International livestock movements documented via e-CVIs would help to decrease the negative economic impacts that a significant livestock disease outbreak would have on the United States economy and the nation’s livestock industry by decreasing the time to trace movements and identify exposed animals. The use of e-CVIs for livestock in cross-border movements was listed as an action item of the Border Solutions Council and the Cross-border Livestock Health group at the 2010 and 2011 Pacific Northwest Economic Region (PNWER) meetings. Participants are concerned that extensive paperwork requirements impose significant costs on livestock buyers and sellers and may cause unnecessary stressful welfare conditions to animals in transit.

RESOLUTION:

The United States Animal Health Association urges the United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services and the Canadian Food Inspection Agency to collaborate in designing their Information Technology Systems so they are compatible in order to implement electronic certification to expedite movement of livestock across the United States-Canada border.

RESOLUTION NUMBER: 2 Combined with 4
SOURCE: USAHA/AAVLD COMMITTEE ON ANIMAL EMERGENCY MANAGEMENT
SUBJECT MATTER: NATIONAL ANIMAL HEALTH LABORATORY NETWORK FUNDING

RESOLUTION NUMBER: 3, 19 and 31 Combined -- APPROVED
SOURCE: USAHA/AAVLD COMMITTEE ON ANIMAL HEALTH SURVEILLANCE AND INFORMATION SYSTEMS COMMITTEE ON TRANSMISSIBLE DISEASES OF SWINE COMMITTEE ON SHEEP AND GOATS
SUBJECT MATTER: UNITED STATES NATIONAL LIST OF REPORTABLE ANIMAL DISEASES

BACKGROUND INFORMATION:

A National List of Reportable Animal Diseases (NLRAD) will be one uniform, science and policy based, nationally supported standard list of animal diseases. Standard uniform case finding and case reporting criteria will provide the basis for uniform reporting. The list will facilitate national and international commerce; assist in meeting international reporting obligations
NOMINATIONS AND RESOLUTIONS

to the World Organization for Animal Health (OIE) and trading partners; support generation of export certifications; and contribute to the assessment and reporting of the listed zoonotic and endemic animal diseases in the United States.

In 2006, the United States Animal Health Association (USAHA) and the American Association of Veterinary Laboratory Diagnosticians (AAVLD) formally identified the need for a unified national list of reportable animal diseases. USAHA previously recommended that the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), Centers for Epidemiology and Animal Health (CEAH) compile and evaluate current state reporting and notification requirements. Although all states have a required reportable diseases list, there is large variability in these lists. Requirements for federal reporting are related only to program diseases or foreign animal diseases.

In 2007, USAHA and AAVLD formally requested that USDA-APHIS-VS, in cooperation with state animal health officials and industry, develop a United States NLRAD. The NLRAD should include appropriate reporting criteria. The USDA-APHIS-VS supported drafting a list of diseases that may be considered national reportable diseases.

In 2008, USAHA and AAVLD requested that USDA-APHIS-VS task the existing National Animal Health Reporting System (NAHRS) subcommittee of the USAHA/AAVLD Joint Committee on Animal Health Surveillance and Information Systems, with support from the USDA-APHIS-VS-CEAH-National Surveillance Unit (NSU), with developing the NLRAD as well as the case definitions and reporting criteria for each disease on the list. The USDA-APHIS-VS supported this request.

From 2008-2010, the NAHRS Steering Committee in conjunction with the NSU has developed a NLRAD overview draft white paper and a proposed NLRAD. The NLRAD white paper describes the NLRAD reporting structure, the standard operating procedures for the approval and maintenance of the NLRAD, and case definitions and reporting criteria development. USDA-APHIS-VS and the National Animal Health Reporting System (NAHRS) subcommittee of the USAHA/AAVLD Joint Committee on Animal Health Surveillance and Information Systems continue to move forward with implementing a United States NLRAD.

The NLRAD is under review by National Assembly of State Animal Health Officials and VS Area Veterinarians in Charge with comments requested by September 23, 2011. The NLRAD has also been distributed to USAHA animal disease commodity committees with a request for discussion in Buffalo at the USAHA meeting and comments by October 30. After considering the current round of stakeholder comments with concurrence of the NAHRS subcommittee and final approval by VS management, it will be published as a cooperative State-Federal set of guidelines for reportable disease. In addition, once the NLRAD is finalized, VS will be requested to...
initiate the regulatory process to establish and maintain the NLRAD and associated reporting requirements.

RESOLUTION:
The United States Animal Health Association and the American Association of Veterinary Laboratory Diagnosticians request that the United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services, finalize the United States National List of Reportable Animal Diseases (NLRAD) and related NLRAD white paper and initiate the regulatory process to establish and maintain the NLRAD and associated reporting requirements.

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RESOLUTION NUMBER: 4, 2, 5, 20 and 23 Combined -- APPROVED
SOURCE: USAHA/AAVLD COMMITTEE ON THE NATIONAL ANIMAL HEALTH LABORATORY NETWORK
USAHA/AAVLD COMMITTEE ON ANIMAL EMERGENCY MANAGEMENT
USAHA/AAVLD COMMITTEE ON DIAGNOSTIC LABORATORY AND VETERINARY WORKFORCE DEVELOPMENT
COMMITTEE ON TRANSMISSIBLE DISEASES OF SWINE
COMMITTEE ON INFECTIOUS DISEASES OF HORSES

SUBJECT MATTER: National Animal Health Laboratory Network FUNDING

BACKGROUND INFORMATION:
The National Animal Health Laboratory Network (NAHLN) is our nation’s early warning system guarding against emerging and foreign animal diseases that threaten the nation’s food supply. The NAHLN also plays a large role in zoonotic disease surveillance and the protection of public health. The NAHLN has proven itself to be an effective way to expand and strengthen veterinary diagnostic capabilities in a coordinated network across the United States. Diagnostic capacity is a critical asset in case of major animal disease events, and any reduction in the NAHLN budget places our animal industries, the security of our food supply, and consequently our citizens’ health and the United States (U.S.) economy at enormous risk.

Federal support of the NAHLN allows veterinary diagnostic laboratories to perform high-consequence disease surveillance to protect against several foreign animal diseases, including foot-and-mouth disease (FMD) and avian influenza. Response to recent FMD outbreaks in Asia cost billions of dollars resulting in millions of cattle and swine destroyed and reducing food security. According to estimates by federal agencies, the cost to the U.S. for a similar outbreak in our country could be as much as $100 billion. Results from several studies show that for every hour FMD goes undetected, the cost of response increases by as much as $10 million. Surge capacity (increased sustained testing in case of a disease outbreak) in the network has been built to a level that will help offset disease-related economic losses to industry,
states and the federal government through rapid diagnostic deployment and efficient and secure communication. However, limited funding of the NAHLN to date has not allowed expansion of the NAHLN to achieve a level projected to more fully diminish losses from disease outbreaks.

At the FY 2010 funding level from the National Institute of Food and Agriculture’s Food and Agriculture Defense Initiative and from the United States Department of Agriculture, Animal and Plant Health Inspection Service to support the NAHLN and the NAHLN laboratory infrastructure, economic losses associated with response and recovery from a serious disease event, and possible human losses, will far exceed this figure if NAHLN capability is not increased. To sufficiently meet U.S. food security, and animal and public health needs, $30 million is needed annually to support a fully functional laboratory infrastructure and to continue enhancements for network capacity and information technology capabilities. Further, since the annual appropriations process creates challenges for laboratories in sustaining the federal investment into NAHLN infrastructure capacity and capability, a more stable funding mechanism on a multi-year basis is needed.

RESOLUTION:

The United States Animal Health Association and American Association of Veterinary Laboratory Diagnosticians request that the Secretary of Agriculture support and that Congress authorize $30 million in annual funding for the National Animal Health Laboratory Network (NAHLN). We further request that in order to adequately sustain the network to ensure food safety and security, animal and public health, and the United States economy, Congress fund the NAHLN through a stable funding mechanism.

The United States Animal Health Association and American Association of Veterinary Laboratory Diagnosticians urge Congress to fully fund the authorized amount to ensure that NAHLN infrastructure, capacity, and capability are maintained and enhanced.

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RESOLUTION NUMBER:  5 Combined with 4
SOURCE:  USAHA/AAVLD COMMITTEE ON DIAGNOSTIC LABORATORY AND VETERINARY WORKFORCE DEVELOPMENT

SUBJECT MATTER:  NATIONAL ANIMAL HEALTH LABORATORY NETWORK FUNDING

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REPORT OF THE COMMITTEE

RESOLUTION NUMBER: 6 -- APPROVED
SOURCE: USAHA/AAVLD COMMITTEE ON DIAGNOSTIC LABORATORY AND VETERINARY WORKFORCE DEVELOPMENT

SUBJECT MATTER: MAINTAINING A WELL-TRAINED FEDERAL VETERINARY FIELD WORKFORCE AND DEVELOPING A SYSTEM FOR CONTINUALLY IMPROVING ANIMAL HEALTH PROGRAMS AT THE FIELD LEVEL

BACKGROUND INFORMATION:
Because of budget cutbacks, the United States Department of Agriculture (USDA) is reorganizing the Animal and Plant Health Inspection Service (APHIS). APHIS reports that it can no longer operate as it has in the past, as current and projected funding streams will not support the agency’s existing operations and organizational structure. APHIS proposes to centralize its infrastructure by streamlining and consolidating its management to ensure the most efficient and effective use of resources provided. APHIS is considering actions that will eliminate programs not specifically funded in the budget; pursuing lower operating cost initiatives; reducing funding of selective cooperative agreements; and restricting hiring, training, travel, and services.

This causes concern that USDA-APHIS-Veterinary Services (VS) field programs will be underfunded or eliminated and the maintenance of well-trained USDA-APHIS employees in field locations will not be able to continue as they have in the past, which will negatively impact USDA-APHIS’ role in the protection of animal health. One of the primary reasons that USDA-APHIS-VS has been so successful in the past is that it has a veterinary field force that can effectively and efficiently work with states, industry and non-governmental organizations (NGOs) to prevent, control and eliminate animal diseases and pests. While many of the USDA-APHIS-VS field programs have been successfully completed, maintaining animal health is a continual process that requires a well-trained veterinary field workforce. Existing programs need to be monitored, and new diseases and pests will need to be addressed and eliminated. With USDA-APHIS budgets continually being reduced, there may be serious consideration given to reducing and/or eliminating federal animal disease prevention/control activities in the field. USDA-APHIS may become an advisory agency with no field workforce or hands-on experience to prevent, recognize, or respond to an animal or public health emergency.

The United States Animal Health Association should inform Congress of the importance of maintaining a well-trained federal veterinary field workforce to continue protecting animal health by controlling diseases and pests through comprehensive surveillance and response programs.

RESOLUTION:
The United States Animal Health Association urges Congress and the United States Department of Agriculture, Animal and Plant Health Inspection Service to maintain and improve the current federal veterinary field workforce to protect the nation’s animal and public health. Any significant reorganization in the veterinary workforce should be carried out in collaboration with state animal health authorities, animal industries and non-governmental organizations to ensure an adequate animal and public health infrastructure.

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RESOLUTION NUMBER:  7 -- APPROVED
SOURCE:  JOINT COMMITTEE ON DIAGNOSTIC LABORATORY AND VETERINARY WORKFORCE DEVELOPMENT
SUBJECT MATTER:  VETERINARY SERVICES INVESTMENT ACT

BACKGROUND INFORMATION:
The Veterinary Services Investment Act (VSIA) (SS1053, May 23, 2011) will help ensure a stable and safe food supply for citizens in the United States.

The American Veterinary Medical Association (AVMA) reports that 60 percent of the veterinary school graduates in 2009 entered private practice of which only five percent opted to practice large-animal medicine. The Government Accountability Office (GAO) has predicted a veterinarian shortage in the coming years. This shortage already exists in parts of rural America and shows signs of worsening unless current trends are reversed. There are urgent unmet needs for veterinary services within rural areas jeopardizing both animal and public health and the ability to trade animals and animal products interstate and internationally.

This legislation will establish a new competitive grant program to relieve veterinary shortage situations and support veterinary services. It will help address the challenges faced by America’s farmers and rural communities which rely heavily on large animal veterinarians. Grants awarded under the program may be used for a variety of purposes including:

- Promoting recruitment, placement, and retention of veterinarians, veterinary technicians, students of veterinary medicine and students of veterinary technology.
- Assisting veterinarians with establishing or expanding practices for the purpose of equipping veterinary offices, sharing in the overhead costs of such practices, or for the establishment of mobile veterinary facilities where at least a portion of such facilities will address education or extension needs.
- Providing financial assistance for veterinary students, veterinary interns and externs, fellows and residents, and veterinary technician students to
attend training programs in food safety or food animal medicine, to cover expenses other than tuition.

Establishing or expanding accredited veterinary education programs, veterinary residency and fellowship programs or veterinary internship programs, or veterinary internship and externship programs in coordination with accredited colleges of veterinary medicine.

Programs for tele-veterinary medicine where such practices shall at least in part contribute to veterinary extension, education, or research.

Assisting the office or position of a state veterinarian or animal health official to coordinate veterinary services and food protection issues.

Assessments of veterinarian shortage situations and preparation of applications for designation as a shortage situation.

Continuing education and extension, including distance-based education, for veterinarians, veterinary technicians, and other health professionals needed to strengthen veterinary programs and enhance food safety.

Recruiting and retaining faculty at accredited colleges of veterinary medicine.

Programs, in coordination with universities or local educational agencies, to encourage students in secondary schools to pursue careers in veterinary medical or science professions.

VSIA will be administered by the National Institute for Food and Agriculture, an agency within the United States Department of Agriculture. The Secretary of Agriculture shall award a preference to applications that document coordination between or with the state, national allied or regional veterinary organizations, or specialty boards recognized by AVMA; the applicable accredited veterinary education institution, accredited department of veterinary science, or department of comparative medicine; or the applicable state veterinarian or animal health official (or its equivalent); and will use the grant funds to help meet veterinary workforce or food protection needs.

RESOLUTION:

The United States Animal Health Association requests that the United States Congress pass and fund the Veterinary Services Investment Act.

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RESOLUTION NUMBER: 8 -- APPROVED
SOURCE: USAHA/AAVLD COMMITTEE ON DIAGNOSTIC LABORATORY AND VETERINARY WORKFORCE DEVELOPMENT

SUBJECT MATTER: VETERINARY PUBLIC HEALTH WORKFORCE AND EDUCATION ACT

BACKGROUND INFORMATION:

Veterinarians interested in pursuing a career in public health face additional financial burdens due to additional education requirements. Eighty
nine percent of today’s veterinary students have debt upon graduation of which 90.4% was incurred while in veterinary school. According to the Journal of the American Veterinary Medical Association, the mean educational debt for today’s veterinary medical graduate is approximately $142,000, with approximately 37% of students graduating in 2010 reporting debt exceeding $150,000.

The Veterinary Public Health Workforce Enhancement Act (PHSA) will increase the number of veterinarians working in public health in two ways. It establishes that “veterinary public health” professionals are intended to be included among the health professionals for purposes of two PHSA authorities: section 765, which provides for grants for expanding America’s public health workforce, and section 766, which establishes a loan repayment program for public health professionals.

RESOLUTION:

The United States Animal Health Association supports the Veterinary Public Health Workforce and Education Act and urges the United States Congress to pass and fund this legislation.

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RESOLUTION NUMBER: 9 -- APPROVED
SOURCE: USAHA/AAVLD COMMITTEE ON DIAGNOSTIC LABORATORY AND VETERINARY WORKFORCE DEVELOPMENT

SUBJECT MATTER: SUPPORT FOR SECTION 1433 FORMULA FUNDS FOR ANIMAL HEALTH AND RESEARCH

BACKGROUND INFORMATION:

Section 1433 Formula Funds (P.L. 95-113) have been in existence since 1977 and provide an extremely valuable source of funds for fundamental research on diseases of food producing animals. These funds are important for the Colleges of Veterinary Medicine and the Veterinary Science departments in the United States. In the past, these funds allowed food animal related research on local and emerging diseases; however, these funds have been steadily dwindling and eroded by inflation. As a result, college faculties are shifting efforts to National Institutes of Health (NIH) funded research which will not support research on agricultural animals or on food safety at the farm level. Section 1433 Formula Funds have also supported training graduate students in most colleges and veterinary science departments. There are no other funds available at this time to provide this much needed support. For a number of years the President’s budget had not included any money for Section 1433 Formula Funds, but Congress has provided less annually. In FY11, $2.95 million was appropriated to the fund.

RESOLUTION:
The United States Animal Health Association (USAHA) requests that the President include the authorized level of $10 million for Section 1433 Formula Funds (P.L. 95-113) in his Annual Budget request. USAHA also requests the House of Representatives and Senate Agriculture Appropriations Committees to fund Section 1433 Formula Funds (P.L. 95-113) at the authorized level of $10 million per year.

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RESOLUTION NUMBER: 10 -- APPROVED
SOURCE: USAHA/AAVLD COMMITTEE ON DIAGNOSTIC LABORATORY AND VETERINARY WORKFORCE DEVELOPMENT

SUBJECT MATTER: SUPPORT FOR FOOD ANIMAL RESIDUE AVOIDANCE DATABANK

BACKGROUND INFORMATION:
Food Animal Residue Avoidance Databank (FARAD), in existence since 1982, provides scientifically valid information on how to avoid drug, environmental and pesticide contaminant residues in food animals and it helps to avert food safety crises. No other federal or private entity duplicates FARAD. FARAD develops and maintains a unique food safety databank that provides information to veterinarians, livestock producers, and state and federal regulatory and extension specialists on avoiding both animal drug residues and environmental contaminants in meat, milk and eggs. FARAD’s databank provides information regarding the time-course of drug and chemical depletion in blood and tissues of animals following the routine use of drugs in animal agriculture, for the extra-label use of drugs in animal agriculture, and during food contamination emergencies which might arise from exposure to environmental toxins, particularly pesticides, either accidentally or intentionally introduced into the food supply. Additionally, FARAD provides rapid response assistance through both its telephone hotline and web access for inquiries concerning residue issues that affect food animal health and food product contamination. FARAD provides assistance in trade matters by maintaining databanks of foreign drug approvals and it trains veterinary students and veterinary medical residents in the principles of residue avoidance.

RESOLUTION:
The United States Animal Health Association urges the President to request and the United States Congress to fund the Food Animal Residue Avoidance Databank at $2.5 million annually.  *****

RESOLUTION NUMBER:  11 Combined with 1
SOURCE: COMMITTEE ON IMPORT-EXPORT
SUBJECT MATTER: INFRASTRUCTURE FOR ELECTRONIC CERTIFICATES OF VETERINARY INSPECTION FOR LIVESTOCK MOVEMENT BETWEEN CANADA AND THE UNITED STATES

RESOLUTION NUMBER: 12 -- APPROVED
SOURCE: COMMITTEE ON JOHNE’S DISEASE

SUBJECT MATTER: NATIONAL VETERINARY SERVICES LABORATORY CERTIFICATION FOR DAIRY HERD IMPROVEMENT LABORATORIES

BACKGROUND INFORMATION:
Evaluation of United States Department of Agriculture (USDA) approved milk enzyme linked immunosorbent assay (ELISA) has shown that milk ELISA is comparable in accuracy to currently available serum ELISA kits. Previous resolutions from the Committee on Johne’s Disease to include milk ELISA testing of Dairy Herd Improvement (DHI) samples as official screening tests for the Voluntary Bovine Johne’s Disease Control Program (VBJDCP) have been approved by the United States Animal Health Association (USAHA). The national Dairy Herd Improvement Association (DHIA), through efforts of Quality Certification Services (QCS), has developed and implemented a laboratory milk ELISA proficiency program that meets the standards of proficiency for DHI laboratories and exceeds the standards of proficiency required by the milk ELISA proficiency program administered by the USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), National Veterinary Services Laboratory (NVSL). The availability of two milk ELISA proficiency programs increases the costs of participation and testing for DHI laboratories. In an effort to reduce costs to DHI testing laboratories and to increase testing infrastructure for milk ELISA testing, a consolidation of the two proficiency systems is recommended that would meet the requirements of each of the individual proficiency programs.

RESOLUTION:
The United States Animal Health Association, recognizing the Voluntary Bovine Johne’s Disease Control Program is a voluntary program, requests that the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), National Veterinary Services Laboratory (NVSL) implement the protocol for Dairy Herd Improvement laboratory certification through the USDA-APHIS-VS-NVSL Johne’s milk enzyme linked immunosorbent assay (ELISA) proficiency test program using the Quality Certification Services ELISA Proficiency Program test data.
RESOLUTION NUMBER: 13 and 39 Combined – APPROVED AS AMENDED

SOURCE: COMMITTEE ON JOHNE’S DISEASE COMMITTEE ON TUBERCULOSIS

SUBJECT MATTER: A MULTI-STATE INITIATIVE FOR MYCOBACTERIAL DISEASES IN ANIMALS

BACKGROUND INFORMATION:
Maintaining research and outreach programs is imperative to continued advancement of diagnostics, vaccines, and methods to prevent Johne’s disease from devastating dairy cattle herds. The Johne’s Disease Integrated Program (JDIP) has developed an excellent research and outreach infrastructure that is effectively addressing these issues. This same infrastructure is well positioned to help address other mycobacterial diseases including bovine tuberculosis. The JDIP is currently in its final year of United States Department of Agriculture, National Institute of Food and Agriculture Coordinated Agricultural Project funding and is seeking ways to maintain parts of the existing infrastructure such as that used for the mastitis multi-state initiative.

RESOLUTION:
The United States Animal Health Association requests that United States Department of Agriculture, National Institute of Food Agriculture, and Experiment Station Directors support the establishment of a multi-state initiative for mycobacterial diseases of animals.

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RESOLUTION NUMBER: 14 – APPROVED
SOURCE: COMMITTEE ON CAPTIVE WILDLIFE AND ALTERNATIVE LIVESTOCK

SUBJECT MATTER: CHRONIC WASTING DISEASE FUNDING FOR CAPTIVE CERVIDS

BACKGROUND INFORMATION:
The proposed rule for Chronic Wasting Disease (CWD) Herd Certification and Interstate Movement of Captive Cervids in farmed cervidae requires that all farmed cervidae greater than 12 months of age that die or are slaughtered must be tested for CWD. Farmed cervidae producers across the nation have complied with testing requirements, in large part because laboratory costs for CWD testing have traditionally been paid with United States Department of Agriculture (USDA) funds.

The CWD testing protocol that is recommended for farmed cervidae is the immunohistochemistry (IHC) test using formalin fixed samples of brain stem and retropharyngeal lymph node from each animal. It is the most...
sensitive and specific test for detecting CWD. The test is expensive and costs at least $25.00 per slide to perform at USDA approved laboratories.

There is an urgency to maintain USDA funding to cover the costs of CWD testing for farmed cervidae. If USDA funding for CWD tests ends and farmed cervidae producers are forced to cover the cost of such tests, there is a real possibility that producer compliance with CWD testing requirements will decrease. Without producer cooperation, the national CWD control program for farmed cervidae could collapse.

RESOLUTION:
The United States Animal Health Association urges the United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services to continue to provide funding to cover the laboratory costs of testing farmed cervidae for Chronic Wasting Disease by immunohistochemistry at all approved laboratories.

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RESOLUTION NUMBER: 15 -- APPROVED
SOURCE: COMMITTEE ON CAPTIVE WILDLIFE AND ALTERNATIVE LIVESTOCK

SUBJECT MATTER: CHRONIC WASTING DISEASE HERD CERTIFICATION AND INTERSTATE MOVEMENT FINAL RULE

BACKGROUND INFORMATION:
Implementation of rules for Chronic Wasting Disease (CWD) that define the CWD herd certification program (9 CFR 55 Subpart B) and requirements for interstate movement of farmed cervidae (9 CFR 81) has been delayed since 2006.

There is an urgency to finalize these rules to ensure that CWD certification programs are uniformly administered in all states and that all farmed cervidae that move from state to state meet the same requirements. These rules are critically important to the survival of the farmed cervidae industry. These rules are needed to preserve the ability of producers to move farmed cervidae and their products interstate and internationally without unnecessary restrictions.

RESOLUTION:
The United States Animal Health Association urges the United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services to finalize rules for Chronic Wasting Disease herd certification programs (9 CFR 55 Subpart B) and interstate movement of farmed cervidae (9 CFR 81).

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RESOLUTION NUMBER:  16 -- APPROVED
SOURCE: COMMITTEE ON CAPTIVE WILDLIFE AND ALTERNATIVE LIVESTOCK

SUBJECT MATTER: LIVE ANIMAL TESTING FOR CHRONIC WASTING DISEASE

BACKGROUND INFORMATION:
Detection of Chronic Wasting Disease (CWD) in live animals is an important component of CWD Prevention and Control Programs. With the funding decrease for CWD indemnification, the need has increased for additional diagnostic tools to monitor CWD positive herds and epidemiologically linked herds that may be maintained in quarantine rather than depopulated. The use of recto-anal mucosa associated lymphoid tissue (RAMALT) has been approved as a live animal test for Scrapie. There have been numerous studies evaluating the sensitivity and specificity of RAMALT in cervids. There are several additional advantages to RAMALT sampling. There is a large amount of suitable tissue to sample and multiple sites can be sampled allowing repeat sampling over time.

RESOLUTION:
The United States Animal Health Association requests that the United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services evaluate live animal tests, including the rectal biopsy (RAMALT), as a live animal test for Chronic Wasting Disease.

RESOLUTION NUMBER:  17 Combined with 1
SOURCE: COMMITTEE ON INTERNATIONAL STANDARDS

SUBJECT MATTER: INFRASTRUCTURE FOR ELECTRONIC CERTIFICATES OF VETERINARY INSPECTION FOR LIVESTOCK MOVEMENT BETWEEN CANADA AND THE UNITED STATES

RESOLUTION NUMBER:  18 APPROVED
SOURCE: COMMITTEE ON TRANSMISSIBLE DISEASES OF SWINE

SUBJECT MATTER: COMPREHENSIVE AND INTEGRATED SWINE SURVEILLANCE

BACKGROUND INFORMATION:
The United States Department of Agriculture (USDA) and the United States pork industry have made significant progress in the development of
the infrastructure necessary for implementing a comprehensive and integrated surveillance system (CISS) for swine diseases. The United States pork industry continues to implement the Swine Identification Plan which will support risk-based surveillance and statistically significant sampling from swine populations. The industry has also continued to prioritize and communicate surveillance objectives for inclusion in a CISS for swine diseases. Critical for implementation of CISS is the role of the USDA, Animal and Plant Health Inspection Service, Veterinary Services, National Surveillance Unit to balance surveillance objectives with available surveillance streams, estimate costs and provide analysis back to the U.S. pork industry. For various reasons related to issues with infrastructure and resources, which have recently been addressed with targeted funding for CISS, this process has not occurred for previously identified surveillance objectives thus limiting CISS implementation.

RESOLUTION:
The United States Animal Health Association (USAHA) urges the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), National Surveillance Unit to continue the implementation of industry surveillance priorities, through appropriate risk-based surveillance streams and communicate the results. A progress report from USDA-APHIS-VS should be provided to the Swine Species Committee at the 2012 National Institute of Animal Agriculture annual meeting and to the USAHA Committee on Transmissible Diseases of Swine.

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RESOLUTION NUMBER:  19 Combined with 3
SOURCE:  COMMITTEE ON TRANSMISSIBLE DISEASES OF SWINE
SUBJECT MATTER:  UNITED STATES NATIONAL LIST OF REPORTABLE ANIMAL DISEASES

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RESOLUTION NUMBER:  20 Combined with 4
SOURCE:  COMMITTEE ON TRANSMISSIBLE DISEASES OF SWINE
SUBJECT MATTER:  NATIONAL ANIMAL HEALTH LABORATORY NETWORK FUNDING

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RESOLUTION NUMBER:  21 -- APPROVED AS AMENDED
SOURCE:  COMMITTEE ON INFECTIOUS DISEASES OF HORSES
SUBJECT MATTER: EQUINE PIROPLASMOSIS – RELEASE OF TEST NEGATIVE TREATED HORSES

BACKGROUND INFORMATION:
Over the past two years, approximately 170 Equine Piroplasmosis (EP) affected horses in the United States were enrolled in an approved treatment plan for *Theileria equi* (*T. equi*) designed by the United States Department of Agriculture, Agriculture Research Service. Preliminary reports on the treatment outcome are very encouraging. A high percentage of the horses tested negative on polymerase chain reaction testing soon after completion of treatment. Twenty-five (25) post treatment animals tested negative via transfusion into splenectomized horses with all recipient animals remaining serologically negative providing clear evidence of the effectiveness of the treatment plan. While most post treatment horses remain positive on competitive Enzyme-Linked Immunosorbent Assay (cELISA), a significant number test negative on both cELISA and Complement Fixation and therefore no longer meet the case definition for EP.

A national guideline for state quarantine release of cELISA test negative post treatment horses enrolled in an approved treatment plan would promote understanding and cooperation among states, preventing unnecessary test requirements being placed on such horses moving interstate.

RESOLUTION:
The United States Animal Health Association requests that the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) develop and publish guidelines for Equine Piroplasmosis (EP) *Theileria equi* test negative horses after completion of an approved EP treatment plan and that have met the following conditions to be considered for state quarantine release:

- Enrolled in the USDA-APHIS-VS/USDA, Agriculture Research Service (ARS) treatment research program as per VS Memo 555.20; AND
- Treated using the USDA-ARS published imidocarb treatment protocol under state or federal supervision; AND
- Be identified with ISO-compliant microchip and that the identification number be held in a repository accessible by states; AND
- Nested real-time reverse transcriptase polymerase chain reaction and complement fixation test negative on post-treatment testing; AND
- Negative by transfusion to a splenectomized horse OR negative by the USDA-ARS Western Blot clearance test; AND
- Competitive Enzyme-Linked Immunosorbent Assay (cELISA) negative at USDA-APHIS-VS National Veterinary Services Laboratory; Additionally, annual cELISA tests should be conducted for the first three years after release as added assurance of disease freedom.

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RESOLUTION NUMBER: 22 -- APPROVED
SOURCE: COMMITTEE ON INFECTIOUS DISEASES OF HORSES

SUBJECT MATTER: Equine Piroplasmosis - Importation Testing

BACKGROUND INFORMATION:

Equine Piroplasmosis (EP) is classified as a Foreign Animal Disease to the United States. However, it is assumed that the disease exists at some unknown prevalence level in horses that are native to the United States or horses that have been imported into the United States. This assumption is based on the fact that prior to February 1, 2004, the “official test” for Piroplasmosis, conducted on equine animals presented for importation into the United States was the Complement Fixation (CF) test. An upgraded competitive enzyme linked immunosorbent assay (cELISA) test was specified as the “official test” on August 22, 2005, and is highly unlikely to yield “false negative” results on chronically EP infected adult horses.

While the cELISA has a significantly higher sensitivity in detecting the chronically infected EP horse, the sensitivity to detection of the acutely infected horse is much lower when compared to the CF test. Recently, through research and EP disease investigations, there have been cases where acutely EP infected horses have tested negative on the cELISA test but positive on the CF test. As a result, the Equine Piroplasmosis Working Group recommended that the definition of a confirmed case of EP be defined as, “an equid that has tested positive by the National Veterinary Services Laboratories (NVSL) with either a complement fixation (CF) test or a competitive enzyme linked immunosorbent assay (cELISA).” This definition was incorporated into domestic policy in Veterinary Services Memorandum 555.20.

RESOLUTION:

The United States Animal Health Association urges the United States Department of Agriculture, Animal and Plant Health Inspection Services, Veterinary Services, National Center for Import and Export, to require a negative Complement Fixation test and a negative competitive enzyme linked immunosorbent assay test for Equine Piroplasmosis (Theileria equi and Babesia caballi) prior to importation of equids into the United States.

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RESOLUTION NUMBER: 23 Combined with 4
SOURCE: COMMITTEE ON INFECTIOUS DISEASES OF HORSES

SUBJECT MATTER: NATIONAL ANIMAL HEALTH LABORATORY NETWORK FUNDING

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RESOLUTION NUMBER:  24 -- APPROVED  
SOURCE:  COMMITTEE ON BRUCELLOSIS  

SUBJECT MATTER:  USE OF BUFFERED ACID PLATE ANTIGEN AND FLOURESCENT POLARIZATION ASSAY IN CERVIDS  

BACKGROUND INFORMATION:  
The United States Animal Health Association’s (USAHA) Brucellosis Scientific Advisory Subcommittee evaluated data presented by Ryan Clarke on the use of buffered acid plate antigen (BAPA) and fluorescent polarization assay (FPA) for the diagnosis of *Brucella abortus* in elk. The subcommittee found that these tests offer sensitivities and specificities similar to currently approved tests for cervids. Additionally, these tests are cheaper, easier and faster for many laboratories to perform. The scientific advisory subcommittee of the Committee on Brucellosis recommended the BAPA be approved as a screening test for brucellosis in cervids, and that the FPA be approved as a confirmatory test for brucellosis in cervids.  

RESOLUTION:  
The United States Animal Health Association urges that the United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services include buffered acid plate antigen as a presumptive test and fluorescent polarization assay as a presumptive or a confirmatory test for the use of brucellosis diagnosis in cervids.  

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RESOLUTION NUMBER:  25 -- APPROVED  
SOURCE:  COMMITTEE ON BRUCELLOSIS  

SUBJECT MATTER:  REQUESTING ASSISTANCE FROM THE CENTERS FOR EPIDEMIOLOGY AND ANIMAL HEALTH  

BACKGROUND INFORMATION:  
Herd depopulation of brucellosis affected herds has been an important component of the Emergency Action Brucellosis Eradication Program. Depopulation with associated indemnification may be needed intermittently in the three Greater Yellowstone Area (GYA) states that face the continual threat of brucellosis transmission from infected wildlife. 

With the federal brucellosis eradication program taking a new direction per the Interim Brucellosis Rule [APHIS–2009–0083], and Tuberculosis/Brucellosis Framework [APHIS-2011-0044], depopulation of brucellosis affected herds is no longer mandatory, but rather the decision to depopulate or proceed with a test and removal program is made based on the epidemiological investigation and other factors. It would be beneficial to
have a transparent system that defines the decision criteria used by Veterinary Services to determine if a herd qualifies for depopulation.

In 2010, the Subcommittee on Brucellosis in the Greater Yellowstone Area (SBGYA) drafted a Depopulation Decision Matrix that attempts to provide a quantitative assessment of various criteria which should be assessed prior to decision making on the disposition of affected herds. While recognizing the potential benefit of the matrix in herd management, an epidemiological and statistical review may improve its utility. The SBGYA prefers to focus on improving this depopulation matrix and opposes utilizing a depopulation model originally developed for the Tuberculosis Eradication Program. Application of any model should be based on brucellosis epidemiology and input from state and tribal animal health officials.

**RESOLUTION:**

The United States Animal Health Association (USAHA) requests that the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services/Centers for Epidemiology and Animal Health provide technical assistance to the Committee on Brucellosis of the USAHA in an epidemiologic analysis of the depopulation matrix components to improve its utility and applicability to herds affected with brucellosis. Further, the USAHA requests USDA-APHIS to implement the updated matrix as part of a transparent decision process before the next USAHA meeting.

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**RESOLUTION NUMBER: 26 -- APPROVED**

**SOURCE:** COMMITTEE ON BRUCELLOSIS

**SUBJECT MATTER:** CALFHOOD VACCINATION OF BISON UP TO TWENTY-FOUR MONTHS OF AGE

**BACKGROUND INFORMATION:**

The United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services requested that United States Animal Health Association’s Brucellosis Scientific Advisory Subcommittee evaluate the use of *Brucella abortus* “Strain RB 51 vaccine” in bison between the age of 12 and 18 months due to the later maturity of bison as compared to cattle. Data was previously presented by Dr. Steven Olsen regarding serological responses in bison calves vaccinated with RB 51 between the ages of 12 and 24 months. Bison calves vaccinated during this time frame remained seronegative after vaccination. The scientific advisory subcommittee of the Brucellosis Committee recommended the use of this vaccine in this age of animal.

**RESOLUTION:**
The United States Animal Health Association urges that the United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services adjust the allowable age of RB51 official calfhood vaccination of bison through 24 months of age.

RESOLUTION NUMBER: 27 -- APPROVED
SOURCE: COMMITTEE ON BRUCELLOSIS
SUBJECT MATTER: REPORTING OF FOLLOW UP ON TRACE INVESTIGATIONS FROM SUSPECT ANIMALS

BACKGROUND INFORMATION:

The success of disease eradication programs relies on successful epidemiological investigations and follow-up. Investigations which are timely and complete provide the greatest opportunity for isolating and/or removing infected animals and subsequent control and eradication of livestock diseases. While protecting the privacy of individual producers, it is imperative that outcomes of investigations be available to other animal health officials, and withstands peer review. This allows animal health officials to make informed, reasoned, and effective decisions to protect the nation’s and state’s animal health industries.

Recognizing this need, United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) compiled and distributed comprehensive summaries during a number of recent disease outbreaks including contagious equine metritis, piroplasmosis and equine herpesvirus.

With the recent departure from state disease status classification systems for tuberculosis and brucellosis in favor of a regional or local response, dissemination of this type of information on these diseases significantly increased in importance. Indeed, USDA-APHIS-VS has responded to requests from the National Assembly of State Animal Health Officials by compiling and distributing investigation reports to animal health officials on tuberculosis and brucellosis. These reports, while useful, need to also include the status of epidemiological traces on a periodic basis to be most beneficial.

RESOLUTION:

The United States Animal Health Association (USAHA) urges that United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) continue to compile and distribute, to state and tribal animal health officials, investigation reports on brucellosis on a monthly basis and provide immediate reporting and frequent updating of emerging disease events. Further the USAHA urges
NOMINATIONS AND RESOLUTIONS

USDA-APHIS-VS, the states and tribes to include status of trace investigations, including a summary of unsuccessful brucellosis trace investigations in these reports.

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RESOLUTION NUMBER: 28 -- APPROVED AS AMENDED
SOURCE: COMMITTEE ON SCRAPIE

SUBJECT MATTER: SEPARATE SHEEP AND GOAT COMMODITY HEALTH LINE ITEM

BACKGROUND INFORMATION:

In FY2011, the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) primarily addressed sheep and goat health/disease issues through the National Scrapie Eradication Program (NSEP) and National Animal Health Monitoring System (NAHMS) studies. For FY2012, USDA-APHIS-VS has requested that Congress approve commodity-based funding which would include horses, cervids, sheep, and goats in a single line item where funding could be transferred between the commodities based on priorities identified by USDA-APHIS-VS and its partners. The proposed grouping of these species is reminiscent of the failed Miscellaneous Diseases line item in the USDA-APHIS-VS budget of over 20 years ago.

The United States Animal Health Association is concerned that sheep and goat funding may be diverted to address needs of other species, which could jeopardize the eradication of scrapie from the United States and the health and well-being of sheep and goats.

The currently proposed species grouping of Equines, Cervids, and Small Ruminants (sheep and goats) is not appropriate to serve the health and disease needs of such a diverse group of animals. Equines and Cervids have very few common health and disease issues with Sheep and Goats. Emerging diseases in each of the species in the proposed grouping will most likely result in even less commonality in disease/health priorities among these species.

RESOLUTION:

The United States Animal Health Association urges the United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services to establish a separate line item for Sheep and Goat Health.

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REPORT OF THE COMMITTEE

RESOLUTION NUMBER: 29 and 33 Combined -- APPROVED
SOURCE: COMMITTEE ON SCRAPIE
COMMITTEE ON SHEEP AND GOATS

SUBJECT MATTER: SCRAPIE ERADICATION PROGRAM – SURVEILLANCE LEVELS

BACKGROUND INFORMATION:
To continue progress toward scrapie eradication, enhanced surveillance and enforcement of regulations is paramount. The National Scrapie Eradication Program (NSEP) began in 2001 and has made excellent progress as demonstrated by a 96 percent reduction of scrapie in sheep diagnosed positive at slaughter as adjusted for face color. At this time the best available epidemiological analysis suggests that, with adequate funding, eradication is possible by 2017. However, as described in the National Scrapie Surveillance Plan, funding is currently inadequate to meet surveillance goals. Specifically, funding is needed to insure that sampling goals are met for both sheep and goats and that the information system is designed to maximize the value of the data collected. Also, the number of scrapie-positive animals that could be traced from slaughter was only 80 percent in FY 2011. Surveillance, identification compliance, and producer education must be significantly increased in order to find the diminishing number of scrapie-infected flocks/herds.

As the NSEP nears success, maximum surveillance is needed to achieve the final goal of eradication. We are concerned that federal budget constraints may jeopardize the ability to carry out the targeted surveillance needed for final scrapie eradication.

RESOLUTION:
The United States Animal Health Association urges the United States Department of Agriculture, Animal and Plant Health Inspection Services, Veterinary Services to maintain or increase scrapie surveillance levels for sheep, and increase surveillance levels for goats.

RESOLUTION NUMBER: 30 -- APPROVED AS AMENDED
SOURCE: COMMITTEE ON TRANSMISSIBLE DISEASES OF POULTRY AND OTHER AVIAN SPECIES

SUBJECT MATTER: UNITED STATES DEPARTMENT OF AGRICULTURE, ANIMAL AND PLANT HEALTH INSPECTION SERVICE’S ROLE IN PRE-HARVEST FOOD SAFETY

BACKGROUND INFORMATION:
Human foodborne illness associated with poultry meat consumption continues to be a significant public health concern within the United States as
evidenced by The United States Department of Agriculture’s (USDA) recent FY 2011 – 2016 FSIS Strategic Plan which identifies the following Strategic Theme:

Strategic Theme: Understand and Influence the Farm-to-Table Continuum
- Goal 5: Effectively use science to understand foodborne illness and emerging trends
- Goal 6: Implement effective policies to respond to existing and emerging risks

We believe that USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services’ (VS) mission is to partner with, support, and assist other Agencies that have regulatory authority in this area.

USDA-APHIS-VS, through the National Poultry Improvement Plan, National Anti-Microbial Resistance Monitoring System (NARMS) and the USDA-APHIS-VS National Veterinary Services Laboratory (NVSL), has extensive knowledge of on-farm practices in animal agriculture along with the core competencies necessary for pre-harvest food safety outbreak investigations. This expertise makes USDA-APHIS-VS the obvious candidate-agency for undertaking the pre-harvest food safety effort consistent with USDA-APHIS-VS 2015 vision. One Health and pre-harvest food safety are 2 of the 4 documented core pillars of this vision. Additionally, USDA-APHIS-VS mission supports the Center for Disease Control's One Health Strategic Plan and the Food Safety Inspection Service Strategic Plan for 2011-2016.

Recommended activities for USDA-APHIS-VS include:
- Direct the National Animal Health Monitoring System program to perform baseline prevalence studies for salmonella and campylobacter at the turkey and chicken breeder and progeny farm and hatchery level, determine antimicrobial resistance profiles at each stage of production, and identify effective intervention strategies;
- Approach the Center for Veterinary Medicine to return authority for evaluation and approval of food safety vaccines and competitive exclusion products to the Center for Veterinary Biologics.
- Continue to fully fund the ongoing efforts of the USDA-APHIS-VS-NVSL and support for the NARMS program.

RESOLUTION:

The United States Animal Health Association urges that the Secretaries of the United States Department of Agriculture (USDA), and the United States Department of Health and Human Services develop a collaborative, unified approach to federal pre-harvest food safety efforts, utilizing the expertise of the USDA, Animal and Plant Health Inspection Service, Veterinary Services.

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REPORT OF THE COMMITTEE

RESOLUTION NUMBER: 31 Combined with 3
SOURCE: COMMITTEE ON SHEEP AND GOATS

SUBJECT MATTER: UNITED STATES NATIONAL LIST OF REPORTABLE ANIMAL DISEASES

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RESOLUTION NUMBER: 32 Combined with 34
SOURCE: COMMITTEE ON SHEEP AND GOATS

SUBJECT MATTER: Q-FEVER (COXIELLA BURNETTI) VACCINE FOR SHEEP AND GOATS AND FOR HUMANS IN THE UNITED STATES

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RESOLUTION NUMBER: 33 Combined with 29
SOURCE: COMMITTEE ON SHEEP & GOATS

SUBJECT MATTER: SCRAPIE ERADICATION PROGRAM – SURVEILLANCE LEVELS

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RESOLUTION NUMBER: 34 and 32 Combined -- APPROVED
SOURCE: COMMITTEE ON PUBLIC HEALTH AND RABIES COMMITTEE ON SHEEP AND GOATS

SUBJECT MATTER: Q-FEVER (COXIELLA BURNETTI) VACCINE FOR SHEEP AND GOATS AND FOR HUMANS IN THE UNITED STATES

BACKGROUND INFORMATION:

Q-Fever is a zoonotic disease caused by the bacterium Coxiella burnetti. Coxiella infection is found in many species in many countries of the world, including the United States. The disease is a major cause of abortion in sheep and goats, which results in significant economic losses to producers, but also results in significant risk of transmission to human beings. Exposure to the products of abortion (or raw milk products) either directly or through environmental contamination poses a significant public health risk, as demonstrated by the recent Q-fever epidemic (human and goat) in the Netherlands.

Currently there is no vaccine available in the United States to prevent Coxiella burnetti infection or abortion in sheep and goats. Such a vaccine is available in Europe. The availability/approval of a safe and effective sheep and goat vaccine for Coxiella burnetti in the United States would serve to safeguard human health and prevent production losses due to this potentially
devastating disease. Humans not in direct contact with aborting animals also face some risk of indirect environmental exposure, so effective vaccination of sheep and goats could play a key role in minimizing human exposure. Additionally, the availability and approval of a safe and effective human vaccine would provide protection for those with occupational risk of exposure to *Coxiella burnetti*.

**RESOLUTION:**

In priority order:

First, the United States Animal Health Association (USAHA) encourages the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) to facilitate the licensure of a safe and effective Q-Fever (*Coxiella burnetti*) vaccine for sheep and goats.

Second, the USAHA encourages the Food and Drug Administration to facilitate the licensure of a safe and effective Q-Fever (*Coxiella burnetti*) vaccine for humans.

Third, the USAHA encourages USDA-APHIS-VS, Center for Veterinary Biologics to facilitate the importation, for investigation and research, of available animal Q-fever (*Coxiella burnetti*) vaccines from the European Union and Australia.

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**RESOLUTION NUMBER: 35 -- APPROVED**

**SOURCE:** COMMITTEE ON PUBLIC HEALTH AND RABIES

**SUBJECT MATTER:** INCREASED FY2013 FUNDING FOR THE UNITED STATES DEPARTMENT OF AGRICULTURE, ANIMAL AND PLANT HEALTH INSPECTION SERVICE, WILDLIFE SERVICES ORAL RABIES VACCINATION (ORV) PROGRAM

**BACKGROUND INFORMATION:**

Wildlife rabies is a serious public health concern. The veterinary community, both public and private, has as a fundamental obligation, the 'responsibility to apply their knowledge and skills to ensure control of rabies at the animal source'. This was a conclusion of the 2011 World Organization for Animal Health (OIE) conference on rabies control. Rabies control is the embodiment of a One Health initiative. In fact, the United Nations Food and Agriculture Organization (FAO) now believes that rabies and foot-and-mouth disease should be the next two global disease targets for eradication now that rinderpest has been eradicated.

Globally, the OIE now estimates that 70,000 people worldwide die each year from rabies. ProMED (September 28, 2011) states that rabies is one of the world’s most lethal zoonotic diseases, killing more people than severe
acute respiratory syndrome, H5N1 and dengue fever combined. Domestically, according to the 2010 Centers for Disease Control and Prevention (CDC) Rabies Surveillance Report, wildlife rabies is still responsible for 92% of all reported rabies cases in the United States (Blanton, et al. JAVMA, 2011). The use of licensed oral rabies vaccine (ORV) programs has been effective in controlling rabies in certain terrestrial wildlife reservoir species since the early 1990’s.

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service, Wildlife Services ORV program is designed to reduce transmission of wildlife rabies to domestic pets, livestock and humans. It is estimated that there are over 40,000 administrations of Post Exposure Prophylaxis (PEP) against rabies in humans in the United States (U.S.) annually at an average cost of $4,042 per treatment (Meltzer, et al. Vaccine, 2008) resulting in over $160,000,000 per year in associated human health care costs. These costs do not include indirect impacts on the population from anxiety, fear and trauma associated with rabies threats to people, their pets and livestock. In spite of a public health strategy that is effective in preventing human rabies deaths in the U.S., the financial cost of coexistence with wildlife rabies is high, exceeding $300,000,000 annually (Slate, et al. Proceedings 20th Vertebrate Pest Conference, 2002). According to Shwiff (Shwiff, et al., unpublished 2011), if ORV programs are allowed to lapse the annual negative economic impact could be approximately $45 million per year in the U.S.

The ORV campaigns in conjunction with other rabies control measures, such as mandatory dog and cat vaccination and recommended livestock and equine vaccination programs, are effective and are part of the veterinary community’s One Health initiative responsibility. Regular distribution of oral rabies vaccines to immunize specific wildlife species increases the percentage of rabies immune animals living within the ORV baiting zones. Creating a sustained reservoir population of individual immune animals results in an overall decrease of wildlife rabies cases.

The level of ORV programs’ success in the U.S. can be quantified as follows: transmission of the canine strain of rabies in south Texas coyote populations has been eliminated; the westward expansion of raccoon rabies strain has been halted at the Appalachian Mountains; the gray fox strain of rabies has been confined in the Southwest and the epizootic area is being consolidated and reduced; and, strategies have been developed to address wildlife rabies outbreaks in urban environments, especially in the Northeastern U.S. Today, federal and state sponsored ORV programs, supported by the CDC, continue to monitor areas cleared of wildlife rabies while addressing new challenges. Due to the level of success achieved to date, the federal government has signed a tri-national agreement with Canada and Mexico called the North American Rabies Plan. A critical component of this plan is to control wildlife rabies.

Because of the economic downturn in the U.S. economy, all ORV programs (state and federal) are now faced with rapidly declining levels of
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governmental funding and resources while public support remains high. Ironically, as funding levels for U.S. ORV programs decline societal changes have led to increasing numbers of interactions between humans and wild animals in urban habitats. Today and in the future, wildlife rabies prevention is, and will continue to be, a key factor in maintaining the integrity of rabies control in the U.S.

The United States Animal Health Association agrees with OIE that the best place to address rabies control is at the animal source. Wildlife species are the rabies reservoir in the United States. The funding level requested would allow the USDA to maintain ongoing logistical support and rabies case surveillance necessary for the program, while maintaining and/or increasing existing rabies-immune target wildlife populations. The maintenance of sufficient levels of immunity in the existing wildlife ORV zones is essential to assure program integrity. This funding level would also allow the ORV Program to be less dependent on emergency funding each year for program integrity and would advance research and development of new vaccines, baits and control strategies. Funding at this level will have the additional benefit of job maintenance and creation, especially in rural locales. The ORV Program, a One Health initiative, promotes animal and human health and alleviates the burden of additional health care costs associated with rabies including disparities between rural, suburban and urban communities.

RESOLUTION:

The United States Animal Health Association requests the 113th Congress to appropriate at least $28 million in the FY2013 budget line item for the United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, Oral Rabies Vaccine Program.

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RESOLUTION NUMBER: 36 -- APPROVED
SOURCE: COMMITTEE ON FOREIGN AND EMERGING DISEASES

SUBJECT MATTER: FUNDING FOR DEFENSE OF UNITED STATES AGRICULTURE AND FOOD

BACKGROUND INFORMATION:

The United States agriculture and food systems are vulnerable to diseases, pests, or poisonous agents that occur naturally, are unintentionally introduced, or are intentionally delivered by acts of terrorism. America's agriculture and food system is an extensive, open, interconnected, diverse, and complex structure providing potential targets for terrorist attacks. We should provide the best protection possible against an attack on the United States agriculture and food system, which could have catastrophic health and economic effects. Animal agriculture in the United States was estimated to have a $252 billion impact on total output in the economy in 2009.

Section 18 of HSPD9 states:

“The Secretary of Agriculture, in coordination with the Secretary of Homeland Security, and in consultation with the Secretary of Health and Human Services and the Administrator of the Environmental Protection Agency, shall work with State and local governments and the private sector to develop:

(a) A National Veterinary Stockpile (NVS) containing sufficient amounts of animal vaccine, antiviral, or therapeutic products to appropriately respond to the most damaging animal diseases affecting human health and the economy and that will be capable of deployment within 24 hours of an outbreak. The NVS shall leverage where appropriate the mechanisms and infrastructure that have been developed for the management, storage, and distribution of the Strategic National Stockpile.”

It is crucial to national defense that the National Veterinary Stockpile be funded at an adequate level to carry out its mandate in HSPD9 to protect human health and the economy.

RESOLUTION:

The United States Animal Health Association requests that the President include in his budget, the Secretary of Agriculture support, and that Congress appropriate, funding of the National Veterinary Stockpile sufficient to carry out Homeland Security Presidential Directive 9 (HSPD-9) in protecting human health and the economy.

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RESOLUTION NUMBER: 37 -- APPROVED

SOURCE: COMMITTEE ON TUBERCULOSIS

SUBJECT MATTER: AMENDMENT TO TUBERCULOSIS UNIFORM METHODS AND RULES IN RELATION TO QUARANTINE RELEASE PROCEDURES FOR TB-INFECTED HERDS

BACKGROUND INFORMATION:

The Tuberculosis Uniform Methods and Rules (TB UMR) contains sections that provide specific requirements that must be met prior to releasing TB-infected herds from quarantine. These requirements are fairly prescriptive, and do not allow sufficient flexibility in those cases where the initial herd prevalence is low and infection may be removed from the herd using a battery of tests over a shorter period of time than that now provided for in the current TB UMR. Use of a model recently developed by the United States Department of Agriculture, Animal and Plant Health Inspection Service provides an additional tool that can be incorporated into the quarantine-release herd plan for TB-infected herds that will predict the
number of negative herd tests that must be completed to reach 95% confidence that no further infection remains in the herd.

**RESOLUTION:**

The United States Animal Health Association requests that the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services amend the Tuberculosis Uniform Methods and Rules or include language within the Program Standards that will allow state animal health officials the option to use the USDA-APHIS model as part of the herd plan to determine the number of negative herd tests that must be completed prior to releasing the herd quarantine.

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**RESOLUTION NUMBER: 38 -- APPROVED**

**SOURCE:** COMMITTEE ON TUBERCULOSIS

**SUBJECT MATTER:** APPROVAL OF THE CERVIDTB STAT-PAK AS AN OFFICIAL TEST FOR THE CERVID TUBERCULOSIS ERADICATION PROGRAM

**BACKGROUND INFORMATION:**

Infection with *Mycobacterium bovis* (M. bovis) continues to plague the United States cattle and cervid industries with a significant number of tuberculosis (TB) infected herds detected annually. During 2009-2011, TB strains were detected in cattle and captive cervid herds that were similar to strains from TB outbreaks in captive cervid herds found during the 1990’s. In all of these cases the approved Single Cervical Test has proven to be inadequate.

Advances in the science of TB testing have led to the development of antibody tests. The approval of antibody tests for farmed cervids would decrease the need for handling of these species, and would allow for increased interest in TB testing by producers. Blood-based antibody tests for use in cervid species would lead to increased participation of farmed herds in the TB eradication program.

At the 2006 United States Animal Health Association Annual Meeting, the following resolution was approved as Resolution 21: “The United States Animal Health Association (USAHA) recommends that the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) validate a serological tuberculosis test for captive cervids…”

At the 2007 USAHA Annual Meeting the following resolution was approved as Resolution 26: “The United States Animal Health Association (USAHA) urges the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) to expedite the validation
process for tuberculosis (TB) serological tests for cervids to enhance surveillance for TB."

The USAHA has recognized in recent years through discussion and these resolutions that many companies are generating promising data on antibody based TB diagnostic tests. Antibody-based tests have the potential to be more widely accepted by producers, due to reduced handling, and subsequent injury and death. Increased acceptance would in turn result in improved surveillance and herd management for bovine TB in captive cervids. Blood-based antibody tests represent viable alternatives to current TB test methods and many such tests have demonstrated promising results.

**RESOLUTION:**

The United States Animal Health Association requests that the United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services approve the CervidTB Stat-Pak as an official test in the Cervid Tuberculosis Eradication Program.

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RESOLUTION NUMBER: 39 Combined with 13

**SOURCE:** COMMITTEE ON TUBERCULOSIS

**SUBJECT MATTER:** A MULTI-STATE INITIATIVE FOR MYCOBACTERIAL DISEASES IN ANIMALS

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RESOLUTION NUMBER: 40 -- APPROVED

**SOURCE:** COMMITTEE ON SALMONELLA

**SUBJECT MATTER:** IDENTIFICATION OF FARM ENVIRONMENTAL PARAMETERS HOSTILE TO SALMONELLA

**BACKGROUND INFORMATION:**

The United States needs to expand on recent field and laboratory observations indicating that the presence and/or introduction of Salmonella organisms on production farms can be significantly suppressed by environmental parameters hostile to them. The further definition of these on-farm Salmonella-suppressive parameters, and development of ways to ensure their presence on a practical basis, represents a promising opportunity for improved on-farm reduction and control of Salmonella.

**RESOLUTION:**

The United States Animal Health Association urges the United States Department of Agriculture, Agricultural Research Service to establish project teams composed of epidemiologists, microbiologists, poultry and animal
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scientists and agricultural engineers in order to protect public health and food safety by identifying cost-effective ways to suppress Salmonella multiplication in the food animal environment, a problem that magnifies risk as animal products move forward to processing, distribution, marketing and consumption.
REPORT OF THE COMMITTEE ON PARASITIC DISEASES

Chair: Dee Ellis, TX
Vice Chair: David Winters, TX

Bob Bokma, MD; Corrie Brown, GA; Suzanne Burnham, TX; Matt Cochran, TX; Joseph Corn, GA; Lynn Creekmore, CO; Anita Edmondson, CA; Chester Gipson, MD; Thomas Hairgrove, TX; Jeffrey Hamer, PA; Larry Hawkins, MO; Linda Hickam, MO; Bob Hillman, ID; Thomas Holt, FL; Pamela Luisa Ibarra, DF; Ralph Knowles, FL; Charlotte Krugler, SC; Linda Logan, TX; David Marshall, NC; Terry McElwain, WA; Daniel Mead, GA; Ernie Morales, TX; Don Notter, KY; James Novy, TX; J. Mathews Pound, TX; Dale Preston, TX; Shawn Schafer, ND; Irene Schiller, CH; Jack Schlater, IA; Charly Seale, TX; Robert Stout, KY; Lee Ann Thomas, MD; Paul Ugstad, NC; Arnaldo Vaquer, VA; James Watson, MS.

The Committee met on October 5, 2011 at the Adam's Mark Hotel in Buffalo, New York, from 8:00 a.m. - 12:30 pm. There were 16 members and 23 guests present who signed the sign in sheet. Approximately 70 people attended all or part of the Committee and at one time there were 55 people in the room as counted by the chair.

The following presentations were given as part of the Committee meeting:

Exotic Arthropod Surveillance
Joe Corn, Southeastern Cooperative Wildlife Disease Study

Joe Corn of the Southeastern Cooperative Wildlife Disease Study (SCWDS), University of Georgia, Athens, Georgia, gave a report on SCWDS Exotic Arthropod Surveillance in the Southeastern United States. The SCWDS, in collaboration with the USDA-APHIS-VS, conducts surveys for exotic arthropods on free-ranging wildlife in the southeastern United States. Surveys are conducted via capture and examination of free-ranging wildlife. Examples of recent collections from native wildlife and free-ranging exotic reptiles included ticks, mites, and lice not previously reported in the United States. Additional examples were new host records for ticks and mites collected from established species of exotic reptiles. It is clear that a diversity of exotic ectoparasites is becoming established in Florida, and that new host-parasite relationships are developing among exotic and native ectoparasites, and exotic and native wildlife. Introductions of exotic arthropods have implications for domestic animal, wildlife, and human health, and early detection is critical to eradication.

Tropical Bont Tick in Caribbean
Joe Corn, Southeastern Cooperative Wildlife Disease Study
Joe Corn of the Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia-Athens, Georgia gave an update on the Tropical Bont Tick (TBT) in the Caribbean Region. The Caribbean Amblyomma Programme (CAP) ended in 2006 without accomplishing the goal of eradicating the tropical bont tick from the Caribbean region. Reasons for failure of the program included a lack of consistent funding and socio-economic problems related to tick eradication, animal husbandry and social issues in the affected countries. The tropical bont tick currently is reported with heavy infestations in Antigua, Guadeloupe and Marie Galante; moderate infestations in Dominica, Martinique, St. Kitts and Nevis, St. Lucia, and St. Marteen, and light, recent or sporadic infestations in St. Croix and St. Vincent and the Grenadines. Infestations do not occur in Anguilla, Barbados, Montserrat and Puerto Rico. The Caribbean Animal Health Network (CaribVET) has established a working group on Ticks and Tick-Borne Diseases which is to (1) provide regional expertise on ticks and tick-borne diseases; (2) develop harmonized regional disease surveillance and control protocols and strategies; (3) develop regional communication system and data management; (4) improve diagnostic capacities; and (5) define regional emergency plans. The CaribVET network is a collaboration of Caribbean countries and territories between Veterinary Services, diagnostic laboratories, research institutes, universities and regional and international organization, with the goal of improving animal and veterinary public health in the Caribbean region. The 2nd meeting of the CaribVET Ticks and Tick-Borne Diseases working group was held in St. Vincent and the Grenadines, June 7-9, 2011. Fourteen persons from Antigua, Cuba, Dominica, Guadeloupe, Martinique, Nevis, St. Croix, St. Kitts, St. Lucia, St. Vincent and the Grenadines, and the United States and the former FAO-CAP Coordinator attended the meeting. General recommendations were for the member countries to (1) develop guidelines describing how to manage outbreaks or new foci of TBT or dermatophilosis; (2) develop an improved sharing of results of the surveillance by former CAP countries and on surveillance protocols for TBT surveillance activities; (3) conduct a socio-economic study to improve the understanding of the constraints of appropriate treatment against ticks; and (4) further development of the detection and characterization of *Ehrlichia ruminantium* and *Amblyomma variegatum* and more generally develop the interaction between research and surveillance on TBT. Finally, the scope of the working group was broadened to deal with *Boophilus* sp. infestations and associated diseases because they represent major and/or increasing health issues in a number of Caribbean islands. Recommendations included the exploration of *Boophilus* resistance to acaricides; the further development of *Boophilus* transmitted diseases diagnostic and prevalence studies and the elaboration of guidelines for cattle breed management and import protocols to prevent clinical cases.
USDA-KBUSLIRL (ARS Kerrville) Research Update
Beto Perez de Leon, USDA-ARS

Beto Perez de Leon of USDA-ARS Knipling-Bushland U.S. Livestock Insects Research Laboratory (KBUSLIRL), Kerrville, Texas, gave a report on scientific activities at the USDA-ARS-KBUSLIRL. In addition to work done in Kerrville, efforts at the Cattle Fever Tick Research Laboratory (CFTRL), Edinburg, TX, and the Screwworm Research Laboratory in Pacora, Panama contribute to fulfill the USDA-ARS-KBUSLIRL research mission. The current five-year research cycle comprises four appropriated projects. Other projects established in collaboration with state, national, and international universities, regulatory agencies, and private organizations allow the USDA-ARS-KBUSLIRL to discover science-based solutions for the problems livestock producers and the public face with biting flies and ticks of veterinary and public health relevance. Results from research efforts meeting our project milestones yielded twenty-three scientific manuscripts in 2010 that were published in peer-reviewed journals. The initial evaluation of an ivermectin-mediated protein feed supplement block for cattle as a free-access, passive, self-treatment technology to eradicate cattle fever ticks was completed at the USDA-ARS CFTRL. Efforts are underway to initiate pilot testing of this technology in the permanent quarantine zone operated by the Cattle Fever Tick Eradication Program. Stall tests conducted at the USDA-ARS CFTRL revealed that a Bm86-based anti-tick vaccine commercially available outside the U.S. was highly (>95%) efficacious against a Texas outbreak strain of the cattle fever tick, *R. annulatus*. However, the level of efficacy reached against an outbreak strain of the southern cattle tick, *R. microplus*, was statistically insignificant. The USDA-ARS KBUSLIRL anti-tick vaccine discovery research program is addressing this technology gap. Investigators continued to collaborate with colleagues from Texas A&M University-Kingsville, Animal Plant and Health Inspection Service (APHIS)-Veterinary Services, and APHIS-Wildlife Services on the project “Integration of ecologically-based approaches to re-eradicate cattle fever ticks from the U.S.” funded by the National Institute for Food and Agriculture (project no.: TEXR-2009-05759). Visitation and access to field stations, established using the Thunder Valley Deer Feeder with ARS ‘2-Poster’ treatment adapter, by the white-tailed deer population were found to be dynamic processes. A correlation was found between the use of remote sensing technology to identify favorable white-tailed deer habitat and the ability to sample *R. microplus* larvae in the field. Scientists at the lab in Kerrville evaluated a novel treatment method for horn fly control consisting of a pressure driven launcher and an encapsulated insecticide formulation. This innovative remote delivery system to treat horn flies infesting cattle provided significant control for 3 weeks under field conditions. Efforts to develop a transgenic New World screwworm strain continue to be on target. The stable germ-line transformation of the New World screwworm was achieved by electroporation.
Tick Surveillance
Jack Schlater, USDA-APHIS-VS-NVSL

Jack Schlater presented a history of tick surveillance by the USDA. Tick surveillance was traced from its beginnings in the 1890's to the present and included the agencies, programs, and personnel involved in carrying out these activities. The number of collections and their importance was briefly discussed.

Tick Geodatabase/Distribution Data
Ryan Miller – USDA-APHIS-VS-CEAH

Ryan Miller of CEAH gave a presentation on their geodatabase creation. Because ticks are important vectors of pathogens, knowledge of the geographic distribution of ticks and tick-borne pathogens in the United States is important in developing appropriate targeted surveillance and disease mitigation strategies. Veterinary Services is using a GIS-based framework to integrate tick surveillance data from a variety of data sources into a single geodatabase design. The newly designed tick geodatabase is being used to develop county-level distribution risk maps for tick species of veterinary importance, which will be placed onto the Web when available.

Texas Cattle Fever Tick Program
Kevin Varner, USDA-APHIS-VS

Kevin Varner of USDA-VS Texas gave a presentation on the Texas Fever Tick Program. At the start of FY 2011 Texas was maintaining three “Blanket” Quarantine Zones in Free areas of Texas. These consisted of the Carrizo Springs Q Zone of 180,000 acres, the “Southern” Q Zone of 423,510 acres and the Olmal Q Zone of 152,716 acres. During the course of the Federal Fiscal year the Olmal, Carrizo Springs and most of the Southern blankets were released. By September 30, 2011 only the Starr County portion the “Southern” Blanket remained under quarantine- approximately 140,000 acres.

In FY 2011 the Cattle Fever Tick Eradication Program (CFTEP) identified 109 total infested premises. Seventy-six of these were located in the systematic zone and 33 were located in the Free area. This number continues at historically high levels and compares to a finding of 107 infested premises (71 systematic / 36 free) during the previous fiscal year.

Most of the FY 2011 infestations are found in two counties, Zapata (49 systematic / 14 free) and Starr (10 systematic / 18 free).

Deer Feeding
Between Feb. 1, 2011, and July 31, 2011, the CFTEP fed 1,320,000 pounds of ivermectin treated corn to deer on infested pastures. During the remaining months, 665,625 pounds of untreated corn was fed on those same premises. During this period the corn feeders were equipped with permethrin treated rollers.
During FY 2011 the CFTEP began a concerted effort to measure the efficacy of the deer treatment program. Multiple deer captures were conducted and they showed a reduction in the number of fever ticks found on the animals. Preliminary analysis can only say that the ivermectin-treated corn appears to reduce the number of fever ticks found on deer in the target zones.

The CFTEP has identified infested pastures with unprecedented populations of deer (up to one deer per four acres). The program views this as the greatest threat to the success of the program. To address this issue the CFTEP has signed a Cooperative Agreement with Texas A&M at Kingsville to develop deer management plans for landowners in the Systematic zone of Zapata County. This is a voluntary program that will offer the expertise of Texas A&M staff to consult one on one with interested landowners.

**Vaccine**

The Texas Animal Health Commission purchased a Cuban tick vaccine called Gavac. This vaccine underwent ARS trials and was shown to be effective against R. annulatus. The CFTEP is seeking approval from APHIS-CVB and FSIS to conduct field trials.

The “vaccine vision” of the program is to build a barrier of resistant cattle in the systematic zone. The initial focus will be to target cattle north of Laredo where the R. annuallatus tick is found.

Texas Department of Agriculture and Texas Animal Health Commission (TAHC) have made funds available to assist ARS with their vaccine development efforts, to buy cattle handling equipment and to buy more vaccine. Either Gavac (if it is approved for use by CVB and FSIS) or a vaccine produced by a major pharmaceutical company, are options for additional vaccine purchase.

**Ivermectin Tubs**

The CFTEP is working with TAHC, a private manufacturer and FDA to conduct field trials on an ivermectin tub product. This product holds the promise to dramatically change how the program manages infested pastures. Use of this product will encourage the retention of cattle on infested pastures by dramatically lowering the need to gather cattle for scratching and periodic treatment. Two pastures have been identified: one with annulatus and one with microplus ticks.

**U.S. Cattle Fever Tick Program**

Matt Messenger, USDA-APHIS-VS

Dr. Matthew Messenger, U.S. Department of Agriculture’s Animal and Plant Health Inspection Service, gave an update on the Environmental Impact Statement (EIS) for the Tick Control Barrier, which involves providing funding towards the installation of game fencing along portions of the Permanent Tick Eradication Line to limit the free-ranging movement of tick-infested white-tailed deer and other deer species into tick-free areas of south Texas. Public scoping meetings were held in March 2011 in four different
locations, and a general summary of the public comments were posted on the Tick Control Barrier’s webpage. The next steps involve drafting the EIS document and surveying proposed fencing locations.

In addition, an update on the potential recognition of two Mexican States (Sonora and Baja California) as being free of cattle fever ticks was given during the presentation. Site visits were conducted to review each state’s tick eradication program, and risk assessments are currently being finalized. The timeframe for the process of potentially recognizing each state as being free of cattle fever ticks will require at least two years. Finally, the Mexican State of Chihuahua has requested a site visit to review their tick eradication program, and a review is tentatively planned during fall 2011 or spring 2012.

**TAMU Tick App for Texas and Southern U.S.**
Pete Teel, Texas A&M University

Pete Teel of Texas A&M University gave a presentation on the newly created web-based tick application. The introduction and growth of smart phones that receive and search multitudes of web-based data through search engines and the corresponding development of application called “Apps” present opportunities to provide educational information and applications in new formats and to almost any location and clientele. A mobile, smart phone “App” has been authored and developed by Texas AgriLife Research and Extension with support from the Southern Region IPM Center entitled “The Tick App for Texas and the Southern Region”. The app is designed to respond to a wide array of citizen consumers and practitioners of several professions who desire a simple tool to identify commonly encountered ticks found in the region and access basic information about biology, pathogen associations, prevention, control and management. Smart phones and other similar devices provide a convenient method to access information quickly in a home or field setting, or in a clinical or client-based setting. An interactive demonstration of “The Tick App” with the conference audience will link integrated interests impacting humans, livestock, companion animals, and wildlife.

**Tick Acaracides**
Matt Messenger, USDA-APHIS-VS

Matt Messenger gave a brief overview on the history of the use of acaracides in the fever tick program for the last 100 years. Discussion on the currently available pesticides and resistance to the same was also presented.

**U.S. National Equine Piroplasmosis (EP) Update**
Angela Pelzel, USDA-APHIS-VS

Dr. Angela Pelzel, Regional Epidemiologist with USDA-APHIS-Veterinary Services, gave an update on the equine piroplasmosis response in the United States. Subsequent to the 2009-2010 outbreak of equine
piroplasmosis caused by *Babesia equi* on a ranch in Texas, enhanced surveillance and movement testing for EP in the U.S. identified additional EP-positive horses unrelated to the Texas outbreak. These newly identified non-clinical cases have been horses either imported to the U.S. prior to 2005 or individual EP-positives found within the racing industry, mostly in Quarter Horse racehorses. Epidemiological investigation into these cases indicates that spread of EP in the racehorse population is occurring via iatrogenic transmission. Dr. Pelzel's presentation covered a short review of the 2009-2010 Texas ranch outbreak, an update on the epidemiology of additional EP-positive findings unrelated to the Texas outbreak, and current management, outreach, surveillance and research initiatives, including preliminary results of the USDA-APHIS-VS and USDA-ARS treatment research program for EP-infected horses. Key messages from the presentation were: 1) Limited cases of equine piroplasmosis have been identified in three distinct populations in the U.S. - an index ranch in Texas, the racing industry, and previously imported horses. 2) EP transmission via iatrogenic means is causing ongoing transmission in the U.S. racing industry. Surveillance and educational outreach may be the most effective way to mitigate iatrogenic spread of EP within this population. 3) Preliminary results from the USDA-ARS research treatment program indicate that treatment using a high-dose imidocarb protocol may be a promising exit strategy for clearance of infection. EP is a regulatory disease in the U.S., therefore treatment of infected horses must be done with state/federal approval and regulatory oversight.

**Texas Piroplasmosis Program**

Andy Schwartz, Texas Animal Health Commission

Andy Schwartz presented an update on equine piroplasmosis activities underway in Texas. The investigation of a south Texas index case of Equine Piroplasmosis (EP), initiated in October 2009, was completed over one year ago. No additional related cases have been disclosed since, helping to confirm that the investigation and tracing of exposed horses was thorough and effective. Affected horses not euthanized are being held under quarantine. Use of these animals is allowed on the quarantine premises only. Treatment studies are ongoing, using the ARS recommended protocol. Results of the treatment are very promising.

From October 2009 through June 2011, more than 30,000 Texas horses were tested for EP. Most of these tests were for movement interstate or to events. The test positive prevalence in these horses is approximately 0.25%, excluding testing associated with the index ranch investigation. The national test prevalence during this same time period was approximately 0.13%, based on information provided in the National EP Situation Report.

In Texas, EP affected horses fall into three categories: Index case associated, international imports on the CF test, and Quarter Horse racehorses. Almost all cases disclosed in Texas over the past year were in
the QH racehorse population. Disease spread among this population is thought to be iatrogenic.

To address the QH racehorse situation, the Texas Animal Health Commission (TAHC) passed rules earlier this year requiring a 12 month EP test to enter racetracks, and requiring all EP tests be done on a TAHC test record.

A resolution was passed at the USAHA 2010 Annual Meeting requesting information on horses imported into the U.S. during 1995–2005, on the CF test. Records show approximately 9,000 horses entered Texas during this time. Efforts are underway to contact owners of these horses imported in 2005, offering a test at no cost. Results of this effort will be used to gauge additional tracing and contacts.

Committee Business

There were no sub-committee reports, no press releases and no resolutions created. There was one recommendation passed from the Committee for consideration and possible forwarding to USDA-APHIS-VS-CEAH as follows:

**Committee Recommendation:**

**Background:** In 2009, 75% of the 400 plus horses located on a large ranch in south Texas were found to be infected with equine piroplasmosis (EP). EP is considered to be a foreign animal disease to the United States. Tick transmission was determined to be the primary factor in the spread of the disease between horses on the ranch. For the first time, the tick *Amblyomma cajennense* was determined to be a capable vector for transmission, and is believed to be the primary tick species responsible for spread within the ranch. The natural range and distribution of this tick outside of south Texas and within the United States is not clearly defined at this time.

**Recommendation:** The USAHA Committee on Parasitic Diseases recommends that USDA-APHIS-VS-CEAH National Center for Risk Analysis conduct a risk assessment on the potential for *Amblyomma cajennense* to be transported via livestock or wildlife from Texas to other states. The Committee further recommends that CEAH determine the natural range and current known locations of this tick species.
COMMITTEE ON PHARMACEUTICALS

Chair: Christine Hoang, IL
Vice Chair: Ellen Wilson, CA

James Bradford, MI; Tom Burkgren, IA; Steven Clark, NC; Stephen Crawford, NH; Ozlem Ersin, MN; William Fales, MO; Timothy Goldsmith, MN; Larry Hawkins, MO; Rick Hill, IA; Donald Hoenig, ME; Bruce King, UT; Jennifer Koeman, IA; Patrick McDonough, NY; James McKean, IA; James McKean, IA; Ron Phillips, MD; M. Gatz Riddell, Jr., AL; A. David Scarfe, IL; Mike Senn, KS; Ashley Shelton, DC; Paul Sundberg, IA; R. Flint Taylor, NM; Liz Wagstrom, DC; Ching-Ching Wu, IN.

The Committee met on Oct. 4, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 8 a.m. to 12 p.m. There were nine members and six guests present.

Veterinary Feed Directive Update
Dr. Tom Burkgren, American Association of Swine Veterinarians (AASV)

The Veterinary Feed Directive (VFD) became available as a part of the Animal Drug Availability Act of 1996. Regulations were developed for the VFD and the first VFD drug, Pulmotil®, was approved for use in swine in 2001. The second VFD drug to be approved was also for swine, Nuflor® in 2006. In 2010, the FDA issued an Advance Notice of Proposed Rulemaking for VFDs regarding the following topic areas: Conditions met by veterinarian; Disposition of original VFD & copies; Records; Notification requirements; Additional recordkeeping (distributors); Cautionary statements; and Others. Some concerns with the VFD process if there are more VFD products (for example over-the-counter (OTC) feed products becoming VFD) include concerns with inexperience with the VFD considering that there are currently only 2 products approved as VFD; a lack of infrastructure; logistical challenges if too much is implemented too quickly. Furthermore, there may be marketplace disruptions considering the source of some current medicated antimicrobials feed sources – distributors, on-farm mixers, and existing supplies of feeds. Other items under discussion include the specifics of VFD forms: not Part 11 compliant; a desire of acceptance of faxed forms, dose & duration (not quantity of feed) on the form (e.g. 10mg/kg daily for 5 days), time limitation (< 12 mos.), paperwork retention for 1 year (including electronic or non-paper versions), removing Veterinarian-Client-Patient Relationship (VCPR) requirement, Category I & II medicated feeds. Another proposed rule on the VFDs is likely pending in October.

Bovine Practitioners Situation Overview
Dr. Gatz Riddell, American Association of Bovine Practitioners (AABP)

In the early 2000s, rural practitioners were having trouble hiring new graduates. The Food Supply Veterinary Medicine Coalition marketing study
showed supply over demand shortfall of about 4%. Following that, significant efforts by veterinary community to encourage students to consider rural practice was highly successful. Yet beginning in about 2008-2009, there began to be reports that graduating veterinarians interested in rural practices could not find jobs. The question began to be asked, why the reversal? AABP considered what the issues were. What are the issues? Rural economies are struggling. There is an economic downturn. Milk prices have dropped precipitously. There is a high student debt to salary ratio. Business models are outdated and there are gender/generational/lifestyle issues. There is also a consolidation of animal agriculture as well as impacts of challenges to state practice acts where non-veterinarians are performing procedures traditionally performed by veterinarians. Is there a shortage of veterinarians? Yes and no depending on the definition. It’s not strictly food animal. It’s likely rural practice which does some food animal.

In Fall 2010, American Association of Bovine Practitioners - Ad Hoc Committee on Rural Veterinary Practice was formed and a summary opinion issued in May 2011 directed at enlarging veterinary school class sizes and new veterinary schools in planning stages. It is not inconsistent with the Veterinary Medical Loan Repayment Program (VMLRP) and VSIA. The conclusion: There is no supply shortage. We have enough veterinarians interested in food animal and rural practices. But, there are still underserved areas! The implications of that conclusion are that there still needs to be protection of the national cattle herds in terms of foreign animal diseases (FADs) and emerging/re-emerging diseases. The public wants veterinarians involved in food safety and animal welfare, especially with antimicrobial use and veterinary oversight as well as animal welfare oversight. The Food and Drug Administration (FDA) is in the process of mandating more veterinary oversight of drugs with perhaps all antimicrobials being RX/VFD and no OTC. It could affect availability of veterinarians at a time when they may be wanted or required more. Future steps for AABP include the Veterinary Practice Sustainability Project. The AABP recognizes that the veterinary profession has issues to solve, including the salary to debt ratio, the sustainable business models. The days of James Herriot are gone and it may be necessary to incorporate veterinary technicians in extending veterinary services. The profession and the industries need to understand this is a joint problem.

Communities may have to get involved in securing health care services.

Management of Boar Taint: Immunological Alternative to Physical Castration
Dr. John Crane, Pfizer Animal Health

An overview of Anti-GnRF technology consisting of its history and uses was given as an introduction to the topic. Additional information on the background of boar taint, followed by the detailed specifics of immunological mode of action, efficacy (chemical and sensory studies), human food safety,
USDA classification, and QA process was also provided as part of the scientific presentation.

Committee Business

No official Committee business was conducted due to lack of a quorum.
REPORT OF THE COMMITTEE ON PROGRAM

Chair: David Marshall, NC

Lisa Becton, IA; Richard Breitmeyer, CA; Charles Brown, II, WI; Bonnie Buntain, AB; Stephen Crawford, NH; William Edmiston Jr. DVM, TX; Dee Ellis, TX; Francois Elvinger, VA; James Evermann, WA; Tony Forshey, OH; W. Kent Fowler, CA; Paul Gibbs, FL; Michael Gilsdorf, MD; Gail Golab, IL; Andrew Goodwin, AR; Steven Halstead, MI; William Hartmann, MN; Julie Helm, SC; Christine Hoang, IL; Donald Hoenig, ME; Jim Logan, WY; N James Maclachlan, CA; David Meeker, VA; Michele Miller, FL; Sandra Norman, IN; Gary Osweller, IA; Charles Palmer, CA; Elisabeth Patton, WI; Bob Pitts, GA; Barbara Powers, CO; Wilson Rumbeia, MI; Stephen Schmitt, MI; Marilyn Simunich, ID; Kevin Snevkik, WA; Harry Snelson, NC; Nick Striegel, CO; Doug Waltman, GA; David Zeman, SD.

The Committee met on Saturday, October 1 at the Buffalo Adam’s Mark Hotel at 6:00 p.m. There were 29 members and staff were present. Chair David Marshall called the meeting to order. Each member introduced themselves.

Ben Richey provided an invocation, and dinner was served.

Procedures for Committee meetings was presented by Marshall. He covered the Manual of Operating Procedures for Committee Chairs and Committees, Robert’s Rules of Order, Quorum for Committee Meetings, voting and use of proxies, substitutions and mission statements.

Richard Breitmeyer, chair of the Committee on Nominations and Resolutions, reviewed the resolution process, reminding chairs to keep resolutions succinct and direct. He also discussed joint resolutions that would be taken on by AAVLD and USAHA in their respective membership meetings.

Steve Crawford, invited all chairs to be thinking of priority issues for the Committee on Government Relations that will be held sometime in March. He also encouraged all chairs to attend. It was suggested that staff work with the resolution process to have responses in advance of the Government Relations meeting to allow time for review and prepare any additional concerns.

Ben Richey provided a summary for committee reports, encouraging chairs to use the template and ensure they are to the workroom no later than 24 hours after their meeting. Chairs were encouraged to collect summaries from their speakers whenever possible. He highlighted the business portion of the report for its importance, that the board of directors does approve the reports and all actions of the committee. The workroom is in the Richardson
REPORT OF THE COMMITTEE

Room, with staff available to assist with preparations of agendas, presentations, resolutions and reports.

Richey reminded all chairs about security, and process if issues were to arise.

David Marshall reviewed the coming year goals to work towards a more structured resolutions tracking and reporting process, to better review responses and provide necessary follow up.

Marshall also noted that the Executive Committee would be reviewing the speaker compensation policy in the coming year. Conceptually, the EC would be willing to make some travel funding available to highly renowned speakers that may not otherwise come to the USAHA meeting.

There was a clarification on Time-Specific papers, that they do not necessarily need to be limited to 15 minutes. That would only apply to those presented in the scientific session hosted by AAVLD. The EC should review the committee guidance for this.

Marshall reviewed the OIE Commenting Process, noting the importance of this process and the timeliness of having comments made. Don Hoenig, as chair of the Committee on International Standards will coordinate distribution of the chapters for comment this year once distributed by USDA-APHIS.

The following chairs were recognized for their service as Committee Chairs:
   Dr. Francois Elvinger, Committee on Animal Health Surveillance and Information Systems
   Dr. Gary Osweiler, Committee on Environment and Toxicology

Some suggestions were provided regarding discussion on the 2012 Committee on Government Relations.

The process for chair succession was also clarified, that the president appoints those in consultation with the past chair. The Committee, however does not vote to appoint a chair.

With no further business, the meeting was adjourned.
The Committee met on Oct. 4, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 1:00 p.m. to 5:30 p.m. There were 28 members and 38 guests present. Dr. Norman welcomed Committee members and guests. She reviewed the Committee purpose and guidelines for conducting the meeting.

FDA Update on the Food Safety Modernization Act  
Dr. Burt Prichett, Food and Drug Administration (FDA), Center for Veterinary Medicine  

Dr. Pritchett gave an overview of the Food Safety Modernization Act (FSMA) and the timeline for publishing rulemaking to implement the new legislation. FSMA was passed by Congress in December 2010 and signed by the President on Jan. 4, 2011. It amended the Federal Food Drug and Cosmetic Act so it applies to FDA-regulated food (both human food and animal feed), but does not apply to food regulated by USDA under the Federal Meat Inspection Act, the Poultry Products Inspection Act, or the Egg Products Inspection Act.

One of the main goals of FSMA is to build more prevention into the manufacturing, processing, packing, and holding of food, rather than reacting to problems after they occur. FSMA also provides new tools for inspecting for industry compliance with food safety regulations, and for responding to food borne illness outbreaks, and incidents where potentially hazardous products enter commerce. The new legislation also addresses the safety of...
imported food. FSMA relies heavily on partnerships with state, local, and other federal agencies for the success of the new food safety system.

The statutory deadline for publishing final regulations that will require human food and animal food facilities to implement hazard analysis and risk-based preventive controls is July 3, 2012. This means that a proposed regulation needs to be published this October or November to allow time for public comment on the proposed requirements.

**USDA Swine Influenza Surveillance**

**Dr. Sabrina L. Swenson, USDA National Veterinary Services Laboratories**

Swine influenza primarily presents as a respiratory disease of swine manifested as elevated body temperature, coughing, sneezing, dyspnea, and/or nasal discharge. In many instances the disease is self-limiting with a high mortality rate and low morbidity rate. Secondary viral or bacterial infections may occur following infection with swine influenza virus (SIV).

Influenza viruses are ribonucleic acid (RNA) viruses and have segmented genomes. Prior to 1998, swine influenza in pigs was caused by H1N1 SIV, which is referred to as classical SIV. In 1998 it was recognized that a new virus had entered and become stable in U.S. swine population. This was a H3N2 virus referred to as a triple reassortant virus, as the virus was composed of genes from human isolates, isolates from avian species, and isolates from swine. Over time the H3N2 and H1N1 viruses underwent reassortment (swapped genes) resulting in new viruses such as H1N2 and H3N1. Changes in the hemagglutinin (H or HA) over time has resulted in the recognition of 4 distinct H1 types (alpha, beta, gamma, delta) in swine. As a result there are now multiple influenza subtypes being maintained in the U.S. swine population.

In 2008, the Centers for Disease Control and Prevention (CDC) and the United States Department of Agriculture (USDA) began exploring opportunities to implement SIV surveillance in swine to develop a better understanding of what viruses were circulating in the U.S. swine population. This collaboration occurred as a result of joint investigations between CDC and USDA into human infections with swine lineage influenza. In 2009, prior to implementation of the surveillance plan, pandemic H1N1 appeared in people and animals. As a result the basic plan developed by CDC and USDA was enhanced, and the surveillance testing was launched in May, 2009.

The surveillance effort was implemented through the National Animal Health Laboratory Network (NAHLN) that was already in place for testing for agriculturally important animal diseases. The NAHLN labs were provided with a polymerase chain reaction (PCR) procedure for detection of the matrix gene of influenza. The matrix assay was already being used for detection of avian influenza in the labs, but was modified to also detect the pandemic matrix. Labs were also provided with an N1 PCR procedure specific for the N1 that was unique to the pandemic influenza. The testing algorithm
involved screening for influenza using the matrix assay, followed by the N1 assay to determine if pandemic influenza was involved. Labs also conducted virus isolation and sequencing for the hemagglutinin, matrix, and neuraminidase genes. All viruses isolated are sent to the National Veterinary Services Laboratories (NVSL) for development of a swine influenza repository, and the genetic sequences of the three genes are deposited into GenBank, a publically available database.

Samples entering the surveillance system are on a voluntary basis and can enter through two streams, identified and anonymous. Under the identified stream, the producer and herd location are known by USDA. Under the anonymous stream, the producer is not known by USDA, and the herd location is only by state and not by specific address. Initial swine producer concerns and lack of participation led to implementation of the anonymous system in July 2010. Since then, numbers of samples entering the SIV surveillance system has been increasing. As a result, available sequence data in GenBank for U.S. swine have increased, and viruses have been arriving at NVSL for the repository. Data are now becoming available on the types of viruses identified as well as states in which those viruses are being found. The availability of a national repository of viruses and national data have been extremely helpful during recent investigations of suspected human infections with swine lineage influenza and in identifying development of new viruses as genes move from one virus to another.

One Health: the APHIS-VS Perspective and an Update on APHIS-VS Activities
Dr. John Clifford, USDA-APHIS-VS
Dr. Thomas Gomez, USDA-APHIS-VS

Within USDA-APHIS-Veterinary Services (VS) we’ve been talking for the past three years about the ever-changing landscape of animal agriculture and about the need for VS to adapt to better meet the needs of our partners in the States, Tribes, industries, and universities now and in the future. That has been the guiding principle of the organizational change effort we’ve been calling “VS2015” and is detailed in our document “Veterinary Services: A New Perspective”. In response to the most pressing needs of today, VS has identified a specific group of priority issues to be addressed in 2011 and 2012. These priorities include One Health and further integrating One Health activities into our daily work.

While the health of animals remains our primary focus, we are also aware of how the health of animals (including domestic and wild animals), the health of people, and the viability of our ecosystems are inextricably linked. As part of its vision now and for the future, VS is committed to embracing One Health as part of the solution to prevent and control diseases at the human, animal, and environmental interface. That is why VS is contributing its expertise, infrastructure, and systems to partnerships that
span counties, States, and countries to promote healthy animals, people and ecosystems.

To this end VS is implementing its “New Perspective” and “One Health Strategic Plan” which map out the future direction of VS. As part of implementing its “One Health Strategic Plan” VS is developing communications and training/education plans and an operational plan which will focus on two areas – determining VS’ role and activities in zoonotic diseases and pre-harvest food safety.

In conclusion, Veterinary Services will continue to broaden the scope of its mission to collaborate with one health partners to optimize human, animal, and environmental health.

The Raw Milk Movement, a Minnesota Perspective
Dr. Joni Scheftel, Minnesota Department of Health

Despite outbreaks and the fact that raw milk is a risky food, there are claims by some consumer groups that perceived benefits outweigh any risks. Related to this, there is a movement in the U.S. to relax regulations regarding sale of raw milk. During the 2010-2011 legislative season, raw milk bills were introduced in at least 10 states including Minnesota. Opposing these legislative efforts is made more difficult for health departments and regulators because of the misinformation regarding raw milk available to consumers on the internet and through other social media.

Outbreaks associated with raw milk occur frequently and receive media attention. However, only a minority of raw milk consumption-associated illnesses are part of recognized outbreaks. “Sporadic” cases of illness (those not associated with an outbreak) represent a much larger public health issue than outbreaks. In Minnesota, from 2001-2010, 518 of 13,222 persons with sporadic cases of enteric illnesses such as Campylobacter and Salmonella, reported drinking raw milk during the incubation period of their illnesses. During this same timeframe, five raw-milk associated outbreaks were identified, accounting for 23 cases. The number of laboratory-confirmed sporadic cases was 22 times the number of raw milk–associated outbreak cases. There is a significant burden of illness associated with raw milk consumption, disproportionally born by children, as 37% of sporadic cases in Minnesota are less than 10 years of age.

Q Fever
Dr. Lynn Creekmore, USDA APHIS VS

The recent, and historically large, outbreak of Q fever in the Netherlands has brought renewed attention to the presence of Coxiella burnetii in the U.S. and the question of whether such a large outbreak could occur in this country. Coxiella burnetii is a widespread, obligate intracellular gram negative bacterium for which the main reservoirs of infection for humans are cattle, sheep and goats. People are most often infected through aerosol transmission of the organism around the time of livestock parturition. The majority of studies in the U.S. have focused on dairy cattle (estimated
prevalence 78.6%), while the national prevalence in sheep and goats is unknown. There are variable state requirements to report Q fever, and there are variable state responses to positive herds or flocks with some quarantining while others cite the disease is endemic and don’t respond. The growing U.S. goat population, increase in new goat producers, and expanding human populations into previously rural areas along with heightened interest in lambing/kidding/calving at state and county fairs all escalate the risks for human exposure. Enhanced and consistent reporting along with uniform response to acute livestock infections nationally and improved understanding of the prevalence and epidemiology in small ruminants will ameliorate the situation. However, there is also a need for producer education and viable control options (such as vaccination) for producers who want to prevent or reduce the risks for Q fever in their herds or flocks.

**Update on the 2011 NASPHV Rabies Compendium**
Dr. Don Hoenig, State Veterinarian and State Public Health Veterinarian, Maine

Dr. Hoenig reviewed changes in the current Compendium for Animal Rabies Control. The new document was released in May 2011. Changes include a new case definition, clarification in the role of CDC, and statements about live animal testing. Additional research topics for further study are added and the list of approved rabies vaccines is updated.

**Evaluation of ONRAB® Oral Rabies Vaccine (Rabies Vaccine, Live Adenovirus Vector {AdRG1.3}) in Feral Dogs (Canis lupus familiaris)**
Dr. Scott Bender, Navajo Nation Department of Agriculture

ONRAB®, a human adenovirus rabies construct vaccine, has been used in extensive field trials in Canada for several years to determine the safety and efficacy of the vaccine in target species (striped skunk, raccoon, and red fox). These trials also determined that the most common non-target species that may ingest baits are dogs. In support of use of the vaccine in the United States, the Navajo Nation Veterinary Program, Navajo Nation Department of Agriculture, Navajo (First) Nation applied to the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Center for Veterinary Biologics for a research and evaluation permit to evaluate the safety of ONRAB® vaccine in feral dogs.

Twenty feral dogs, kept in isolation, were offered ONRAB® vaccine contained in "Ultralite" baits (Artemis Technologies Inc., Guelph, Ontario, Canada). General health status was monitored and sera collected at Day 0 and at 2 week intervals for the duration of the study, with seroconversion against HAd5 and rabies used to determine vaccine uptake. Oral swabs collected at 2, 12, and 24 hours post-bait consumption, and rectal swabs at 48 and 72 hours post-bait consumption were assayed for AdRG1.3 by Real Time Polymerase Chain Reaction (PCR) to evaluate potential environmental
virus shedding. Two human subjects (investigation veterinarian and one animal caretaker), two non-study, investigator-owned dogs and one unvaccinated control dog kept in intimate contact with four vaccinated dogs, were assessed pre- and post-study for HAd5 and rabies titers changes or seroconversion, to monitor for potential horizontal transmission. Canine Adenovirus type 2 titers were determined for potential interference with the AdRG1.3 vaccine. AdRG1.3 was titrated from one unused bait to assess any degradation due to shipping and storage of the vaccine during the study. Uptake of the ONRAB® vaccine by titer seroconversion or booster was observed in a majority of the dogs, with no adverse health affects from vaccination noted during the course of the study. Pre-existing CAV2 titers had no apparent effect on the AdRG1.3 seroconversions. While shedding was detected by the swabs, no indication of a horizontal transmission to humans, non-study dogs or the dog in intimate contact was observed. Shipment did not cause any detectable degradation in the returned unused bait.

No adverse affects were observed by the vaccination of dogs using ONRAB® oral Rabies vaccine. In conclusion, the ONRAB® AdRG1.3 vaccine results in this study show its potential as a viable Oral Rabies vaccine for use in the vaccination of feral dogs.

Spatially Explicit Capture Recapture Analysis of a Raccoon Density Index
Dr. Kurt VerKauteren, USDA-APHIS-WS

Dr. VerKauteren reviewed methodologies for estimating raccoon populations. Accurate estimates are desirable to best determine bait drop density for oral racies vaccination programs and for determining seroconversion rates after vaccination. A new model incorporates spatial data and yields higher density estimates compared to current methodologies.

Invitation and Highlights of the Rabies Symposium
Dr. Joanne Maki, Merial

Dr. Maki stressed the global importance of rabies. She provided a review of the Rabies Symposium being held on October 5, 2011 and encouraged attendance. She also reminded people of the One Health luncheon following the symposium and encouraged attendance.

Committee Business

The Committee had one Recommendation: The Committee recommends that a One Health based symposium be held again next year. The symposium would be similar to the Rabies Symposium held this year, but on a different topic. The Committee believes this is an effective means to provide an opportunity for in-depth discussion on a topic and to encourage participation of the public health community.

The Committee passed two resolutions, which were forwarded to the Committee on Nominations and Resolutions.
COMMITTEE ON SALMONELLA

Chair: Doug Waltman, GA
Vice Chair: Richard Sellers, VA

Deanna Baldwin, MD; Marilyn Balmer, MD; Richard Breitmeyer, CA; Paul Brennan, IN; Jones Bryan, SC; Tony Caver, SC; Kevin Custer, IA; Sherrill Davison, PA; Tracy DuVernoy, MD; John Enck, PA; Paula Fedorka-Cray, GA; James Foppoli, HI; Rose Foster, MO; Tony Frazier, AL; Richard Gast, GA; Eric Gingerich, IN; Jean Guard, GA; Carl Heeder, MN; Rudolf Hein, DE; Julie Helm, SC; Bill Hewat, AR; Danny Hughes, AR; Deirdre Johnson, MN; Barry Kelly, CA; Hailu Kinde, CA; Jennifer Koeman, IA; Elizabeth Krushinskie, DE; Dale Lauer, MN; Elizabeth Lautner, IA; Tsang Long Lin, IN; Howard Magwire, MD; Edward Mallinson, MD; Beth Mamer, ID; Sarah Mason, NC; Patrick McDonough, NY; James McKean, IA; Hugo Medina, MN; David Meeker, VA; Sarah Mize, CA; Thomas Myers, DC; Kakambi Nagaraja, MN; Steven Olson, MN; Claudia Osorio, MD; Shelley Rankin, PA; Sebastian Reist, NJ; C. Stephen Roney, GA; John Sanders, WV; H. Shivaprasad, CA; Bruce Stewart-Brown, MD; Hilary Thesmar, DC; Belinda Thompson, NY; Bob Tully, KS; Liz Wagstrom, DC; Scott Wells, MN; Dennis Wilson, CA; Nora Wineland, MO; Ching-Ching Wu, IN.

The Committee met on Oct. 4, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 8:00 a.m. to 12:00 p.m. There were 18 members and 28 guests present. After the Chair opened the meeting and welcomed the attendees he introduced himself and the Vice Chair, since both were new. He recognized the faithful service of Pat McDonough who served as Chair for the last 5 years. He reminded those present to sign the attendance sheets and if a member to check to see that their contact information was correct and if they were not members to indicate if they would like to become a member of the Committee. The Chair briefly overviewed the requirements of becoming a member and that only members could propose resolutions and recommendations and vote. However, everyone was encouraged to participate in the discussion.

CDC Update on Salmonella Surveillance
Dana Cole, DVM, PhD, Division of Foodborne, Waterborne, and Environmental Diseases, U.S. Centers for Disease Control and Prevention

Dr. Cole gave the Centers for Disease Control (CDC) update focusing on 4 areas: the estimated burden of Salmonella, isolate-based surveillance, outbreak-based surveillance, and foodborne disease attribution.

Each year there is an estimated 1.2 million illnesses in the United States due to Salmonella and of those there are 19,336 hospitalizations and 378 deaths. Within the surveillance systems the isolate-based systems is the most complex, comprising the laboratory-based enteric disease surveillance (LEDS), Foodborne Diseases Active Surveillance Network (FOODNET), and
National Antimicrobial Resistance Monitoring System (NARMS). The LEDS system, also called the National Salmonella Surveillance System, was established in 1990 to collect data directly from state public health laboratories. These laboratories report isolation of nationally reportable pathogens. For example under this surveillance, the isolation rate of Salmonella for 2008 and 2009 were 15.4/100,000 and 13.2/100,000, respectively. The 10 most frequently reported human Salmonella serotypes for the year 2009 were: enteritidis (17%), typhimurium (15%), newport (9.3%), javiana (4.9%), heidelberg (3.5%), montevideo, O4,(5),12:1:--, oranienburg, saintpaul, and muenchen. Additional information from the LEDS system may be found at the following web site http://www.cdc.gov/ncezid/dfwed/edeb/publications.html.

Another of the isolate-based surveillance systems is FOODNET. This system was established in 1996 to provide active surveillance for 11 pathogens commonly transmitted through food. It is comprised of CDC, USDA, FDA, and 10 participating state health departments. Overall it represents about 15% of the U.S. population pulling data from 650 clinical laboratories. FOODNET data shows an increase of laboratory confirmed Salmonella cases over 2006-2008. The incidence is highest in children (69.5 infections/100,000 children). The following Table shows the relationship between the number of Salmonella infections that are outbreak related or sporadic.

<table>
<thead>
<tr>
<th>Year</th>
<th>Outbreak related</th>
<th>Total reported</th>
<th>% cases related to outbreak</th>
<th>Rate (cases/100,000)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>All</td>
</tr>
<tr>
<td>2006</td>
<td>478</td>
<td>6,689</td>
<td>7.1</td>
<td>14.73</td>
</tr>
<tr>
<td>2007</td>
<td>416</td>
<td>6,828</td>
<td>6.1</td>
<td>14.86</td>
</tr>
<tr>
<td>2008</td>
<td>584</td>
<td>7,457</td>
<td>7.8</td>
<td>16.07</td>
</tr>
<tr>
<td>2009</td>
<td>376</td>
<td>7,023</td>
<td>5.4</td>
<td>14.99</td>
</tr>
<tr>
<td>2010</td>
<td>418</td>
<td>8,275</td>
<td>5.1</td>
<td>17.66</td>
</tr>
</tbody>
</table>

The data show that almost 95% of all Salmonella infections are not outbreak related. That means that the vast majority of Salmonella infections are outside our systems to track and investigate. The Top 10 Salmonella serotypes for 2010 within FOODNET includes: enteritidis, newport, typhimurium, javiana, O4(5),12:1:--, heidelberg, saintpaul, muenchen, montevideo, and infantis.

The third system within the LEDS is the National Antimicrobial Resistance Monitoring System (NARMS). NARMS receives Salmonella isolates from humans through CDC, Salmonella isolates from animals from...
USDA-FSIS, and *Salmonella* isolates from retail meats from FDA/Center for Veterinary Medicine (CVM). The objectives of NARMS are to: 1) monitor trends in antimicrobial resistance among foodborne bacteria from humans, animals and retail meats, 2) disseminate timely information on antimicrobial resistance to promote interventions that reduce resistance among foodborne bacteria, 3) conduct research to better understand the emergence, persistence, and spread of antimicrobial resistance, and 4) provide data that assist the FDA in making decisions related to the approval of safe and effective antimicrobial drugs for animals. There have been studies that have shown that multidrug resistant strains have increased morbidity and mortality and seem to have increased virulence.

In 2010, 85% of *Salmonella* isolates were pan-susceptible. For the past several years the percentage of isolates that are resistant to ≥3 or ≥5 antimicrobial classes have been declining. Of those serotypes that are resistant to ≥3 antimicrobial classes the top 3 serotypes are *typhimurium*, *heidelberg*, and *newport*, with *typhimurium* making up about 50% of the isolates. A closer look at the source of these resistant isolates show that isolates from humans are 10% resistant, while those from retail meats (chicken breasts, 48% and ground turkey, 26%) and food animals (chickens, 16%, turkeys, 33%, cattle, 26%, and swine, 32%) were higher. Also among the MDR isolates are the ones resistant to ampicillin, chloramphenicol, streptomycin, sulfonamide, and tetracycline commonly referred to as ACSSuT. The number of isolates with this MDR pattern, which primarily consists of *typhimurium* and *newport*, is also declining. Another common pattern is the ACSSuT plus resistance to amoxicillin-clavulanic acid and ceftriaxone. *Salmonella* with this pattern are also declining.

Further information can be obtained from www.cdc.gov/narms.

The other surveillance system is CDC’s Outbreak Surveillance System. This supports a national network of epidemiologists and other public health officials who investigate outbreaks of foodborne, waterborne, and other enteric illnesses. It represents collaboration between CDC and the U.S. state and local health departments, the USDA, and FDA. It also works closely with PulseNet (national molecular subtyping network for foodborne disease surveillance). Outbreak surveillance provides one of the best sources of information on foods that cause foodborne illness. Individual investigations can provide insight into the mechanisms of contamination, possible control measures to prevent future illnesses, and to identify gaps in our food safety system. From 1998-2008 about 25% of all foodborne outbreaks were caused by *Salmonella* and about 1/3 of those were due to *enteritidis*. *Salmonella* is second to Norovirus in number of outbreaks, but is responsible for more hospitalizations and death. Only a small proportion of the outbreaks can be identified by specific food source, but of the ones that have a known source 47% of the outbreaks are due to poultry and eggs.

A listing of the multistate outbreaks for 2011 may be found at www.cdc.gov/salmonella/outbreaks.html.
The ones involving *Salmonella* include: ground turkey (*heidelberg*), imported papayas (*agona*), African dwarf frogs (*typhimurium*), sprouts (*enteritidis*), chicks and ducklings (*altena* and *johannesburg*), microbiology labs (*typhimurium*), turkey burgers (*hadar*), and cantaloupe (*panama*).

Lastly, foodborne disease attribution has high priority across federal agencies as there is a great need to understand what foods are contributing to the most illnesses. Attribution data help target interventions, help to measure progress toward goals, and assist in decision making.

**FDA Egg Rule Inspections Update**

Bruce Cooper, Consumer Safety Officer, FDA, New York District, Syracuse, NY is an instructor for the FDA Egg Safety Inspection Training Course and lead investigator on inspections in the Northeast district. To date there have been 2 assignments which are described in the websites below:


The FY10 assignment was from September 20, 2010 to December 31, 2010 and involved 35 locations representing 9 companies in 6 states. Farms were selected for inspections based on being implicated in past outbreaks, being a larger producer, or having a history of sanitation issues. All of these inspections were comprehensive meaning that environmental samples were collected for *Salmonella* isolation. The FY 11 assignment is ongoing and uses a risk assessment tool to categorize farms for inspection. The agency has a goal to inspect 600 farms by the end of the year. There are 2 types of inspections. Targeted inspections, which make up the majority of inspections, consist of a review of records and a walk through the houses. This inspection does not include environmental sampling. The objective of the inspection is to determine if the farm has implemented the controls necessary to comply with the FDA Egg Rule. Comprehensive inspections are targeted inspections plus environmental sampling. If during a targeted inspection there is evidence that the Egg Rule is not being substantially followed, the inspectors may collect samples for *Salmonella* testing.

The target inspections review the *Salmonella enteritidis* SE prevention plan to assure it includes the following components: 1) procurement of SE monitored pullets, 2) biosecurity measures, 3) rodent/pest control measures, 4) cleaning and disinfection measures, 5) adequate refrigeration of shell eggs, and 6) environmental and egg sampling program. Some of the significant deviations that have been found include: a) failure to include the above components into a SE prevention plan, b) failure to test the environmental at required time periods, c) failure to divert eggs or begin egg testing after a positive environmental sample, d) failure to implement the SE prevention plan, e) failure to maintain records documenting their SE plan implementation, and f) failure to monitor conditions required for implementation.
The possible outcomes of the inspection include a close out meeting to go over the observations, the issuance of a 483 listing the inspectional observations, an untitled letter, a warning letter, an injunction, or a seizure. Obviously the list is from least to most serious.

From the FY10 comprehensive inspections of 35 farms 11 farms received NAI (no action indicated), 12 farms received VAI (voluntary action indicated), and 12 farms are still pending. Only 4% of the environmental samples were positive for SE. The FY11 assignments are ongoing, however, to date there have been 213 targeted and 46 comprehensive inspections. Of the 147 samples (houses) sampled, 20 have been positive for SE. In addition there have been 25 state inspections conducted.

**FDA Salmonella Surveillance in Animal Feed**

Daniel McChesney, PhD, Director of the Office of Surveillance and Compliance, Center for Veterinary Medicine, FDA.

Dr. McChesney spoke on the surveillance programs for *Salmonella* in feed. The prevalence of *Salmonella* in feed for the last few years is shown in the table below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Samples tested</th>
<th>No. positive</th>
<th>% Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>187</td>
<td>34</td>
<td>18.2</td>
</tr>
<tr>
<td>2003</td>
<td>194</td>
<td>51</td>
<td>26.3</td>
</tr>
<tr>
<td>2004</td>
<td>150</td>
<td>22</td>
<td>14.7</td>
</tr>
<tr>
<td>2005</td>
<td>194</td>
<td>27</td>
<td>14.0</td>
</tr>
<tr>
<td>2006</td>
<td>144</td>
<td>23</td>
<td>16.0</td>
</tr>
<tr>
<td>2007*</td>
<td>284</td>
<td>28</td>
<td>9.9</td>
</tr>
<tr>
<td>2008*</td>
<td>321</td>
<td>25</td>
<td>7.8</td>
</tr>
<tr>
<td>2009*</td>
<td>584</td>
<td>47</td>
<td>8.0</td>
</tr>
</tbody>
</table>

The data for 2007-2009 contains the routine animal feed testing plus the testing results for direct animal feed samples, which reduced the overall prevalence. The prevalence of *Salmonella* in just animal feed was 11.9%, 10.3%, and 10.0% for the years 2007, 2008, and 2009, respectively. The data still shows a decrease in the prevalence of *Salmonella* in feed. A comparison of the prevalence of *Salmonella* in specific animal feeds from 2002-2006 versus 2007-2009 shows that for poultry feed it went from 12.3%
to 9.1%, for cattle feed from 3.3% to 6.1%, swine feed from 13.3% to 0%, for horse feed from 0% to 0%, and for medicated feed from 11.9% to 13.3%.

There has been increasing concern with *Salmonella* in pet food as evidenced by 26 firms issuing recalls from October 2010 to August 2011. Ten of the recalls were initiated by FDA sampling and another eight by state sampling. Therefore only eight of the recalls were initiated by the firms in-house testing. This casts questions concerning the firm’s internal testing programs.

FDA issued a Comliancy Policy Guide (Sec. 690.800) for *Salmonella* in Animal Feed, which gives the agency’s current thinking and provides guidance for FDA staff. The Guide separates feed into direct-human-contact feeds (home environment) and animal feed (commercial environment). Examples of direct-human-contact feed are pet foods, pet treats, supplements for pets and feeds offered at petting zoos for people to use to feed the animals. FDA’s policy for direct-human-contact feed is the presence of any *Salmonella* serotype deems it adulterated. The policy with animal feed is different in that there are specific serotypes that are of concern and would deem the feed adulterated. For example, for poultry feed the serotypes of concern are *pullorum*, *gallinarum*, and *enteritidis*, whereas with swine feed it is *choleraesuis*, sheep feed – *abortusovis*, horse feed – *abortusequi*, and dairy and beef feed – *newport* and *dublin*.

**ARS Participation in the Salmonella in Feed Food and Feed Research Coalition and Current Research Efforts**

Todd Callaway, USDA-ARS Food and Feed Safety Research Unit

Dr. Callaway shared several of the research efforts of ARS. Transporting animals, for example to market, is a stressful event, however, research suggests that there is more to this stress that just the transport. Some studies have shown that the prevalence or shedding of *Salmonella* increases with transport while others have found no increase. A broader view of the transport issue has been adopted, one that considers the stress on the animals. Stress may come from handling, social mixing of animals, and feed withdrawal in addition to transport. Data suggests that there is a cumulative effect of these different stressors resulting in increased *Salmonella*.

Other research areas are the use of bacteriophage that target *Salmonella*, the use of sodium chlorate to reduce *Salmonella* in the gut of animals, the use of essential oils, and competitive exclusion. Additionally, preharvest research efforts are aimed at investigating the “normal” population of the gastrointestinal tract, the role of birds and pests in *Salmonella* colonization, hormonal stress effects on pathogen shedding, and the effect of diet on the immune systems in poultry.

Current and future research is focused on determining the incidence and concentration of *Salmonella* in commercial feeds, what serotypes are found in feeds, and how these serotypes relate to those that cause human illness.
Update on Recent Compliance Guidelines: USDA-FSIS

Daniel Engeljohn, PhD, Assistant Administrator, Office of Policy and Program Development, USDA-FSIS.

Dr. Engeljohn provided an update on the status of the FSIS compliance guidelines relevant to *Salmonella* in animals. The baseline case rate for *Salmonella* in humans back in 1997 was 13.6/100,000. The industry missed the goal for 2010, with the case rate actually increasing to 17.6/100,000. Of the 4 primary bacteria causing foodborne disease, *Salmonella* was the only one that did not decrease. The U.S. Healthy People 2020 goal for human *Salmonella* cases is 11.4/100,000.

The FSIS Strategic Plan for 2011-2016 has three themes, eight goals and five corporate performance measures. The themes are to prevent foodborne illness, understand and influence the farm-to-table continuum, and to empower people and strengthen infrastructure. The goals are:

1. Ensure that food safety inspections align with existing and emerging risks
2. Maximize domestic and international compliance with food safety practices
3. Enhance public education and outreach to improve food—handling practices
4. Strengthen collaboration among internal and external stakeholders to prevent foodborne illness
5. Effectively use science to understand foodborne illnesses and emerging trends
6. Implement effective policies to respond to existing and emerging risks
7. Empower employees with the training, resources, and tools to enable success in protecting public health
8. Based on defined agency business needs, develop, maintain, and use innovative methodologies, processes, and tools, including PHIS, to protect public health efficiently and effectively and to support defined public health needs and goals

And the corporate performance measures are the total number of all illnesses from FSIS regulated products, percent of broiler plants passing the new *Salmonella* standard, the percent of all establishments with a functional food defense plan, the percent of slaughter plants identified through reviews with effective systematic approach to humane handling, and the average percent of consumers following four key safety “best practices” – cook, clean, chill, separate.

Compliance guidelines are designed to provide non-regulatory safe harbors for industry to use as validated methodology for the control of selected food safety hazards, or for other controls that meet FSIS expectations. The following are relatively recent compliance guidelines that are of particular concern to the *Salmonella* Committee:
“Video or Other Electronic Monitoring of Recording Equipment in Federally Inspected Establishments,” April 2011
“Validation of HACCP Food Safety Systems,” soon to be re-issued; overview posted at NACMPI website
“Time/Temperature Tables for Safe Cooking of Ready-To-Eat Poultry,” June 2009
“Chemical Antimicrobials,” June 2009

NVSL Salmonella Update
Beth Harris, PhD, Chief of Staff, National Veterinary Services Laboratory

Dr. Harris gave the NVSL Salmonella Update in place of Brenda Morningstar-Shaw who was unable to attend.

Recently NVSL has added the multiple-locus variable-number tandem repeat analysis (MLVA) technique to further discriminate between isolates of Salmonella, especially Salmonella enteritidis (SE). The Sensititer antimicrobial susceptibility system was acquired to increase the capability of the lab. Customized panels of Salmonella serotypes are available for other laboratories to use for proficiency testing or serotyping controls. Also there is a plan to offer Salmonella serotyping proficiency test.

A SE Rule Out test was initiated July 2010 to assist in the FDA Egg Rule to rapidly indentify or confirm group D isolates as SE or not SE. Referring labs can submit isolates using form 10-3 and can expect results in 1-2 business days.

The Salmonella Group D proficiency test is a valuable tool to assess the abilities of the authorized laboratories in the National Poultry Improvement Plan (NPIP). Over the last three years the number of labs that have participated in this test have gone from 40 to 70 labs. The mean scores have increased from 93% to 97% and none of the 70 labs failed the latest test.

The number of isolates submitted for serotyping was lower (14,164 isolates) in 2010 than the last five years. The number of clinical isolates serotyped were 4,700, which was almost half of the number of non-clinical isolates (8,473). There were 1,574 group D isolates from chicken submitted for serotyping. Nine-five percent were SE, the remaining 5% were berta, dublin, fresno, javiana, ouakam, and 9,12:non-motile. Salmonella pullorum was not isolated in 2010, but there have been 2 cases in 2011.

NVSL has evaluated molecular typing methods because they are faster and less cumbersome than conventional serotyping, they have high throughput, less quality control (QC) issues and have subjective interpretation. Molecular provides genotype analysis instead of phenotype and it is not affected by expression of antigens. The negative aspect of current molecular methods is they do not identify all serotypes. Evaluation of 48 SE isolates and 119 non-SE isolates using the sdf gene determination of the Luminex assay showed 100% correlation with serotype analysis.
The NVSL serotype data for each animal species is provided in the Appendix.

NPIP Report for the USAHA Committee on Salmonella FY 2011

Steve Roney, National Poultry Improvement Plan, USDA-APHIS

Dr. Roney submitted the NPIP report for inclusion in the Committee report, as he was unable to attend in person.

The value of the U.S. Poultry Industry is approximately $40 billion dollars in revenue in 2011. The success of this industry is largely due to the ability to control diseases such as Salmonella pullorum and Salmonella typhoid. USDA-APHIS-NPIP’s Pullorum/Typhoid control program has contributed significantly to this success.

There were no isolations of Salmonella pullorum in commercial poultry and 2 isolations in backyard poultry in FY2011. There have been no isolations of Salmonella gallinarum in the U.S. since 1988 in any type poultry. U.S. Pullorum-Typhoid Clean participating hatcheries include: 262 egg and meat-type chicken hatcheries, 37 turkey hatcheries, and 768 waterfowl, exhibition poultry and game bird hatcheries.

NPIP U.S.Pullorum-Typhoid Clean Participating Breeding Flocks and Number of Birds include:

- Egg-type chickens, 331 Flocks with 4,323,042 birds;
- Meat-Type Chickens, 6,471 Flocks with 86,324,569 birds;
- Turkeys, 634 Flocks with 5,395,888 birds; and
- Waterfowl, exhibition poultry and game birds with 2,667 flocks with 978,579 birds.

Salmonella control programs administered by the NPIP are Pullorum/Typhoid Clean for all poultry breeders and the basis of the program, Salmonella enteriditis clean (SE Clean) for egg type breeders and egg and meat type primary breeders, Salmonella Monitored for primary meat type breeders and Sanitation Monitored for meat type breeders and turkey breeders.

There were no isolations of Salmonella enteriditis reported in egg type or egg type primary breeders in FY 2011.

The Full report is located following this report.

Committee Business

During the business session the Chair introduced and read through a resolution titled “Identification of Farm Environmental Parameters Hostile to Salmonella” that had been submitted by email from Dr. Ed Mallinson. After reminding the attendees that everyone may participate in the discussion, but only members could propose amendments and vote, the resolution was seconded and discussion ensued. After a few word changes the resolution was voted on and passed easily.

The Chair again thanked the speakers and the attendees for their presence. He reminded the members to review the mission statement and
submit any suggested changes to him to be considered at the next meeting. Also he encouraged members to provide input as to the format of the meeting and suggested speakers.
Salmonella Serotypes Isolated from Animals in the United States: Jan. 1 – Dec. 31, 2010
Diagnostic Bacteriology Laboratory, National Veterinary Services Laboratories, USDA

The Diagnostic Bacteriology Laboratory within the National Veterinary Services Laboratories (NVSL) routinely serotype Salmonella isolates submitted by private, state, and federal laboratories as well as veterinarians, researchers and other animal health officials. Most submissions were from diagnostic laboratories across the U.S., and although only counted as a single submitter, these labs typically submitted Salmonella isolates from a variety of sources, herds, or flocks. This report summarizes Salmonella serotyping submissions to NVSL from January 1 through December 31, 2010. The Salmonella isolates are identified as clinical (clinical signs of salmonellosis from primary or secondary infection) or non-clinical (herd and flock monitoring programs, environmental sources, food). Serotyping data from isolates submitted for research purposes are not included in the source specific summaries. Based on information provided by the submitter the isolates were divided into animal source categories for analysis. The animal sources include Avian (avian of unknown origin, parrot, pheasant, pigeon, rhea, emu, ostrich, quail, duck, and owl), Cattle, Chicken, Dog/Cat, Horse (horse, donkey), Other Domestic (alpaca, ferret, goat, guinea pig, hamster, hedgehog, llama, mink), Pigs, Reptiles/Amphibians (iguana, lizard, reptile, snake, turtle, amphibian, frog, toad), Turkey, Wild/Zoo (antelope, bat, bear, beaver, bison, deer, elk, fish, fox, marine mammals, mongoose, opossum, rabbit, raccoon, rodent, otter, wolf, squirrel, reindeer, camel, elephant, kangaroo, monkey, primate, tapir, tiger, zebra, rhinoceros, wallaby), and Other (environment, water, feed, insects, unknown).

Salmonella serotyping at the NVSL is an ISO 17025 accredited test. Sera used for typing Salmonella isolates consists of polyvalent sera against the O serogroups and single factor sera against the individual O and H antigens. Approximately 50% of the sera used at the NVSL is produced in house as previously described (Ewing), and the rest is purchased from commercial vendors. All sera are subjected to quality control testing prior to use. Salmonella antigenic formulae are determined essentially as previously described (Ewing) and interpreted via the White-Kauffmann-Le Minor scheme (Grimont). The subspecies designation precedes the antigenic formula for those serotypes other than subspecies I. Those serotypes previously reported as “Arizona” are now listed with “III” (both monophasic and diphasic) followed by the antigenic formula. Those serotypes belonging to subspecies II or IV that had been previously named are now listed with their antigenic formula preceded by II or IV.
In 2010 there were 14,164 submissions for Salmonella serotyping originating from 47 different states and Washington, DC. Of these, 561 were identified as not Salmonella, contaminated, or mixed culture and were not further tested. The remaining 13,603 Salmonella isolates were divided into Salmonella rule out submissions (271), clinical isolates (4,700), non-clinical isolates (8,202) and research isolates (393). The sources of clinical and non-clinical Salmonella isolates are shown in Table 1. There were 335 different serotypes identified in 2010. Table 2 lists the 10 most common serotypes when all animal sources were combined. The most common isolates from chickens, turkeys, cattle, pigs, horses, and dog/cat are listed in Tables 3-8.

The NVSL provided a Salmonella proficiency test in order for laboratories to assess their ability to isolate Salmonella from environmental samples and determine the serogroup of any Salmonella isolated. The samples consisted of drag swabs spiked with Salmonella and/or common contaminants. The 2011 test included Salmonella serotypes Enteritidis, Kentucky, Berta, Heidelberg, 9,12: non-motile, Escherichia coli, E. coli (H2S+), Citrobacter freundii, Pseudomonas aeruginosa, and Proteus mirabilis. The test consisted of 7 samples which were shipped to laboratories overnight on ice packs. Laboratories were instructed to use whatever protocol they choose and to report the results within 3 weeks. The NVSL randomly retained 10% of the test kits and tested them blindly for quality assurance (QA) purposes. The results of the proficiency test are shown in Table 9.

Table 1: Sources of submissions to the NVSL for Salmonella serotyping in 2010

<table>
<thead>
<tr>
<th>Source</th>
<th>No. Clinical Submissions</th>
<th>No. Non-Clinical Submissions</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avian</td>
<td>145</td>
<td>35</td>
<td>180</td>
</tr>
<tr>
<td>Cattle</td>
<td>1,396</td>
<td>790</td>
<td>2,186</td>
</tr>
<tr>
<td>Chicken</td>
<td>244</td>
<td>4,740</td>
<td>4,984</td>
</tr>
<tr>
<td>Dog/Cat</td>
<td>77</td>
<td>18</td>
<td>95</td>
</tr>
<tr>
<td>Horse</td>
<td>602</td>
<td>48</td>
<td>650</td>
</tr>
<tr>
<td>Other</td>
<td>134</td>
<td>1,235</td>
<td>1,369</td>
</tr>
<tr>
<td>Other Domestic</td>
<td>62</td>
<td>0</td>
<td>62</td>
</tr>
<tr>
<td>Pig</td>
<td>1,556</td>
<td>285</td>
<td>1,841</td>
</tr>
<tr>
<td>Reptile/Amphibian</td>
<td>121</td>
<td>9</td>
<td>130</td>
</tr>
<tr>
<td>Turkey</td>
<td>245</td>
<td>981</td>
<td>1,226</td>
</tr>
<tr>
<td>Wild/Zoo</td>
<td>118</td>
<td>61</td>
<td>179</td>
</tr>
<tr>
<td>Total</td>
<td>4,700</td>
<td>8,202</td>
<td>12,902</td>
</tr>
</tbody>
</table>
### Table 2: Most common serotypes in 2010: All sources

<table>
<thead>
<tr>
<th>Clinical Serotype</th>
<th>No. Isolates</th>
<th>Non-Clinical Serotype</th>
<th>No. Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typhimurium var 5-</td>
<td>542</td>
<td>Enteritidis</td>
<td>1,449</td>
</tr>
<tr>
<td>Typhimurium</td>
<td>411</td>
<td>Kentucky</td>
<td>1,116</td>
</tr>
<tr>
<td>Dublin</td>
<td>279</td>
<td>Senftenberg</td>
<td>680</td>
</tr>
<tr>
<td>Cerro</td>
<td>228</td>
<td>Typhimurium</td>
<td>334</td>
</tr>
<tr>
<td>Newport</td>
<td>211</td>
<td>Heidelberg</td>
<td>323</td>
</tr>
<tr>
<td>Agona</td>
<td>207</td>
<td>Montevideo</td>
<td>323</td>
</tr>
<tr>
<td>Derby</td>
<td>179</td>
<td>Cerro</td>
<td>216</td>
</tr>
<tr>
<td>Heidelberg</td>
<td>158</td>
<td>Mbandaka</td>
<td>209</td>
</tr>
<tr>
<td>Montevideo</td>
<td>155</td>
<td>Infantis</td>
<td>179</td>
</tr>
<tr>
<td>4,5,12:i:-</td>
<td>139</td>
<td>Newport</td>
<td>173</td>
</tr>
<tr>
<td>All others</td>
<td>2,191</td>
<td>All others</td>
<td>3,200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,700</strong></td>
<td><strong>Total</strong></td>
<td><strong>8,202</strong></td>
</tr>
</tbody>
</table>

### Table 3: Most common serotypes in 2010: Chickens

<table>
<thead>
<tr>
<th>Clinical Serotype</th>
<th>No. Isolates</th>
<th>Non-Clinical Serotype</th>
<th>No. Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteriditis</td>
<td>105</td>
<td>Enteritidis</td>
<td>1,395</td>
</tr>
<tr>
<td>Typhimurium</td>
<td>35</td>
<td>Kentucky</td>
<td>866</td>
</tr>
<tr>
<td>Kentucky</td>
<td>20</td>
<td>Senftenberg</td>
<td>374</td>
</tr>
<tr>
<td>Heidelberg</td>
<td>13</td>
<td>Heidelberg</td>
<td>261</td>
</tr>
<tr>
<td>Senftenberg</td>
<td>7</td>
<td>Typhimurium</td>
<td>150</td>
</tr>
<tr>
<td>All others</td>
<td>64</td>
<td>Mbandaka</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tennessee</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infantis</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typhimurium var 5-</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Montevideo</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All others</td>
<td>1,242</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>154</strong></td>
<td><strong>Total</strong></td>
<td><strong>4,743</strong></td>
</tr>
</tbody>
</table>
### Table 4: Most common serotypes in 2010: Turkeys

<table>
<thead>
<tr>
<th>Clinical Serotype</th>
<th>No. Isolates</th>
<th>Non-Clinical Serotype</th>
<th>No. Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senftenberg</td>
<td>45</td>
<td>Senftenberg</td>
<td>223</td>
</tr>
<tr>
<td>Heidelberg</td>
<td>23</td>
<td>Hadar</td>
<td>100</td>
</tr>
<tr>
<td>Typhimurium</td>
<td>17</td>
<td>Ouakam</td>
<td>60</td>
</tr>
<tr>
<td>Albany</td>
<td>17</td>
<td>Orion</td>
<td>55</td>
</tr>
<tr>
<td>Ouakam</td>
<td>17</td>
<td>Muenster</td>
<td>51</td>
</tr>
<tr>
<td>All others</td>
<td>126</td>
<td>Montevideo</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kentucky</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worthington</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agona</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saintpaul</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All others</td>
<td>285</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>245</strong></td>
<td><strong>Total</strong></td>
<td><strong>981</strong></td>
</tr>
</tbody>
</table>

### Table 5: Most common serotypes in 2010: Cattle

<table>
<thead>
<tr>
<th>Clinical Serotype</th>
<th>No. Isolates</th>
<th>Non-Clinical Serotype</th>
<th>No. Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dublin</td>
<td>265</td>
<td>Kentucky</td>
<td>141</td>
</tr>
<tr>
<td>Cerro</td>
<td>207</td>
<td>Cerro</td>
<td>133</td>
</tr>
<tr>
<td>Montevideo</td>
<td>105</td>
<td>Dublin</td>
<td>74</td>
</tr>
<tr>
<td>Typhimurium</td>
<td>98</td>
<td>Anatum</td>
<td>38</td>
</tr>
<tr>
<td>Newport</td>
<td>90</td>
<td>Typhimurium</td>
<td>31</td>
</tr>
<tr>
<td>I 4,5,12:i:-</td>
<td>86</td>
<td>Newport</td>
<td>26</td>
</tr>
<tr>
<td>Kentucky</td>
<td>64</td>
<td>Typhimurium var 5-</td>
<td>24</td>
</tr>
<tr>
<td>Typhimurium var 5-</td>
<td>59</td>
<td>Agona</td>
<td>19</td>
</tr>
<tr>
<td>Anatum</td>
<td>46</td>
<td>Meleagridis</td>
<td>18</td>
</tr>
<tr>
<td>Agona</td>
<td>40</td>
<td>Bredeney</td>
<td>13</td>
</tr>
<tr>
<td>All others</td>
<td>336</td>
<td>All others</td>
<td>273</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,396</strong></td>
<td><strong>Total</strong></td>
<td><strong>790</strong></td>
</tr>
</tbody>
</table>
### Table 6: Most common serotypes in 2010: Pigs

<table>
<thead>
<tr>
<th>Serotype</th>
<th>No. Isolates</th>
<th>Serotype</th>
<th>No. Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typhimurium var 5-</td>
<td>374</td>
<td>Derby</td>
<td>55</td>
</tr>
<tr>
<td>Derby</td>
<td>164</td>
<td>Typhimurium var 5-</td>
<td>27</td>
</tr>
<tr>
<td>Agona</td>
<td>136</td>
<td>Infantis</td>
<td>21</td>
</tr>
<tr>
<td>Typhimurium</td>
<td>123</td>
<td>Anatum</td>
<td>15</td>
</tr>
<tr>
<td>Heidelberg</td>
<td>96</td>
<td>Typhimurium</td>
<td>14</td>
</tr>
<tr>
<td>Worthington</td>
<td>58</td>
<td>Saintpaul</td>
<td>13</td>
</tr>
<tr>
<td>Infantis</td>
<td>53</td>
<td>Johannesburg</td>
<td>12</td>
</tr>
<tr>
<td>Cholerasuis</td>
<td>52</td>
<td>Heidelberg</td>
<td>10</td>
</tr>
<tr>
<td>Anatum</td>
<td>49</td>
<td>London</td>
<td>10</td>
</tr>
<tr>
<td>Senftenberg</td>
<td>49</td>
<td>Adelaide</td>
<td>9</td>
</tr>
<tr>
<td>All others</td>
<td>401</td>
<td>Agona</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All others</td>
<td>90</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,555</strong></td>
<td><strong>Total</strong></td>
<td><strong>285</strong></td>
</tr>
</tbody>
</table>

### Table 7: Most common serotypes in 2010: Horses

<table>
<thead>
<tr>
<th>Serotype</th>
<th>No. Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Javiana</td>
<td>125</td>
</tr>
<tr>
<td>Typhimurium</td>
<td>114</td>
</tr>
<tr>
<td>Newport</td>
<td>81</td>
</tr>
<tr>
<td>Braenderup</td>
<td>37</td>
</tr>
<tr>
<td>I 4,5,12:i:-</td>
<td>20</td>
</tr>
<tr>
<td>Anatum</td>
<td>19</td>
</tr>
<tr>
<td>Infantis</td>
<td>18</td>
</tr>
<tr>
<td>Muenchen</td>
<td>18</td>
</tr>
<tr>
<td>Orainienburg</td>
<td>18</td>
</tr>
<tr>
<td>Typhimurium var 5-</td>
<td>18</td>
</tr>
<tr>
<td>All others</td>
<td>182</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>650</strong></td>
</tr>
</tbody>
</table>
Table 8: Most common serotypes in 2010: Dogs and Cats

<table>
<thead>
<tr>
<th>Serovar</th>
<th>No. Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mbandaka</td>
<td>10</td>
</tr>
<tr>
<td>Typhimurium</td>
<td>8</td>
</tr>
<tr>
<td>Newport</td>
<td>7</td>
</tr>
<tr>
<td>Agona</td>
<td>5</td>
</tr>
<tr>
<td>Typhimurium var</td>
<td>5</td>
</tr>
<tr>
<td>All others</td>
<td>60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>95</strong></td>
</tr>
</tbody>
</table>

Table 9: Summary of NVSL Salmonella proficiency test

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>40</td>
<td>55</td>
<td>70</td>
</tr>
<tr>
<td>Mean Score</td>
<td>93%</td>
<td>92%</td>
<td>97%</td>
</tr>
<tr>
<td>Score Range</td>
<td>100-44%</td>
<td>100-44%</td>
<td>100-85%</td>
</tr>
<tr>
<td>Below Passing</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>


Pullorum-Typhoid Status:
There were no isolations/outbreaks of *Salmonella pullorum* in 2009 nor in FY 2010. There were no isolations of *S. pullorum* in commercial poultry in FY 2011. There were 2 isolations of *Salmonella pullorum* in backyard birds in FY 2011. There have been no isolations of *Salmonella gallinarum* since 1987 in any type poultry.

| Hatchery Participation in the National Poultry Improvement Plan Testing Year FY2010 |
|---------------------------------|------------------|
| Egg- and Meat-Type Chickens     | 262              |
| Turkeys                         | 37               |
| Waterfowl, Exhibition Poultry and Game Birds | 768              |

<table>
<thead>
<tr>
<th>Egg-Type Chicken Breeding Flocks in the National Poultry Improvement Plan Participation and Testing Summary Testing Year FY2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Pullorum-Typhoid Clean: Participating- Number</td>
</tr>
<tr>
<td>331</td>
</tr>
<tr>
<td>Birds in Flocks-Number</td>
</tr>
<tr>
<td>4,323,042</td>
</tr>
<tr>
<td>Birds tested</td>
</tr>
<tr>
<td>31,866</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Meat-Type Chicken Breeding Flocks in the National Poultry Improvement Plan Participation and Testing Summary Testing Year FY2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Pullorum-Typhoid Clean: Participating- Number</td>
</tr>
<tr>
<td>6,471</td>
</tr>
<tr>
<td>Birds in Flocks-Number</td>
</tr>
<tr>
<td>86,334,569</td>
</tr>
<tr>
<td>Birds tested</td>
</tr>
<tr>
<td>235,550</td>
</tr>
</tbody>
</table>
### Turkey Breeding Flocks in the National Poultry Improvement Plan Participation and Testing Summary
**Testing Year FY2011**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. Pullorum-Typhoid Clean:</td>
<td>634</td>
</tr>
<tr>
<td>Participating – Number</td>
<td></td>
</tr>
<tr>
<td>Birds in Flocks-Number</td>
<td>5,395,467</td>
</tr>
<tr>
<td>Birds tested</td>
<td>18,422</td>
</tr>
</tbody>
</table>

### Waterfowl, Exhibition Poultry, and Game Birds Breeding Flocks In the National Poultry Improvement Plan Participation and Testing Summary
**Testing Year FY2011**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>U. S. Pullorum-Typhoid Clean Participating</td>
<td>2,667</td>
</tr>
<tr>
<td>Birds in Flocks</td>
<td>978,579</td>
</tr>
<tr>
<td>Birds tested</td>
<td>80,522</td>
</tr>
</tbody>
</table>

### Mycoplasma gallisepticum, Mycoplasma synoviae, and Mycoplasma meleagris positive breeding flocks
National Poultry Improvement Plan FY2011

<table>
<thead>
<tr>
<th></th>
<th>WEGBY</th>
<th>Egg-Type</th>
<th>Meat-Type</th>
<th>Turkeys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mycoplasma gallisepticum</td>
<td>16</td>
<td>5</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>M. synoviae</td>
<td>13</td>
<td>3</td>
<td>28</td>
<td>16</td>
</tr>
<tr>
<td>M. meleagris</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
No. of flocks and birds in flocks by State with *Salmonella enteritidis* isolates, 1990-2011

<table>
<thead>
<tr>
<th>State</th>
<th>Environmental</th>
<th>Dead Germ</th>
<th>Bird</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arkansas</td>
<td>1</td>
<td>2</td>
<td>15,000</td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illinois</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indiana</td>
<td>15</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kentucky</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ohio</td>
<td>17</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oregon</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>16</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texas</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oregon</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>16</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texas</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flocks</td>
<td>Birds in Flocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phage type</td>
<td>Environmental</td>
<td>Dead Germ</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>---------------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>Phage type 13</td>
<td>11</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Birds in Flocks</td>
<td>152,000</td>
<td>3,700</td>
<td></td>
</tr>
<tr>
<td>Phage type 13A</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Birds in Flocks</td>
<td>54,321</td>
<td>27,479</td>
<td></td>
</tr>
<tr>
<td>Phage type 2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birds in Flocks</td>
<td>28,900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phage type 23</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birds in Flocks</td>
<td>16,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phage type 28</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Birds in Flocks</td>
<td>15,000</td>
<td>46,000</td>
<td></td>
</tr>
<tr>
<td>Phage type 34</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birds in Flocks</td>
<td>12,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phage type RNDC</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birds in Flocks</td>
<td>7,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phage type Untypable</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birds in Flocks</td>
<td>24,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phage type 8</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birds in Flocks</td>
<td>237,701</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Egg-type Chicken breeding flocks with isolates of *Salmonella enteritidis* by phage type and by year 1989-2011

<table>
<thead>
<tr>
<th>Year</th>
<th>No. Flocks</th>
<th>Phage Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989</td>
<td>1</td>
<td>13A</td>
</tr>
<tr>
<td>1990</td>
<td>11</td>
<td>13A, 13, 8, 28</td>
</tr>
<tr>
<td>1991</td>
<td>12</td>
<td>13A, 13, 8</td>
</tr>
<tr>
<td>1992</td>
<td>10</td>
<td>Untypable, 13A, 8, 28, 34</td>
</tr>
<tr>
<td>1993</td>
<td>5</td>
<td>Untypable, 8, 2</td>
</tr>
<tr>
<td>1994</td>
<td>3</td>
<td>13A, 8</td>
</tr>
<tr>
<td>1995</td>
<td>2</td>
<td>13A, 28</td>
</tr>
<tr>
<td>1996</td>
<td>5</td>
<td>Untypable, RNDC, 13A, 8, 2</td>
</tr>
<tr>
<td>1997</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>1998</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>1999</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>2000</td>
<td>4</td>
<td>13, 8</td>
</tr>
<tr>
<td>2001</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>2002</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>2006</td>
<td>1</td>
<td>34</td>
</tr>
<tr>
<td>2007</td>
<td>4</td>
<td>13, 8</td>
</tr>
<tr>
<td>2008</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>2009</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>3</td>
<td>8(2), 13</td>
</tr>
<tr>
<td>2011</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

### U.S. *Salmonella enteritidis* Clean - Egg-Type Chickens

No. of flocks and birds in the flocks with *Salmonella enteritidis* isolates, 1990-2011

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Dead Germ</th>
<th>Bird</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flocks</td>
<td>71</td>
<td>6</td>
</tr>
</tbody>
</table>
The Committee met on Oct. 4, 2011, at the Adams Mark Hotel in Buffalo, New York from 8:40-10:00 a.m. Twelve members and eight guests were present.

National Scrapie Eradication Program
Diane Sutton, United States Department of Agriculture, Animal and Plant Health Inspection Service, Veterinary Services (USDA-APHIS-VS) gave the following update of the scrapie eradication program:

Scrapie Eradication Program Results
- There has been a 96% decrease in the percent positive sheep sampled at slaughter adjusted for face color, from 0.16 to 0.0067%, since the start of Regulatory Scrapie Slaughter Surveillance (RSSS) in FY 2003 thru Aug. 31, 2011.
- A decrease of 40% newly infected and source flocks was reported in FY 2011 through August compared to the same date in FY 2010.
- At the current rate of progress, we expect the prevalence to be at or near zero for FY 2017.

Slaughter Surveillance
- The number of animals sampled through slaughter surveillance in FY 2011, through Aug. 31, 2011, was 34,146 a decrease from 42,104 in FY 2010 — a decrease of 19%. The decline was primarily due to strict adherence to targeting criteria to reduce testing costs.

Scrapie Surveillance Plan
- Implementation FY 2011
  o States with RSSS collection sites continue to sample all targeted sheep and goats.
  o States have state-of-origin sampling minimums for sheep for FY 2011 and FY 2012.
  o The annual state-of-origin sampling minimum for sheep is 20% of the number required to detect a scrapie prevalence.
of 0.1% with 95% confidence or 1% of the breeding flock in the State, whichever is less. The objective is to sample sufficient sheep in a five-year period to detect a scrapie prevalence of 0.1% with 95% confidence or 5% of the breeding flock in the State, whichever is less.

- If this minimum number was not collected in FY 2010 through RSSS, the State will be expected to find other sampling sources to meet the minimum. Thirty-two States met the FY 2011 sampling minimum in FY 2010.
- Ongoing sampling of nonclinical goats 2, 3, 4 and 5 years old began in FY 2011.

- VS plans to set annual State-of-origin sampling minimum for goats once the proposed rule revising title 9, Code of Federal Regulations (9 CFR) parts 54 and 79 is finalized.
- After States have met their sheep and goat sampling minimums for 5 years, or have accumulated the required number over a longer time period and have not detected a case of classical scrapie, they may be designated as a lower-risk State with lower annual sampling minimums.

Note: These are minimums. Plans are to continue to collect samples from the maximum number of targeted animals given the available budget.

**FY 2012 Funding**

- The President’s budget for FY 2012 includes $15.9 million for the Scrapie Program as part of the Equine, Cervid and Small Ruminant Line. This is a $2 million decrease from the FY 2011 budget of $17.9 million. VS is looking at options for addressing this short fall including making changes to the Scrapie Flock Certification Program.
- As in FY 2011, APHIS plans to support supplement surveillance and identification compliance activities through the use of surplus indemnity funds in FY 2012. These activities include: collection and testing of samples for scrapie; identification compliance monitoring and enforcement at concentration points; and provision of official eartags to producers. This use reflects the greatest benefit to the program.

**FY 2012 Priorities**

- VS priorities for scrapie are to focus on improving the effectiveness and cost efficiency of surveillance and to increase animal identification compliance. This will be accomplished in part by publishing a proposed rule that would address gaps in identification and require States to meet reasonable surveillance targets to remain consistent States. States must meet these targets for VS to demonstrate geographically appropriate surveillance to meet the criteria for freedom and have confidence that all of the cases have been found.
• The rule would propose to:
  o Give the APHIS Administrator authority to relieve requirements for sheep and goats exposed to scrapie types, such as Nor98-like, that do not pose a significant risk of transmission.
  o Increase flexibility in how investigations can be conducted and allow the epidemiology in a specific flock to be given more consideration in determining flock and animal status.
  o Add a genetic-based approach to regulation.
  o Make goat identification requirements similar to those for sheep to support ongoing slaughter surveillance in goats; no changes will be made in the consistent State requirements regarding identification of goats in intrastate commerce.
  o Tighten the definition of slaughter channels.
  o Expand the individual identification requirement to all sexually intact animals unless moving as a group/lot (allows mixed-source groups moving in slaughter channels under 18 months).
  o Limit the use of tattoos and implants to animals not moving through markets and not in slaughter channels.
  o Reduce recordkeeping requirements by making them similar to the current uniform methods and rules compliance guidance.

• APHIS is also revising its scrapie import regulations to bring them more in line with the OIE scrapie chapter. This will ensure that we meet OIE criteria for free status and prevent the reintroduction of scrapie after free status is achieved.

Scrapie Flock Certification Program (SFCP) Standards

• APHIS is considering options for revising the SFCP standards to reduce costs associated with the program and to incorporate recent changes. Scrapie program staff has collected input from SFCP enrolled producers, industry representatives, and State and federal stakeholders. Options being considered include:
  1) Eliminating the Complete and Selective Monitored Categories;
  2) Having accredited veterinarians conduct inspections at owner expense;
  3) Decreasing frequency of inspection in the complete monitored category and removing the inspection requirement from the Selective Monitored Category; and
  4) Eliminating the Complete Monitored Category, removing the inspection requirement from the Selective Monitored Category, and making minor changes to the Export Monitored Category.
USDA-ARS Scrapie Research

Dr. Massaro Ueti from USDA, Agriculture Research Service (ARS), Animal Disease Research Unit (ADRU) presented an update for Katherine O’Rourke (USDA-ARS). The USDA-ARS unit in Pullman, Washington, conducts an integrated research program involving studies on scrapie transmission, diagnosis and susceptibility genetics in domestic sheep and goats. A study on Nor98-like scrapie in breeding ewes is now in its fourth year. Ewes were experimentally inoculated via the intracerebral route with brain homogenate from a Nor98-affected sheep and bred annually to examine the placenta for evidence of a transmissible agent. Placentas shed in 2009 and 2010 were negative for the abnormal form of the prion protein; placentas shed in 2011 are being analyzed.

Another investigation underway involves transmission of scrapie in goats. Prions are scarce in the placenta of scrapie-infected goats, so current studies are being performed to analyze milk from infected goats to determine if milk may play a role in transmission. Improvements in the tissue-based (rectal biopsy) live animal test for scrapie are also in progress. In addition, a long-term study examining the effect of genotype on susceptibility to goat scrapie and the effect of genetic changes on accuracy of live animal testing are in their third year. Following oral inoculation at birth with scrapie positive goat placenta, goats with the highly susceptible genotype all developed clinical disease within 24 months. Goats with the less susceptible or long incubation genetics (S146 or K222) are clinically normal with no evidence of prions in rectal biopsy tissues. These goats will be monitored for seven years.

Committee Business

The Committee discussed the proposed changes to the Scrapie Flock Certification Program and the pros and cons of the four change options described by Dr. Diane Sutton. The majority of members supported option 4: Eliminating the Complete Monitored Category, removing the inspection requirement from the Selective Monitored Category, and making minor changes to the Export Monitored Category. Further discussion of possible changes to the select monitored category supported some level of continued inspections in this category.

The final response from the Committee’s 2010 resolution was read and discussed. This resolution requested that USDA, Food Safety Inspection Service (FSIS) and United States Department of Health and Human Services, Food and Drug Administration work with USDA-APHIS-VS, the Scrapie Program staff, and industry to identify and approve appropriate sites for radio-frequency identification implants for goats and sheep. Dr. Sutton has been in contact with USDA-FSIS and two options appear to be possible assuming the implant site selected is the tail: 1) the entire tail would be removed at slaughter, or 2) the industry would have to prove that the implant was
successfully removed when the hide is removed. Dr. Sutton will follow-up with FSIS and industry groups to move this process forward.

Committee members discussed USDA’s proposed changes to the line item funding for FY12. Concern was expressed that inclusion of other species along with sheep and goats would impact the funding, and ultimately the success, of the scrapie eradication program. A resolution was discussed and passed that urged USDA-APHIS-VS to establish a separate species line item for Sheep and Goat Health.

The other concern the Committee discussed was the critical importance of continued scrapie surveillance in both sheep and goats to the success of the eradication program. The Committee discussed and passed a resolution that urged USDA-APHIS-VS to maintain or increase scrapie surveillance levels for sheep and increase surveillance levels for goats.
REPORT OF THE COMMITTEE ON SHEEP AND GOATS

Chair: William Edmiston Jr., TX
Vice Chair: Don Knowles, WA

Derek Belton, NZL; Scott Bender, AZ; Deborah Brennan, GA; John Clifford, DC; Thomas Conner, OH; Walter Cook, WY; Stephen Crawford, NH; Linda Detwiler, NJ; Nancy East, CA; Effingham Embree, Jr., IL; Anthony Gallina, FL; Chester Gipson, MD; Joseph Huff, CO; Paul Jones, AL; Eileen Kuhlmann, MN; James Leafstedt, SD; Howard Lehmkuhl, IA; Mary Lis, CT; Linda Logan, TX; Jim Logan, WY; Francine Lord, CAN; Michael Marshall, UT; David Marshall, NC; Chuck Massengill, MO; Cheryl Miller, IN; Ron Miller, PA; Jeffrey Nelson, IA; Charles Palmer, CA; Kristine Petrini, MN; Suelee Robbe-Austerman, IA; Paul Rodgers, WV; Joan Rowe, CA; Mo Salman, CO; A. David Scarfe, IL; William Shulaw, OH; Diane Sutton, MD; David Thain, NV; Peter Timm, CA; Hector Webster, CA; Stephen White, WA; Margaret Wild, CO; Ellen Wilson, CA; William Wilson, KS; George Winegar, MI; Nora Wineland, MO; David Winters, TX; Cindy Wolf, MN.

The Committee met on Oct. 4, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 1:00 p.m. to 4:00 p.m. There were 12 members and 20 guests present.

NAHMS 2009 Goat and 2011 Sheep Studies
Bruce Wagner, National Animal Health Monitoring System (NAHMS), USDA-APHIS-VS

Dr. Wagner presented results of the 2009 NAHMS study relating to the population distribution and management practices of the Goat Industry, and presented early reporting about the 2011 Sheep Report. A complete copy of the presentation is included at the end of the report.

Dr. Katherine Marshall presented by telephone with Bruce Wagner coordinating her slides. The presentation discussed virus shedding and disease prevalence, testing and recent disease outbreaks.

The Epidemiology of Q Fever in the U.S.
Jennifer McQuiston, Rickettsial Zoonoses Branch Center for Disease Control and Prevention

Dr. McQuiston presented disease prevalence and exposure levels in several Ruminant species, and discussed clinical and zoonotic implications of this Coxiella burnetii. Vigorous discussion was conducted by the Committee and guests. A complete copy of her presentation is included at the end of the report.
Committee Business

The Committee discussed, deliberated and passed three resolutions titled “Q-Fever Vaccine for Sheep and Goats and for Humans in the United States;” “Scrapie Eradication Program – Surveillance Levels;” and “United States National List of Reportable Animal Diseases.”
The Committee met on Oct. 3, 2011, from 1:00 to 4:30 p.m and Oct. 4, 2011, from 1:00 to 5:15 p.m. at the Buffalo Adam’s Mark Hotel in Buffalo, New York. There were 50 Committee members and 35 guests in attendance. Chair Julie Helm presided, assisted by Vice-Chair Marion
Garcia. The Chair welcomed the Committee, summarized the 2010 meeting, and reported on the responses to the 2010 Resolutions:

Resolution 6 - UNITED STATES NATIONAL LIST OF REPORTABLE ANIMAL DISEASES (NLRAD); Response: The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) recognizes the concerns of the United States Animal Health Association (USAHA) and appreciates the opportunity to respond. USDA-APHIS-VS and the National Animal Health Reporting System (NAHRS) subcommittee of the USAHA/American Association of Veterinary Laboratory Diagnosticians Joint Committee on Animal Health Surveillance and Information Systems continue to move forward with implementing a U.S. National List of Reportable Animal Diseases (NLRAD). Currently, NLRAD is under review by National Association of State Animal Health Officials and VS Area Veterinarians in Charge with comments requested by Sept. 23, 2011. The NLRAD has also been distributed to USAHA animal disease commodity committees with a request for discussion in Buffalo at the USAHA meeting and comments by October 30. After considering the current round of stakeholder comments with concurrence of the NAHRS subcommittee and final approval by VS management, it will be published as a cooperative State-Federal set of guidelines for reportable disease. In addition, once the NLRAD is finalized, VS will initiate the regulatory process to establish and maintain the NLRAD and associated reporting requirements.

Resolution 44: URBAN CHICKENS/POULTRY – NEED FOR TARGETED EDUCATION AND FUNDING FOR PEOPLE IN METROPOLITAN AREAS RAISING POULTRY; Response: The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) recognizes the concerns of the United States Animal Health Association regarding the need for targeted education for people who raise poultry in metropolitan areas. APHIS continues to maintain the Biosecurity for the Birds campaign, as it is regarded as a highly successful outreach campaign both by States and industry. Additionally, the Live Bird Market Technical Working Group recommended at its February 2011 meeting that APHIS continue to support the Biosecurity for the Birds campaign. The campaign already includes creative ways to reach its target audience, including urban poultry owners. For example, it works with hatcheries and feed distributors to place messages on their product packaging (chicks and chicken feed). One of the most recognized and widely used publications is the annual biosecurity calendar. The campaign has begun Bird Health Awareness Week (the first week in November) as an additional way to focus attention on biosecurity and disease awareness. In addition, more than 350 people participated in an educational webinar held in November 2010; many of them were urban poultry owners. VS recently completed a study on poultry ownership in four
metropolitan areas: Denver, Colorado; Los Angeles, California; Miami, Florida; and New York City, New York. This study is posted online at www.aphis.usda.gov/animal_health/nahms/poultry/downloads/poultry10/Poultry10_is_Biosecurity.pdf. The study provides valuable information about urban poultry owners that will further help the Biosecurity for the Birds campaign target this audience. Regarding funding, the President’s fiscal year 2012 budget requested $43.6 million for the avian health line item. This request is intended to support our avian influenza domestic poultry programs as well as the Biosecurity for the Birds campaign.

Resolution 42: SECURE EGG SUPPLY PLAN FOR WHOLE SHELL EGGS, EGG PRODUCTS, AND DAY-OLD CHICKS WITHIN, OUT OF, AND INTO HIGHLY PATHOGENIC AVIAN INFLUENZA DISEASE CONTROL AREAS; Response: Favorable State responses were received from: Georgia, Hawaii, Maryland, Massachusetts, New York, South Dakota, Tennessee, Washington and West Virginia. Comments from the floor included: Dr. Helm (Chair, Clemson University Livestock Poultry Health, Columbia, SC) noted that she believed that the lack of State responses may have been due to the States did not realizing they should have responded back to USAHA; and Dr. Zach (National Center Animal Health Emergency Management, USDA-APHIS-VS, Riverdale, MD) noted that a few other states not listed above had signed agreements.

Resolution 45: INVOLVEMENT OF VETERINARIANS IN THE IMPLEMENTATION OF THE FOOD AND DRUG ADMINISTRATION SALMONELLA ENTERITIDIS RULE; Response: No response received from FDA to USAHA. The Committee made a recommendation to request that the USAHA President and Executive Committee submit a letter to the responsible person(s) at FDA involved in implementing the FDA Egg Safety Rule of 2009 in order to respond to Resolution 45 and that this issue is brought forth to the Government Relations Committee.

Dr. Greg Rosales, Aviagen, Inc, Huntsville, Ala., gave the Mycoplasma Subcommittee report in lieu of Dr Eric Jensen, Chair of the Mycoplasma Subcommittee. The report was approved by the Committee and is included in these proceedings.

Dr. Julie Helm, Chair, Clemson University Livestock Poultry Health, Columbia, S.C., gave the Infectious Laryngotracheitis (ILT) Subcommittee report. The report was approved by the Committee and is included in these proceedings.

Dr. Don Ritter, Mountaire Farms Inc., Millsboro, Del., presented the annual industry report for the broiler industry. The report was approved by the Committee and is included in these proceedings.

Dr. Eric N. Gingerich, Diamond V, Zionsville, Ind., delivered the annual industry report for the table egg industry. The report was approved by the
Committee and is included in these proceedings. Dr. Annette Whiteford, California Department of Food & Agriculture, was asked to give an update on the status of very virulent Infectious Bursal Disease (vvlBD) in California. More information on the California vvlBD situation can be found at http://www.cdfa.ca.gov/ahfss/. More information on the California outreach to backyard and 4-H flock owners can be found at http://www.cdfa.ca.gov/ahfss/Animal_Health/.

Dr. Eric Gonder, Butterball Turkeys, Goldsboro, N.C., in lieu of Dr. Steven Clark, Alpharma Animal Health, West Jefferson, N.C., gave the annual industry report for the turkey industry. The report was approved by the Committee and is included in these proceedings.

Dr. John Smith, United States Poultry and Egg Association, U.S. Poultry Research Advisory Committee, Baldwin, GA, presented the U.S. Poultry & Egg Association Research Report. The report was approved by the Committee and is included in these proceedings.

Dr. Shauna Voss, Center for Animal Health and Food Safety, University of Minnesota, St. Paul, Minn., gave a presentation on HPAI: Collaborative Planning to Maximize Market Continuity which is included in these proceedings.

Dr. Fidelis Hegngi, USDA-APHIS-VS, National Center for Animal Health Programs, Riverdale, Md., presented the annual status report for the National Poultry Improvement Plan (NPIP) for the Senior Coordinator, Dr. Steve Roney, USDA-APHIS-VS, Conyers, Ga. The report was approved by the Committee and is included in these proceedings.

Ms. Jan Pederson, USDA-APHIS-VS, National Veterinary Services Laboratory (NVSL), Ames, Iowa, delivered the annual status report for NVSL Avian Influenza and Newcastle Disease Diagnostics and Avian Import Activities. The report was approved by the Committee and is included in these proceedings.

Dr. Beth Harris, USDA-APHIS-VS, NVSL, Ames, Iowa, delivered the annual NVSL Diagnostic Bacteriology report. The report was approved by the Committee and is included in these proceedings.

Dr. Bruce Wagner, USDA-APHIS-VS Centers for Epidemiology and Animal Health (CEAH), Fort Collins, Colo., reported on the National Animal Health Monitoring System (NAHMS) Poultry Study 2010 report for Dr. Lindsey Garber. Dr. Garber’s report is included in these proceedings.

The Monday session adjourned at this point, at approximately 4:30 p.m. The meeting reconvened at 1:00 p.m. on Tuesday, Oct. 4, 2011.

Dr. Jonathan Zack, National Center Animal Health Emergency Management, USDA-APHIS-VS, Riverdale, MD, gave an update on USDA Emergency Management. His update is included in these proceedings.

Dr. David Suarez, USDA-ARS-SEPRL, Athens, Ga., in lieu of Dr. David Swayne, Chair of the Avian Influenza and Newcastle Disease Subcommittee,
gave the Subcommittee report. The report was approved by the Committee and is included in these proceedings.

Drs. David Suarez and Michael Day, USDA-ARS-SEPRL, Athens, Ga., gave the Southeastern Poultry Research Laboratory Research (SEPRL) Update. The report is included in these proceedings.

Dr. Aly Fadly, Avian Diseases & Oncology Laboratory (USDA-ARS), Lansing, Mich., presented an update on current research activities at the laboratory. The report is included in these proceedings.

Dr. Aly Fadly, Avian Diseases & Oncology Laboratory (USDA-ARS), Lansing, MI, in lieu of Dr. Justin Brown, Southeastern Cooperative Wildlife Disease Study College of Veterinary Medicine University of Georgia, presented a report on Lymphoproliferative Disease Virus in Wild Turkeys in the Southeastern United States. The report is included in these proceedings.


Dr Eric Gingrich, Diamond V, Zionsville, Ind., presented an overview of the USAHA Committee on Salmonella meeting. See the Report of the Committee on Salmonella in these proceedings for more information.

Committee Business

The Committee approved a Resolution entitled “APHIS’ ROLE IN PRE-HARVEST FOOD SAFETY” urging the Secretary of Agriculture to designate the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) as the lead agency for federal Pre-Harvest Food Safety (PHFS) efforts for chicken and turkey meat-type birds.
A review of percent condemnations/year due to airsacculitis in broilers (by Dr. F. Hegngi USDA-APHIS-VS) showed a correlation between the implementation of Mycoplasma gallisepticum (MG) and Mycoplasma synoviae (MS) programs and the continuous decline over the years of mycoplasma infection in the industry. The number of cases of MG and, in particular, MS has decreased significantly in broiler breeders since the previous year resulting in a corresponding decline in the number of broiler cases.

The NPIP continues to support the production of a panel of convalescent sera (by Dr. N. Ferguson-Noel, PDRC, University of Georgia) used by NPIP-authorized laboratories, and to organize annual mycoplasma diagnostic workshops to meet the plan’s training requirements. These services are invaluable to maintain standard diagnostic methods, promote the proficiency of NPIP-authorized laboratories, and support domestic and international trade of breeding stock and poultry products.

Fewer MG and MS cases were documented in NPIP-participating breeder flocks belonging to the egg-type chickens, meat-type chickens, exhibition and game bird categories in 2010-11 compared to 2009-10; however, there were a few more of MS cases in turkey breeders.

During 2010 Mycoplasma synoviae (MS) was identified on eight turkey breeder flock premises in a previously clean region. MS positive serology (ELISA) identified these flocks and results were confirmed at the Poultry Diagnostic and Research Center (PDRC), Athens, Ga. These positive breeder flocks were quarantined and State and industry stakeholders developed a containment plan. The plan consisted of increased surveillance to identify positive flocks, treatment and quarantine of positive breeder flocks, hatchery management to minimize spread, grower notification, depopulation of positive flocks and the supervised cleaning and disinfection of affected premises. Within seven months all positive flocks were depopulated with no further MS spread. A small flock of layer chickens was identified as the source of the infection. These cases highlight the importance of a diagnostic laboratory for PCR/culture confirmation diagnostics, the need for a thorough epidemiological investigation, re-evaluation of MS diagnostics in turkeys (SPA vs. ELISA vs. PCR) and the review of the biosecurity program within a turkey breeder operation system.

During 2010-2011 the broiler industry experienced less MG and MS field outbreaks than the previous year. MG or MS live vaccines used is some regions were discontinued after one cycle. Besides vaccination, improved biosecurity practices have contributed to the decline in the number of field
outbreaks. Several states reported infections in backyard chickens accentuating the risk posed by these birds to commercial and NPIP participating flocks. The prompt intervention by State health officials by quarantining and/or persuading owners to voluntarily eliminate infected birds has provided and invaluable service to prevent further spread to other backyard and commercial operations. There is a need for mycoplasma-clean bird producers that could supply backyard bird owners.

Many of the reports and comments by Committee members emphasized the importance of continuous surveillance and access to laboratories with specialized mycoplasma diagnostic capabilities.
REPORT OF THE COMMITTEE

REPORT OF THE SUBCOMMITTEE ON
INFECTIOUS LARYNGOTRACHEITIS (ILT)
Julie Helm, Chair
Clemson University Livestock Poultry Health

The Subcommittee met at the Adam’s Mark Hotel, Buffalo, New York on Oct. 2, 2011, following the Subcommittee on Mycoplasma with 33 attendees.

Introduction: Vaccinal Laryngotracheitis (VLT) is an acute viral respiratory disease primarily of chickens. Economic losses attributable to VLT have been important in many poultry producing areas throughout the United States and the world. Despite efforts to control the disease through vaccination and implementation of biosecurity measures, outbreaks of VLT are still a threat to the poultry industry.

Research Update: Dr. Maricarmen Garcia (PDRC, GA) presented research evaluating protection of commercial broilers using Fowl Pox (FP) and Herpes Virus (HV) vectored vaccine when compared to live vaccines in a challenge model. Broilers were vaccinated by in-ovo and subcutaneous methods of administration compared the vectored vaccines to live vaccines in a challenge model. The birds were challenged at 35 or 57 days post-vaccination and evaluated for clinical signs and viral replication in the trachea. Both vectored vaccines mitigated the disease, but neither reduced the viral load in the trachea to the level of the live attenuated vaccine, which was used to determine a baseline protection. HV vectored vaccine induced better protection compared to FP vectored vaccine in both the in-ovo and subcutaneous administration methods. FP vectored vaccine administered subcutaneously at one day of age in broilers was more effective in reducing clinical signs and eliciting antibody response compared to the in-ovo administration. The protection induced by vectored vaccines in broilers was better attained when the birds were challenged at 57 days post-vaccination versus 35 days post-vaccination. In summary: the recombinant vaccines do mitigate disease and reduce the amount of challenge virus in the trachea in the face of a strong challenge; preliminary data demonstrates that recombinant vaccinated birds can shed virus and can disseminate disease to naïve birds; and in endemic disease areas with recombinant vaccinated birds, biosecurity measures need to be implemented during the movement of birds and poultry by-products (litter). References: Johnson, D. I., A. Vagnozzi, F. Dorea, S. M. Riblet, A. Mundt, G. Zavala, and M. García. Protection against infectious laryngotracheitis virus (ILTV) by in ovo vaccination with commercially available viral vector recombinant vaccines. Avian Dis. 54:1251–1259. 2010; Vagnozzi, A., G. Zavala, S. M. Riblet, A. Mundt, and M. García. Protection induced by Infectious laryngotracheitis virus (ILTV) Live-attenuated and Recombinant Viral Vector Vaccines in Broilers. In Press Avian Pathology.

Regional Updates – VLT incidence, vaccination strategies, and control measures:
Northeast – In one region, 75% of the broiler companies had discontinued the use of CEO last winter. When VLT cases started in September, CEO vaccination was initiated again.

Southeast – States which had higher number of cases in broilers from several years ago reported fewer and more sporadic cases last year. These states are using a combination of no vaccination, CEO and/or vectored vaccines and varied other types of control methods in their broiler industries. A few other southern states reported having cases for the first time in several years; one such state had not seen cases since 2003.

Midwest – In layers, one complex had changed to vaccinating pullets with a recombinant vaccine instead of CEO. The birds exhibited clinical signs after moving into the lay house. They are currently using recombinant and TCO vaccines, and no CEO. No reports in broilers.

West, Southwest – No reports.
High Pathogenicity Avian Influenza (HPAI). H5N1 HPIA are endemic in five countries: 1) self-declared endemic (Egypt and Indonesia), 2) continue to report occurrences of outbreaks over multiple years (Vietnam and Bangladesh), or 3) have published data in the literature of continuous reports of infection and molecular evidence of virus continual presence in country (China).

For 2010, 19 countries reported outbreaks of H5N1 in domestic poultry (P; n=11), wild birds (WB; n=4) or both (n=4): Bangladesh (endemic in P), Bhutan (P), Bulgaria (WB), Cambodia (P), China (WB, endemic in P), Egypt (endemic in P), Hong Kong (WB), India (P), Indonesia (endemic in P), Israel (P, WB), Japan (P, WB), South Korea (P, WB), Laos (P), Mongolia (WB), Myanmar (P), Nepal (P), Romania (P), Russia (WB), and Vietnam (endemic in P). The majority of the outbreaks occurring in Indonesia, Egypt, Vietnam, and Bangladesh, in decreasing order. Domestic poultry had 540 outbreaks involving 87,343 cases and wild birds had 12 outbreaks and 601 cases.

For 2011 (through August 2011), 13 countries reported outbreaks of H5N1 domestic poultry (P; n=7), wild birds (WB; n=2) or both (n=4): Bangladesh (endemic in P), Cambodia (P, WB), Egypt (endemic in P), Hong Kong (WB), India (P), Indonesia (endemic in P), Israel (P, WB), Japan (P, WB), South Korea (P, WB), Mongolia (WB), Myanmar (P), Palestine (P), and Vietnam (endemic in P). There were 559 outbreaks involving 205,130 cases in poultry and 50 outbreaks involving 97 wild birds. There was also an ongoing H5N2 HPAI outbreak in South African ostriches with minimal to no clinical disease.

For 2010, H5N1 HPAI viruses from Egypt and Israel were in clade 2.2.1. One group contained all the human isolates, which clustered with 2009 backyard poultry sequences, while the H5N1 viruses from commercial poultry clustered out separately. Epidemiologically the outbreaks are scattered all throughout the Nile delta, corresponding with human and poultry density maps. For Bhutan, West Bengal (India), Nepal and Bangladesh, the H5N1 viruses were in clade 2.2. Vietnam, China, Romania, Bulgaria (buzzard), Mongolia, and Nepal had H5N1 viruses in clade 2.3.2. Epidemiologically, this clade 2.3.2 was spread from Mongolia, over China, to Vietnam, Myanmar and Nepal. Viruses of 2.3.2 were also detected in Hong Kong (sparrow), Japan, Myanmar, Russia (grebe), and S. Korea. Vietnam, Lao, and Myanmar had H5N1 clade 2.3.4 viruses. The Vietnam viruses subclustered into two groups: 1) subgroup A present in northern Vietnam and South Myanmar, and 2) subgroup B which was present in North, Central, and South Vietnam, and in Lao. In Indonesia, based on 2007-2008 data, the clade 2.1 virus lineage has continued to genetically diversify from the initial introduction in 2003 with ~80% of the isolates in subclade 2.1.3. Some subclade 2.1.1 viruses exit along with an undefined subclade lineage but 2.1.2 is no longer detected.
The majority of isolates are from village poultry with minimal evidence of antigenic drift. In 2006, an outlying antigenic variant group was identified in West Java isolates that was resistant to existing AI vaccine seed strains, but these vaccine variant viruses are no longer present in commercial poultry. Clade 1 was found in southern Vietnam.

For 2011 H5N1 viruses, the maintenance of distinct clades and subclades continues: 1) subclade 2.3.2 viruses were found in northern and central Vietnam, eastern India, Japan, S. Korea, Bulgaria and Myanmar; 2) subclade 2.2.1 viruses in Egypt and Israel; 3) subclade 2.2 lineage in Bulgaria; 4) subclade 2.3.4 lineage viruses in Bangladesh, Myanmar and Bulgaria; and 5) clade 1 lineage viruses in southern Vietnam.

**Newcastle Disease.** In 2010, 81 countries had Newcastle disease in poultry or wild birds, either as suspect cases, infections without clinical disease, infections with clinical disease or limited infections of poultry. In 2011 (January to July), 23 countries had Newcastle disease in poultry or wild birds.
Mortality versus Bird Size: Mortality for all bird sizes (small = 3.6-4.4 lbs, middle = 5.2 – 6.0 lbs, large = >7.5 lbs) remains low and in line with historical trends.

Ranking of Disease Concerns: The disease concerns of nine broiler industry veterinarians from the Association of Veterinarians in Broiler Production (AVBP) are ranked below.

Bacterial disease issues clustered at the top of the disease list. The top three disease concerns involved intestinal health of bacterial origin caused by Clostridia. E. coli-associated inflammatory process was next, followed with S. aureus arthritis in broiler breeder males. Spinal abscesses caused by E. cecorum also made the top disease list, along with M. synoviae. Viral conditions of Infectious Laryngotracheitis, Runting Stunting Syndrome and Infectious Bronchitis completed the list.

Ranking of Non-Disease Concerns: Non-disease issues of concern to the broiler industry were ranked by nine broiler industry veterinarians as above.

The unprecedented and sustained rise in feed grain prices, especially corn, was a top concern of many respondents. The current U. S. energy policy virtually mandates that 40% of U.S.-produced corn be used to produce ethanol instead of being used for animal feeds. The Salmonella Initiative Program (SIP) being implemented by USDA-FSIS in November 2011 is also a global concern. This voluntary program reduces the allowable incidence of Salmonella in FSIS carcass rinse tests and also establishes the first standards for Campylobacter testing of carcasses. After grain prices and SIP, miscellaneous issues populated the remainder of the survey, including coccidiostat availability, animal welfare, breeder feathering and production, ground chicken USDA-FSIS standards and export documentation.

Ranking of Research Needs: Research needs of the broiler industry were ranked by nine broiler industry veterinarians as above.

Food safety interventions for Salmonella/Campylobacter and gut health including intestinal microflora management were listed as top research needs in the broiler industry. Vaccine research involving vector vaccines (efficacy?) and Infectious Bronchitis (pan-serotype vaccine) was listed next. Miscellaneous research topics of alternative feed ingredients, practical animal welfare, Staphylococcal arthritis in male breeders and development of new protozoal control products rounded out the list.

Economic Crisis in the Broiler Industry: Current high feed prices primarily due to U.S. energy policies related to domestic ethanol production coupled with the overall downturn in poultry meat prices due to oversupply have created a “perfect storm” of sustained economic losses in the broiler industry. Losses have been large enough to force two of the top twenty broiler companies to declare bankruptcy in the past twelve months. Due to poor domestic industry conditions both companies found foreign buyers
(Ukraine and South Korea) for all or part of their assets. Unfortunately half of one company was completely shut down only six months after being sold to a Ukrainian investor. Tough economic times continue to make survival in the broiler industry extremely challenging in 2011.
Overall health of the national table egg layer flock continues to be very good. There are no major clinical disease problems occurring. This is due to the several resources and practices available to the industry:

- Continued availability of high quality vaccines;
- Flock supervision from professional, well-trained flock supervisors;
- Readily available veterinary technical assistance from primary breeder, vaccine company, diagnostic laboratory, feed additive suppliers, and consulting veterinarians;
- High-quality nutrition provided by professional nutritionists;
- Housing of a majority of layers in environmentally controlled facilities in cages without exposure to litter; and
- Use of sound biosecurity practices.

A poll of the Association of Veterinarians in Egg Production (AVEP) was conducted within the last month. The members were asked to rate a list of common diseases of pullets (21 conditions listed) and layers (30 conditions listed) as to their prevalence in their area of service on a scale of 1 to 4 with 1 = not seen, 2 = seen but not common, 3 = commonly seen, and 4 = widely seen. The survey revealed the following diseases of concern occurring in U.S.:

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Caged Pullets</th>
<th>Caged Layers</th>
<th>Cage-free Pullets</th>
<th>Cage-free Layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chick starveouts – 2.28</td>
<td>Calcium depletion – 2.54</td>
<td>Coccidiosis – 2.55</td>
<td>Cannibalism – 3.00</td>
</tr>
<tr>
<td>2</td>
<td>Chick yolk infections – 2.08</td>
<td>Colibacillosis – 2.50</td>
<td>Chick starveouts – 2.25</td>
<td>Colibacillosis – 2.63</td>
</tr>
<tr>
<td>3</td>
<td>Marek’s – 2.00 Coccidiosis – 2.00</td>
<td>Mycoplasma synoviae(Ms) – 2.42</td>
<td>Yolk infections – 2.20</td>
<td>Ascarids – 2.42</td>
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<tr>
<td></td>
<td></td>
<td>Mites – 2.42 Cannibalism – 2.42</td>
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<td>4</td>
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</tr>
<tr>
<td>5</td>
<td>E. coli – 1.76</td>
<td>E. coli – 1.95</td>
<td>Mites – 2.26</td>
<td></td>
</tr>
<tr>
<td># of Responses</td>
<td>25</td>
<td>24</td>
<td>20</td>
<td>19</td>
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</table>
Chick mortality problems are normally associated with small chicks, poor sanitation in the hatchery, or a lack of proper brooding management on the grow farm. As this problem continues high on the prevalence list, the emphasis on solving this issue is apparently not being addressed successfully.

Calcium depletion is normally associated with low intake of calcium, phosphorus, and/or vitamin D3 especially early in production with low feed intakes. This condition will be an ongoing issue with increasingly higher egg production rates through improvements in management and genetics.

Colibacillosis is a problem mainly of young flocks with mortality rates of 0.5% to 4% per week starting shortly after housing. It is felt that this condition is most often secondary to upper respiratory challenges with MG, Mycoplasma synoviae (MS), ammonia, infectious bronchitis (IB), etc. It also may be a primary problem if water lines are contaminated with E. coli. The overall incidence of early onset colibacillosis continues on the downward trend. A post-molt colibacillosis syndrome is also seen in some flocks due to declining immune system function, an ascending infection of the reproductive tract, upper respiratory infections, etc. The live E. coli vaccine, introduced in mid to late 2006, has been increasingly used successfully as both a preventative and as a treatment in the face of an outbreak.

An external parasite, the Northern Fowl Mite, has risen to prominence in cage layers in past years’ surveys. The difficulty in treating this condition, in cages and in cage-free flocks, has likely led to this increase. Spray treatment of caged layers is difficult due to the configuration of equipment. Elemental sulfur in dust baths is being used successfully in cage-free flocks. Feeding of elemental sulfur will aid in reducing numbers of mites on birds as well. Decontamination of pullet moving trucks and equipment may also be lacking especially if the equipment was used previously for mite-infested spent fowl movement.

Cannibalism continues to be seen especially in high light intensity situation both caged and cage-free. In these cases, the 10-day rule for beak trimming result in longer beaks than desired compared to a beak trim at 4 to 8 weeks and results in an increase in incidence and severity of cannibalism. As this is a major problem for cage-free flocks, genetics companies are placing more emphasis on reducing this trait.

Focal duodenal necrosis (FDN), believed to be due to Clostridium colinum, is a widespread subclinical disease with lesions in the duodenum, and results in losses of egg weight gain and/or egg production depending on the severity of the infection. The use either of the antibiotics chlortetracycline or bacitracin is used successfully for treatment and/or prevention. Fermentation, probiotic, prebiotic, and botanical products are being evaluated for their usefulness in prevention of FDN.

MS is a very prevalent disease in multi-age complexes but has little significance in most cases due to its low pathogenicity. MG continues as an issue in multi-aged facilities and is successfully controlled in most cases.
through vaccination. Each complex must customize its vaccination program to control the strain on the farm. Ts-11 and 6/85 live vaccines are used for controlling mild strains of MG while F-strain live vaccine is being used to control more pathogenic strains. The live pox vectored recombinant MG vaccine is being used in a variety of situations and appears to be useful in low challenge situations. Vaccine failures with all vaccines are somewhat common and the unit must resort to medication programs using tylosin or tetracycline antibiotics. Some operators are now applying the F-strain vaccine by eyedrop in an effort to increase its efficacy.

Coccidiosis and necrotic enteritis continues as a problem in caged pullets and layers due to contamination of houses with coccidial oocysts from past outbreaks and delivery of these oocysts to the chickens in cages by flies or beetles. Coccidiosis vaccination of caged or cage-free pullets has met with challenges of high mortality due to poor uniformity of vaccine application and high litter moisture in cage-free housing.

Marek’s Disease was mentioned in the survey as being a minor problem. A handful of outbreaks have been seen in Pennsylvania and the Midwest and could mean a loss of effectiveness of the presently used HVT + Rispens vaccine. Improper vaccination administration and/or inadequate grow house cleaning and disinfection may also be the culprits. One outbreak this year in the Midwest led to 50% mortality by 30 weeks of age. Cage-free pullets tend to have more Marek’s Disease than caged pullets due to the inability to satisfactorily clean and disinfect some of the cage-free growing facilities.

Diseases under control and of low incidence are as follows: vaccinal infectious laryngotracheitis (vILT), IB, fowl coryza, and urolithiasis/gout. These diseases tend to be localized to a region or a farm. The pox vectored recombinant ILT vaccine has been determined to not be a replacement for chick embryo origin (CEO) vaccines in high challenge areas. The HVT-vectored ILT vaccine continues to show good results in high challenge regions and should reduce the amount of CEO vaccine used in layer flocks that may spread to broilers. Fowl coryza is a regional disease (Maine, southern California, Florida, and south Texas) and is controlled well by the use of commercial bacterin.

Diseases that are very rarely a problem for table egg layers are pox, Newcastle, infectious bursal disease, chick anemia virus, erysipelas, and fowl cholera. The area where the very virulent IBD outbreaks (vvIBD) are seen in northern California in December 2008 and May 2009 have not shown a recurrence of the disease.

The survey also asked about other issues and diseases of concern on a scale of 1 to 4 with 1 = low concern, 2 = some concern, 3 = moderately concerned, and 4 = very high concern. In the opinions of the 23 respondents, a high to very high level of concern (an average of 3 or more) was expressed for 1) banning of cages (3.71), 2) Salmonella enteritidis (SE) (3.42), 3) the lack of effective treatments (3.33), and 4) welfare issues overall (3.30). A level of some concern to high concern (average score of 2 to 3) was expressed for 1) on-farm euthanasia of spent fowl (2.70), 2) avian influenza...
(AI) (2.61), 3) beak trimming (2.35), 4) male chick disposal (2.22), 5) lack of effective vaccines (2.17), and 6) molting (2.09).

Poultry welfare concerns continue to be of high to very high concern due to continued activities by activist groups. A surprising event occurred this year as the United Egg Producers (UEP) and the Humane Society of the United States (HSUS) agreed to work together to establish federal legislation to require an eventual switch from conventional cage systems to enriched cage systems by 2029. This should lead to the use of enriched cages in California where the issue of which type of system would be approved according to the Prop 2 ballot initiative was undecided. This agreement also negated the ballot initiatives that were planned by HSUS in Washington state and Oregon.

The lack of effective treatments for diseases such as colibacillosis, necrotic enteritis, ascarids, *Capillaria spp.*, fowl cholera, etc. is a very high concern and a welfare issue for the diseases that can cause much suffering due to illness. The list of antibiotics that can be used in egg layers is quite short – bacitracin, tylosin, and chlortetracycline. The lack of an anti-parasitic product for used in controlling ascarids during lay, or other nematodes, is especially troublesome as these conditions are becoming increasingly common in cage-free production. Amprolium continues to be available to prevent and treat coccidiosis. Also, there is an increase in usage of non-antibiotic, preventative feed and water additives containing probiotics, prebiotics, and fermentation metabolites.

Concern for SE and its consequences continues due to the ongoing possibility of human outbreaks as occurred with the egg recall of 2010 involving two Iowa operations in August 2010. The Egg Safety Rule was implemented on July 9, 2010 for flocks over 50,000 layers. Flocks of between 3,000 and 50,000 have until July 2012 to comply. Many of the smaller operations are unprepared for the requirements of the program.

The FDA Egg Safety Program entails obtaining chicks from NPIP SE Clean breeders, rodent and fly monitoring and control programs, biosecurity, cleaning and disinfection of premises, training of persons involved, testing of manure samples at 14-16 weeks, 40 to 45 weeks, and 6 weeks after molt. If any of the manure tests are positive for SE, egg testing must take place. All testing and compliance efforts are funded by the producer. Laboratories have managed to gear up to handle the increased testing load this requires. Producers with a manure positive swab test are holding eggs from the market until after the test results of eggs are obtained. The use of DNA based tests are now being used that minimize the time of testing from the formerly required 10 days for culture to as low as 27 hours with the new tests. There is no provision in the program for compensating a producer who has an egg-positive flock and does not have a pasteurization or hard-cooking plant that will take their eggs. Producers are greatly ramping up measures to reduce risk of SE infection by increased use of vaccines, intestinal health
feed additives, rodent and fly control measures, and biosecurity practices as was intended by the plan.

Avian Influenza (AI) has fallen from very high concern to a high concern. Active and passive surveillance programs continue across the U.S. in response to the threat of high pathogenic H5N1 AI (HPAI) from Asia. As there is great concern in the layer industry in regard to the amount of time before egg movement can take place once quarantine is placed on a premise in a control zone, the industry and USDA have developed the Secure Egg Supply (SES) Plan that would allow movement of product within 48 hours after quarantine. This is done by assuring that a farm 1) has good biosecurity practices by being pre-approved, and 2) is negative for AI by a) testing five dead birds per house by AI real time PCR, and b) reporting daily mortality and egg production to the authorities. Discussion and research as to the best ways of bird euthanasia and disposal from large cage layer houses and complexes continues. The threat of H5 or H7 low pathogenic AI (LPAI) for layer flocks on the East coast is much reduced due to the efforts by NY and New Jersey Departments of Agriculture and USDA to reduce the positivity of the live bird markets from 60% positive markets in 2004 to near 0 since. No significant AI isolations have been made in layer flocks in the U.S. in the last year. A majority of egg operations are complying with the National Poultry Improvement Plan (NPIP) low pathogenic AI (LPAI) program for commercial layers.

Vaccine use continues to be the mainstay of disease prevention in the egg layer industry second to biosecurity. The supply of useful vaccines continues to be quite adequate and appears to be keeping up with the layer industry needs. It will be interesting to see if this good supply of vaccines continues with the consolidations now occurring in the poultry vaccine business.

The egg industry has experienced lower profits this year compared to last year. Feed price increases due to increases in corn, fat, and soymeal prices have hurt profits significantly. Some price increase was seen this summer due to heat losses involving both production and mortality. Iowa (52 million) continues to be the lead state in egg production followed by Ohio (27 million), Pennsylvania (24 million), Indiana (22 million), and California (19 million).
In preparation for this report to the USAHA Committee on the Transmissible Diseases of Poultry and Other Avian Species, the subcommittee chairman, Dr. Clark, and turkey industry colleagues, Dr. Corsiglia and Mr. Bailey, surveyed turkey industry professionals and veterinarians representing a majority of the U.S. turkey production regarding the health status of turkeys produced in August 2010 through August 2011. The turkey industry reports several disease challenges for this 12-month period varying by geographic regions within a state and across the United States. This report will list (Table 1) the challenges by disease and issues. Of particular interest in 2011 are lack of efficacious drugs and issues with cellulitis, turkey coronavirus, blackhead and reovirus. Turkey Reovirus Digital Flexor Tendon Rupture is recognized as a new emerging disease.

The “lack of approved efficacious drugs” continues to be the top disease issue (Table 1). The withdrawal of the NADA (New Animal Drug Application) for enrofloxacin in 2005 for use in poultry leaves the industry with no adequate therapeutic response to *coli bacillosis* (ranked #3, unchanged from prior year), or *fowl cholera* (ranked #20 from #15). The controversy over the use of antibiotics in animal agriculture remains a major concern for the turkey industry and for all of animal agriculture.

**Clostridial Dermatitis (CD),** previously referred to as *Cellulitis,* remains a major disease issue across all geographic regions; as the survey average decreased slightly to a score of 3.8 (from 4.0 in prior year) and ranked #2 (no change), from 3.8 (#2), 3.3 (#3) and 3.1 (#5) in 2009, 2008 and 2007, respectively. Analysis indicates range of concern; 71% of respondents score CD a 4 or 5 (severe), 12% score it a 2 or 1 (mild). CD is most commonly seen in, but not limited to, commercial male turkeys nearing market age. *Clostridium septicum,* *C. perfringens* type A, or *C. sordelli* is isolated from fluid or affected tissue samples of affected or dead birds. Affected turkeys present with two or more of the following signs: subcutaneous emphysema (crepitus); serous or serosanguineous subcutaneous fluid; vesicles on the skin, especially on the breast/inguinal area; moist, dark, wrinkled skin, especially breast/inguinal area; cellular necrosis (microscopic); organ involvement (spleen/liver); vesicles on the skin, and/or moist, dark, wrinkled skin, on the tail area. The affected flock will have mortality greater than or equal to 0.5 dead per 1,000-birds, fitting the individual bird definition, for two consecutive 24-hour periods. Research on the pathogenesis and control is on-going. Opinions vary as to risk factors and potential causes of the problem.
Poul enteritis of unknown etiologies has increased in importance, to position #6 from #7, with a score of 3.1 (from 2.9). Turkey Coronavirus (TCV), as a defined cause of enteritis, was ranked #34 (Table 1), decreasing from #25, with 70 reported cases (Table 2).

Late mortality ranked eighth (#8) health issue and decreased from #4 the prior year. Late Mortality may be defined as mortality, in excess of 1.5% per week, in toms (males) 17-weeks and older; mortality is not diagnosed to a specific disease or cause. Excess cumulative mortality of 5% – 10% in toms prior to slaughter has been reported. Late mortality may be associated with physiologic or biomechanical deficiencies following early rapid growth in heavy toms achieving genetic potential; aggressive behavior noted in mature toms; cannibalism; leg problems and/or hypertension.

Leg problems (#7, prior year was #5) are ranked among the top concerns of the turkey industry. Leg problems are a common complaint, such as spiral fractures of the tibia or femur. Leg Problems may be defined as lameness, particularly in toms, several weeks prior to slaughter. Leg problems are attributed to various conditions (refer to Table 1), including pododermatitis, fractured femurs, fractured tibia, osteomyelitis (OM), tibial dyschondroplasia (TDC), spondylolisthesis, “Shaky Leg”, etc.

Turkey Reovirus Digital Flexor Tendon Rupture (TR-DFTR) was recognized as a newly emerging disease. A reovirus has been isolated and identified as the cause of tenosynovitis and digital flexor tendon rupture in commercial turkeys. Clinical signs in young flocks are reportedly mild to nonexistent, but can develop into lameness and/or abnormal gait in older flocks, starting at about 12 weeks of age. Affected flocks may also report an increased incidence of aortic ruptures and poor flock performance (weight gain, uniformity). Research is on-going into pathogenesis, virus characterization, diagnostics and epidemiology. TR-DFTR was added to the survey this year and ranked #11 (Table 1) with 106 “confirmed” cases or flocks (Table 2). One respondent noted that their operation processed over 300 flocks with varying degrees of severity of this condition.

Blackhead, also known as Histomoniasis, decreased to position #14 in 2011 (#13, 2010; #11, 2009; #16, 2008; #22, 2007). It is one disease with no efficacious drug approved for use in turkeys. There were 89 reported cases of blackhead (Table 2) representing a 17% decrease from 2010. Losses to blackhead have been severe and sporadic cases are occurring in North America. The disease can be devastating in the individual flocks affected. Dimetridazole was extremely efficacious and previously approved for use in turkeys for the prevention and treatment of blackhead; it was banned in 1987. The lack of any legal treatment for histomoniasis is of concern, especially in the case of valuable turkey breeder candidate flocks. Losses to blackhead have been severe in several areas of Europe, and sporadic cases are occurring in North America. It seems unconscionable that we are unable to prevent the suffering and death in flocks affected by histomoniasis when effective treatments exist.
Heat stress ranked #4 following a hot summer, compared to #6 the prior year. Poult Enteritis Mortality Syndrome (PEMS ranked #33 versus #33 previously), Ornithobacterium rhinotracheale (ORT, ranked #12 versus #16 previously) and protozoal enteritis (#28 versus #22) and Avian Metapneumovirus (AmPV) ranked #31.

Mycoplasma synoviae (MS, infectious synovitis) infections ranked #27 (#28, prior year), and is one cause of synovitis. It may be present in flocks 10-12 weeks of age with typically low mortality and low morbidity. There were 39 cases of MS reported (Table 2) representing a 30% decrease from the prior year. The primary breeders have remained free of M. gallisepticum (MG), M. meleagridis (MM) and M. synovia (MS). Sporadic, but increasingly frequent infections with Mycoplasma, both MG and MS, often in association with backyard poultry and broiler breeder flocks is an ongoing concern, having the greatest impact when a breeder flock is infected and has to be destroyed.

Over the past 10 years the U.S. animal agriculture industry has been continually challenged with numerous attempts to ban the use of antibiotics in livestock and poultry. The current attempt at the federal level is with the [112th Congress] Preservation of Antibiotics for Medical Treatment Act of 2011, introduced into both the House and Senate [H.R.965.IH; S.1211.IS], otherwise known as PAMTA 2011. The turkey industry opposes PAMTA 2011, a bill that would devastate the ability to protect animal health by unnecessarily and inappropriately removing several classes of important antibiotics from the market. Prevention, control and growth promotion uses of antibiotics minimize the therapeutic use of antibiotics in livestock and poultry. The turkey industry welcomes honest discussion of science-based, pragmatic options allowing producers to farm in the best interests of their animals and customers while providing consumers assurance that our use of these vital, safe and effective production tools is professional, judicious and does not jeopardize these products’ effectiveness in human medicine.

The industry’s primary focus in 2011 continues to be the protection of the few drugs approved for use in turkeys. In 2010, the Food and Drug Administration Center for Veterinary Medicine published an advance notice of proposed rulemaking for the Veterinary Feed Directive, and a solicitation of public comments on a broad policy statement for industry entitled Draft Guidance #209, “The Judicious Use of Medically Important Antimicrobial Drugs in Food-Producing Animals.” The agency’s intent is to evaluate judicious use and veterinary oversight of antimicrobial drugs in food-producing animals, particularly those deemed medically important in human medicine. Following up on comments related to these documents, NTF evaluated a list of antimicrobial drugs that could be affected by any changes in FDA policy, and there are some key products that are at risk due to lack of therapeutic claims. A final version of the guidance document is expected in 2011. The industry has also been approached by the National Antimicrobial Resistance Monitoring System (NARMS) with requests to conduct on-farm
sampling of turkeys for the purpose of gathering additional data, but the logistics of such a program have yet to be sufficiently detailed, and the industry has not moved forward on such an initiative.

The industry also worked to help develop the Federal and State Transport (FAST) Plan for Movement of Commercial Turkeys in a High Pathogenicity Avian Influenza Control Area. The goal of the plan is to facilitate business continuity and economic survival of participating non-infected turkey operations in a Control Area after an outbreak of HPAI, and to help assure the continuous availability of safe turkey meat to consumers.

In 2010, the turkey industry continued to have frequent problems with green livers and suspect osteomyelitis (TOC, Turkey Osteomyelitis Complex) in processing plants. Given that the identification and removal of Turkey Osteomyelitis Complex (TOC) has been a concern for the industry for many years, in early 2011 NTF submitted a letter to FSIS requesting that the agency revisit the current policies on TOC identification, and to propose some potential solutions that might be more beneficial to the industry as well as to FSIS in-plant personnel. Although the agency has followed-up on the letter, they have not yet given a formal response.

In 2010, turkey production decreased to 7,107.28 million pounds from 7,149.46 million pounds (live weight) in 2009. This was the lowest production level since 2005. Overall domestic per capita consumption for turkey products decreased to 16.40 lbs in 2010 from 16.90 lbs in 2009. The preliminary number for 2011 is 16.10 lbs turkey consumption per capita, which is the lowest level since 1989. Production in 2010 decreased to 244.188 million head with an average live weight of 29.11 lbs. In 2009, 247.359 million head were produced with an average live weight of 28.90 lbs. In general, in addition to decreases in flock sizes, birds were marketed at a younger age on average. (Reference: National Turkey Federation Sourcebook, June 2011).

Table 1. Turkey health survey (August) of professionals in U.S. turkey production ranking current disease issues (1= no issue to 5 = severe problem). Survey response (reply) is 100% (n=26).

<table>
<thead>
<tr>
<th>Issue</th>
<th>Score Average (1-5)</th>
<th>Score Mode (1-5)</th>
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<tbody>
<tr>
<td>Lack of approved, efficacious drugs</td>
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<tr>
<td>Clostridial Dermatitis (Cellulitis)</td>
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<td>Leg Problems</td>
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<td>Late Mortality</td>
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<td>Bordetella avium</td>
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<tr>
<td>Breast Blisters and Breast Buttons</td>
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<td>Disease/Condition</td>
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<td>2010</td>
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<td>-------------------------------------------------------</td>
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<tr>
<td>Blackhead (Histomoniasis)</td>
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<td>108</td>
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<td><em>Mycoplasma synoviae</em> (MS)</td>
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Table 2. Turkey health survey (August) of professionals in U.S. turkey production. Survey response (reply) is 100% (n=26).
Table 3. Turkey research priorities (August) of industry professionals in turkey production (1= low to 5 = high). Survey response (reply) is 100% (n=26).

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<td>Waste Disposal</td>
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Update on the U.S. Poultry & Egg Association Research Grants Program

Henry Marks and Valerie Isaacs
U.S. Poultry Foundation Research Advisory Committee

Funding for research project proposals was limited to a single competition in 2010 as a result of a decline in the income of the USPOULTRY Foundation investments. However, in the current year (2011), two funding rounds were conducted (Spring and Fall). The Foundation Research Advisory Committee (FRAC) reviewed ~70 research proposals with 14 of those research proposals receiving approval by the Foundation Board of Directors. A total of $640,014 was granted in support of these research proposals. Plans are to return to having two competitions in 2012 (Spring and Fall).

Pre-proposals for the 2012 funding consideration are due November 1, 2011 (Spring competition) and May 1, 2012 (Fall competition). The FRAC will request full proposals after reviewing submitted pre-proposals. May 1 and November 1 have been established as permanent research project pre-proposal due dates. Plans are underway to develop additional funding to support research efforts of the USPOULTRY Foundation.

The following is an overview/summary of the U.S. Poultry & Egg Association Research Grants Program:

Table 1: USPOULTRY Research Grant Payments by Fiscal Year

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### Table 2: Institutions Receiving USPOULTRY Grants

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<th>University of Connecticut</th>
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<tr>
<td>Illinois Inst. of Technology</td>
<td>Russell Research Lab</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>Iowa State University</td>
<td>Southeast Poultry Research Lab</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>Johns Hopkins University</td>
<td>Southern Illinois University</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>Kansas State University</td>
<td>Texas A&amp;M University</td>
<td>University of Pennsylvania</td>
</tr>
<tr>
<td>Louisiana State University</td>
<td>Texas Tech University</td>
<td>University of Saskatchewan</td>
</tr>
<tr>
<td>Loyola College of MD</td>
<td>University of Arizona</td>
<td>University of Wisconsin</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>University of Arkansas</td>
<td>USDA-ARS</td>
</tr>
<tr>
<td>Mississippi State University</td>
<td>University of California, Davis</td>
<td>Virginia Tech</td>
</tr>
<tr>
<td>Montana State University</td>
<td></td>
<td>Washington State University</td>
</tr>
</tbody>
</table>

### Table 3: USPOULTRY Research Grants by General Subject

<table>
<thead>
<tr>
<th>Diseases</th>
<th>$9,040,927</th>
</tr>
</thead>
</table>

440
<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Safety</td>
<td>$3,591,995</td>
</tr>
<tr>
<td>Poultry Production</td>
<td>$4,190,687</td>
</tr>
<tr>
<td>Litter/Waste Management</td>
<td>$3,028,619</td>
</tr>
<tr>
<td>Further Processing</td>
<td>$1,011,000</td>
</tr>
<tr>
<td>Processing</td>
<td>$875,198</td>
</tr>
<tr>
<td>Poultry Nutrition</td>
<td>$655,000</td>
</tr>
<tr>
<td>Egg-related</td>
<td>$866,100</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$455,000</td>
</tr>
<tr>
<td>Egg Cholesterol</td>
<td>$155,000</td>
</tr>
<tr>
<td>Worker Health</td>
<td>$62,000</td>
</tr>
<tr>
<td><strong>Total Approximately</strong></td>
<td><strong>$23,931,526</strong></td>
</tr>
</tbody>
</table>
The U.S. animal agriculture and food systems are composed of extensive networks that supply wholesome, inexpensive food to people across the nation, whether they live in urban or rural settings. As food production and processing becomes separated geographically from the population centers, these complex systems become highly vulnerable to social, economic, and political disruptions. Introduction of a foreign animal disease has significant potential for disrupting the food supply chain and severely damaging the food system.

Many industries currently function using a Just-In-Time business model meaning that food products are processed and delivered to the consumer within hours or days of production. As a result, modern production and processing premises often have limited storage capacity designed to accommodate no more than 48 hours worth of production typically with product moving on a daily basis.

In the event of a foreign animal disease outbreak, “stop movement” orders are likely to be the initial regulatory response used to prevent the spread of disease. These “stop movement” orders potentially have wide geographic coverage resulting in serious unintended economic and social damage. It now has been widely accepted that emergency preparedness serves not only to control disease, but also to prevent or minimize unintended negative consequences to the food and agricultural systems. Called ‘business continuity’ or ‘secure food system’ planning, processes are employed to assess the relative risk of specific movements (proactive risk assessments) and establish a system to grant movements for non-susceptible species and commodities representing negligible risk of disease spread (permitting guidelines).

Currently, Public, Private, and Academic partners are working together to develop robust and resilient solutions that address the challenges associated with maintaining market continuity during foreign or emerging animal disease outbreaks. These partnerships are synergistic as no single sector can address these challenges alone. Understanding industry practices and movement is critical for accurate assessment of disease exposure pathways that contribute to risk. The development of permitting guidelines also requires state and national data systems for sharing of critical information that supports the needs of the disease control efforts and the Incident Command System. Active engagement of both industry and regulatory authorities is imperative in the development of market continuity plans. All stakeholders benefit in the development of these plans and the relationships that form as a result of the collaborations.

Benefits to market continuity planning: Market continuity planning has many benefits. It develops a common understanding between industry and regulatory authorities with regards to animal agriculture and disease
response; it identifies risks associated with the movement of product before the time of an outbreak; it supports National and State outbreak preparedness and response plans; and most importantly, it supports the security of the nation’s food supply.

I. Benefits to INDUSTRY (private)
- Enhances market continuity within and between States during an outbreak
- Supports regionalization, compartmentalization, and international trade
- Increases biosecurity and promotes flock health by understanding risk before an outbreak
- Facilitates early detection of disease and prevents spread

II. Benefits to REGULATORY AGENCIES (public)
- Guides decision makers on criteria needed to move product – permitting
- Supports the National Response Framework and Incident Command System
- Utilizes an internationally recognized approach for assessing risk
- Provides information on biosecurity levels and diagnostic tests
- Creates opportunity for regulatory authorities to understand needs of industry

III. Benefits to CONSUMERS
- Ensures a continuous supply of product
- Reduces work disruption and negative economic impacts for rural communities
- Promotes food security
National Poultry Improvement Plan Annual Report
Steve Roney, USDA-APHIS-VS


Pullorum-Typhoid Status: In FY 2011 (July 2010-June 2011) there were 2 isolations of Salmonella pullorum in the U.S. These were single bird isolations in backyard flocks only. There were no isolation/outbreaks of Salmonella pullorum (standard strain) reported during FY 2010. There have been no isolations of Salmonella gallinarum since 1988 in any type poultry. U.S. Pullorum-Typhoid Clean participating hatcheries include: 262 egg and meat-type chicken hatcheries, 37 turkey hatcheries, and 768 waterfowl, exhibition poultry and game bird hatcheries. NPIP U.S. Pullorum-Typhoid Clean Participating Breeding Flocks and Number of Birds are:

- **Egg-Type Chickens** 331 Flocks with 4,323,042 birds
- **Meat-Type Chickens** 6,471 Flocks with 215,155,414 birds
- **Turkeys** 634 Flocks with 5,395,467 birds
- **Waterfowl, Exhibition Poultry, and Game Birds** 2667 Flocks with 976,000 birds

Avian Influenza Status: In FY 2011 (July 1, 2010-June 30, 2011), there was an H7N9 isolated in turkeys in MN, an H7N3 from commercial turkeys in MO and an H5N2 and an H7N9 from backyard birds in NE.

Table 1: NPIP U.S. Avian Influenza Clean and U.S. H5/H7 Clean Participating Breeding Flocks; and U.S. H5/H7 Avian Influenza Monitored Participating Commercial Flocks:

<table>
<thead>
<tr>
<th>Subpart</th>
<th>Flocks</th>
<th>Birds</th>
<th>Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg-Type Chicken Breeders</td>
<td>331</td>
<td>4,323,042</td>
<td>31,866</td>
</tr>
<tr>
<td>Table-Egg Layers</td>
<td>2,134</td>
<td>132,359,664</td>
<td>42,950</td>
</tr>
<tr>
<td>Meat-Type Chicken Breeders</td>
<td>6,471</td>
<td>86,334,569</td>
<td>235,550</td>
</tr>
<tr>
<td>Meat-Type Chickens Commercial</td>
<td>73,856</td>
<td>6,277,760,221</td>
<td>1,929,622</td>
</tr>
</tbody>
</table>
Authorized Laboratories Activities: The University of GA Poultry Diagnostic & Research Center provides a quality assurance panel of convalescent contact infected chicken sera against MG and MS to Authorized Laboratories as a check test tool. The National Veterinary Services Laboratories issues a group D Salmonella check test and an avian influenza check test for the Agar Gel Immunodiffusion Test annually for Authorized Labs of the NPIP. Laboratory training provided to the Authorized Labs included two Salmonella Isolation and Identification Workshops, two Mycoplasma Diagnostic Workshops and one Avian Influenza Diagnostic Workshop for FY 2011.

<table>
<thead>
<tr>
<th>Turkey Breeders</th>
<th>634</th>
<th>5,395,467</th>
<th>18,422</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meat-Type Turkeys</td>
<td>13,955</td>
<td>96,356,888</td>
<td>153,940</td>
</tr>
<tr>
<td>Waterfowl, Upland Gamebirds, Ex. Poultry</td>
<td>4,869</td>
<td>28,538,680</td>
<td>106,165</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>102,250</td>
<td>6,631,068,531</td>
<td>2,518,515</td>
</tr>
</tbody>
</table>
AVIAN INFLUENZA

Live Bird Marketing System (LBMS). As part of the ongoing LBMS surveillance for presence of avian influenza virus (AIV) and avian paramyxovirus type-1 (APMV-1), the National Veterinary Services Laboratories (NVSL) tested 4,397 specimens in 761 submissions from 12 states (CT, FL, MA, MD, NE, NH, NJ, NY, OH, PA, RI, and WA) by virus isolation in embryonated chicken eggs and, when appropriate, by real-time RT-PCR (rRT-PCR). The surveillance is a collaborative effort between individual States and the United States Department of Agriculture (USDA). Presumptive positive specimens from rRT-PCR testing at state laboratories and specimens requiring virus isolation (environmental and cloacal swabs) were submitted to the NVSL for testing. All remaining LBMS surveillance specimens were tested at the State level.

In fiscal year (FY) 2011, AIV or APMV was isolated from 8.8% (67 of 761) of submissions and 2.6% (116 of 4,397) of specimens tested. AIV subtype H3N1 (New York, n=8), H3N8 (New Jersey, n=2) and H4 (Pennsylvania, n=1) were the subtypes of AI found in the LBMS this year. The remaining 105 viruses isolated were identified as APMV; 102 were APMV-1 from 8 states (Connecticut, Florida, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island, and Washington), one was APMV-4 from Ohio, and two were identified as pigeon paramyxovirus type-1 (PPMV-1) from NJ. Pathogenicity of representative APMV-1 isolates was determined by the intracerebral pathogenicity index (ICPI, n=29) test and/or by analysis of the deduced amino acid profile at the fusion protein cleavage site (n=62). All but two isolates were characterized as low virulent (lentogenic pathotype) strains; the two isolates were characterized as pigeon paramyxovirus type-1 (PPMV-1), a pigeon-adapted variant of Newcastle disease virus. In addition, an APMV-4 was identified in one duck specimen from Ohio.

Low Pathogenicity Avian Influenza (LPAI) in Commercial Poultry and Backyard Birds. Surveillance for AIV in commercial poultry is conducted under provisions of the National H5 and H7 Low Pathogenicity Avian Influenza Control Program implemented in September, 2006. Although most of the testing is performed locally, the NVSL provides reagents for the agar gel immunodiffusion (AGID) test and confirmation and identification testing of positive specimens. During FY 2011, two detections of notifiable LPAI in commercial poultry were reported to the World Organization for Animal Health (OIE). 1) Pre-harvest sampling from 2 Wright County, Minnesota commercial turkey flocks tested positive for H7N9 antibodies. An AIV subtype H7N9 was isolated from two specimens received from Premises 1, out of 18-week-old turkeys. A specimen from Premises 2, from 20-week-old turkeys, tested suspect positive by rRT-PCR for H7 viral
RNA. The H7 AIV was pathotyped as LPAI virus by the chicken pathogenicity test and amino acid sequence analysis of the hemagglutinin (H) cleavage site. Birds were depopulated by controlled marketing and euthanasia (foam application). 2) H7N3 antibodies were detected in a commercial turkey meat flock in Polk County, Missouri as a result of routine pre-slaughter surveillance. Suspect positive H7 rRT-PCR specimens were detected in one house. Turkeys were depopulated by control marketing and euthanasia (foam application). Pandemic H1N1 (pH1N1) viral RNA was detected by rRT-PCR in commercial turkeys in California. The specimen was positive for pandemic H1N1 virus by the modified matrix and pandemic N1 rRT-PCR assays, however no virus was isolated. For backyard (BY) poultry, routine surveillance at a consignment sale in Seward County, Nebraska in March detected AI H7 by rRT-PCR. The index flock was positive for H7 antibodies and AI H7 viral RNA but negative for virus isolation. Follow-up surveillance identified two infected flocks, one from which an H7N9 LPAI virus was isolated from guineas and one BY flock that was positive for H7 antibodies. The three infected flocks were depopulated. Additional antibody surveillance conducted within a two mile radius identified an additional two infected flocks which were depopulated. Both PCR and virus isolation tests were negative on samples tested from the H7 antibody positive flocks.

The NVSL received 578 submissions from commercial and backyard poultry for AI antibody confirmation and subtyping in FY11. NVSL detected influenza H1, H3, N1, and/or N2 antibodies in 397 commercial turkey submissions from 14 states (California, Iowa, Indiana, Michigan, Minnesota, Nebraska, North Carolina, New Hampshire, Ohio, Pennsylvania, Texas, Washington, Wisconsin, and West Virginia) in FY11. Detection data of additional LPAI AIV or AIV-specific antibodies in poultry/birds are shown in Table 1.

AI Diagnostic Reagents Supplied by the NVSL. During FY 2011, a total of 12,049 units of agar gel immunodiffusion (AGID) reagents (antigen and enhancement serum) were shipped to 64 state, university, and private laboratories in 37 states. The quantity is sufficient for approximately 1,445,880 AGID tests. An additional 773 units (92,760 tests) were shipped to 10 foreign laboratories. Proficiency panels for the AGID were shipped to 79 laboratories in 36 states to support the surveillance of AI by AGID.

rRT-PCR Proficiency Test Panels. The NAHLN laboratories conducting surveillance testing for AI and/or ND are required to have one or more diagnosticians pass an annual proficiency test (PT) to perform official rRT-PCR tests. In FY 2011, PTs were distributed to 278 diagnosticians in 55 laboratories for AI and to 273 diagnosticians in 55 laboratories for APMV-1 (Newcastle disease) rRT-PCR. The AI rRT-PCR proficiency panel included specimens for the detection of swine influenza, specifically pH1N1. In addition to NAHLN laboratories AI and ND rRT-PCR proficiency panels were
distributed to Brazil (3 AI/ND panels), Chile (2 AI/ND panels) and to 2 federal and 20 regional Mexican laboratories (22 AI/ND panels).

**AIV Surveillance in Wild Waterfowl.** The National Wild Bird Surveillance Program which was a cooperative USDA Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) and Department of Interior’s United States Geological Survey (USGS) was curtailed in March of 2011 due to lack of funding. Approximately 420 wild bird specimens were received in 2011 from 30 different states for confirmation, subtyping and characterization. No HPNAI H5N1 was detected; however, LPAI H5N1 virus was detected in specimens submitted from 4 states (Idaho, Minnesota, Ohio and Washington). A total of 62 H5 viruses (various N subtypes) and 49 H7 viruses (various N subtypes) were isolated and subtyped. Predominant H5 and H7 subtypes were H5N2 and H7N3. All H5 and H7 AIVs were characterized as LPAI viruses of North American lineage. Other AIV subtypes identified included H1, H2, H3, H4, H6, H8, H9, H10, H11, H12, H13 and H14.

**NEWCASTLE DISEASE**

**Isolations of Virulent Newcastle Disease Virus (vNDV).** In FY 2011, no vNDV was isolated from domestic poultry. Pigeon paramyxovirus type-1 (PPMV-1) was isolated from pigeons in PA and from pigeons from one import submission. Virulent NDV was isolated from wild cormorant specimens from FL (4 submissions), MI (1 submission) and OR (1 submission). All vND and PPMV-1 isolates were characterized by the intracerebral pathogenicity index (ICPI) and/or amino acid sequence analysis of the fusion protein cleavage site. In addition, all PPMV-1 isolates were identified by the HI test with monoclonal antibodies specific for PPMV-1.

**Isolations of Low Virulent Newcastle Disease Virus (LoNDV).** During FY 2011, 20 isolates of APMV-1 were received for characterization at the NVSL or were isolated at the NVSL from diagnostic submissions. The specimens originated from six states (Alabama, Delaware, Maryland, Minnesota, Missouri, and North Carolina). All of the isolates were characterized as LoNDV by the ICPI and/or by deduced amino acid motif at the fusion protein cleavage site.

**NDV Diagnostic Reagents Supplied by the NVSL.** During FY 2011, a total of 79 vials of LaSota APMV-1 inactivated antigen (2.0 ml per vial) and 14 vials of antiserum (2.0 ml per vial) for the hemagglutination-inhibition test were shipped to six and four state, university, and private laboratories, respectively. An additional four vials of each were shipped to four foreign laboratories.

**Table 1. Subtypes of non H5 or H7 low pathogenicity avian influenza virus (AIV) or specific antibodies detected in poultry/birds, FY 2011.**

<table>
<thead>
<tr>
<th>State</th>
<th>Species</th>
<th>Subtype of AIV* (number)</th>
<th>Antibody Subtypes (number)</th>
</tr>
</thead>
</table>

448
<table>
<thead>
<tr>
<th>State</th>
<th>Species</th>
<th>Viruses and Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>Pekin Ducks</td>
<td>H6N1,2,4* (1)</td>
</tr>
<tr>
<td>Florida</td>
<td>Ostrich</td>
<td>H11 (1) and N2 (2)</td>
</tr>
<tr>
<td>Iowa</td>
<td>Turkey</td>
<td>H11N9 (1)</td>
</tr>
<tr>
<td>Indiana</td>
<td>Turkey</td>
<td>H3N2* (1)</td>
</tr>
<tr>
<td>Michigan</td>
<td>Turkey</td>
<td>H1,3,4,11N1,2 (1)</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Turkey</td>
<td>H11N9 (48)</td>
</tr>
<tr>
<td>Minnesota</td>
<td>Pheasants</td>
<td>H6N1,8 (1)</td>
</tr>
<tr>
<td>Missouri</td>
<td>Turkey</td>
<td>H7N3 (1)</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Turkey</td>
<td>H1,3,5N1,2</td>
</tr>
<tr>
<td>Nebraska</td>
<td>Turkey/chicken</td>
<td>H7N9 (11)</td>
</tr>
<tr>
<td>Nebraska</td>
<td>Geese/guineas</td>
<td>H7N9** (3)</td>
</tr>
<tr>
<td>Oklahoma</td>
<td>Chicken</td>
<td>H10N7,9 (1)</td>
</tr>
<tr>
<td>Virginia</td>
<td>Show ducks</td>
<td>H4N6* (3)</td>
</tr>
</tbody>
</table>

*Low pathogenicity AIV by the chicken pathogenicity test.
**Low pathogenicity AIV by the chicken pathogenicity test and amino acid analysis of the hemagglutinin protein cleavage site.
Salmonella serotyping

The Diagnostic Bacteriology Laboratory within the National Veterinary Services Laboratories (NVSL) routinely serotypes Salmonella isolates submitted by private, state, and federal laboratories as well as veterinarians, researchers and other animal health officials. This report summarizes Salmonella serotyping submissions to NVSL from Jan. 1 through Dec. 31, 2010, originating from poultry. The Salmonella isolates are identified as clinical (clinical signs of salmonellosis from primary or secondary infection) or non-clinical (herd and flock monitoring programs, environmental sources, food). Serotyping data from isolates submitted for research purposes are not included in the summary. Salmonella serotyping at the NVSL is an ISO 17025 accredited test. Sera used for typing Salmonella isolates consists of polyvalent sera against the O serogroups and single factor sera against the individual O and H antigens. Approximately 50% of the sera used at the NVSL is produced in house as previously described (Ewing), and the rest is purchased from commercial vendors. All sera are subjected to quality control testing prior to use. Salmonella antigenic formulae are determined essentially as previously described (Ewing) and interpreted via the White-Kauffmann-Le Minor scheme (Grimont). The subspecies designation precedes the antigenic formula for those serotypes other than subspecies I. Those serotypes previously reported as “Arizona” are now listed with “III” (both monophasic and diphasic) followed by the antigenic formula. Those serotypes belonging to subspecies II or IV that had been previously named are now listed with their antigenic formula preceded by II or IV.

From Jan. 1 to Dec. 31, 2010 there were 4,987 isolates from chicken sources and 1,226 isolates from turkey sources submitted to NVSL for Salmonella serotyping. The most common isolates from chickens and turkeys, are listed in Tables 1 and 2 respectively.

The NVSL provided a Salmonella proficiency test in order for laboratories to assess their ability to isolate Salmonella from environmental samples and determine the serogroup of any Salmonella isolated. The samples consisted of drag swabs spiked with Salmonella and/or common contaminants. The 2011 test included Salmonella serotypes Enteritidis, Kentucky, Berta, Heidelberg, 9, 12:non-motile, Escherichia coli, E. coli (H₂S+), Citrobacter freundii, Pseudomonas aeruginosa, and Proteus mirabilis. The test consisted of 7 samples which were shipped to laboratories overnight on ice packs. Laboratories were instructed to use whatever protocol they choose and to report the results within 3 weeks. The NVSL randomly retained 10% of the test kits and tested them blindly for QA purposes. The results of the proficiency test are shown in Table 4.
Table 1: Most common serotypes in 2010: Chicken

<table>
<thead>
<tr>
<th>Serotype</th>
<th>No. Isolates</th>
<th>Serotype</th>
<th>No. Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteritidis</td>
<td>105</td>
<td>Enteritidis</td>
<td>1395</td>
</tr>
<tr>
<td>Typhimurium</td>
<td>35</td>
<td>Kentucky</td>
<td>866</td>
</tr>
<tr>
<td>Kentucky</td>
<td>20</td>
<td>Senftenberg</td>
<td>374</td>
</tr>
<tr>
<td>Heidelberg</td>
<td>13</td>
<td>Heidelberg</td>
<td>261</td>
</tr>
<tr>
<td>Senftenberg</td>
<td>7</td>
<td>Typhimurium</td>
<td>150</td>
</tr>
<tr>
<td>All others</td>
<td>64</td>
<td>Mbandaka</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tennessee</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infantis</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Typhimurium var 5-</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Montevideo</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All others</td>
<td>1242</td>
</tr>
<tr>
<td>Total</td>
<td>244</td>
<td>Total</td>
<td>4743</td>
</tr>
</tbody>
</table>

Table 2: Most common serotypes in 2010: Turkeys

<table>
<thead>
<tr>
<th>Serotype</th>
<th>No. Isolates</th>
<th>Serotype</th>
<th>No. Isolates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senftenberg</td>
<td>45</td>
<td>Senftenberg</td>
<td>223</td>
</tr>
<tr>
<td>Heidelberg</td>
<td>23</td>
<td>Hadar</td>
<td>100</td>
</tr>
<tr>
<td>Typhimurium</td>
<td>17</td>
<td>Ouakam</td>
<td>60</td>
</tr>
<tr>
<td>Albany</td>
<td>17</td>
<td>Orion</td>
<td>55</td>
</tr>
<tr>
<td>Ouakam</td>
<td>17</td>
<td>Muenster</td>
<td>51</td>
</tr>
<tr>
<td>All others</td>
<td>126</td>
<td>Montevideo</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kentucky</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Worthington</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agona</td>
<td>34</td>
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<tr>
<td></td>
<td></td>
<td>Saintpaul</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All others</td>
<td>285</td>
</tr>
<tr>
<td>Total</td>
<td>245</td>
<td>Total</td>
<td>981</td>
</tr>
</tbody>
</table>

Table 3: Summary of the NVSL *Salmonella* proficiency test

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
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<tbody>
<tr>
<td>Participants</td>
<td>40</td>
<td>55</td>
<td>70</td>
</tr>
<tr>
<td>Mean Score</td>
<td>93%</td>
<td>92%</td>
<td>97%</td>
</tr>
<tr>
<td>Score Range</td>
<td>100-44%</td>
<td>100-44%</td>
<td>100-85%</td>
</tr>
<tr>
<td>Below Passing</td>
<td>4</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

*Salmonella* Enteritidis

The number of *Salmonella* Enteritidis (SE) isolates submitted from chickens in 2010 is shown in Table 4. The most common SE phage types are shown in Table 5.
In July 2010, the NVSL implemented a rapid SE Rule Out test in order to help customers comply with the FDA Egg Rule. The test indicates if a submitted isolate is SE or not, and the results are typically reported within two business days. 174 isolates were submitted for SE rule out testing; 163 were SE positive.

### Table 4: Number of chickens *Salmonella* Enteritidis isolates per calendar year at the NVSLuxcerza

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. chicken isolates</td>
<td>4579</td>
<td>4971</td>
<td>6164</td>
<td>4761</td>
<td>4987</td>
</tr>
<tr>
<td>No. chicken SE isolates</td>
<td>437</td>
<td>580</td>
<td>876</td>
<td>993</td>
<td>1500</td>
</tr>
<tr>
<td>SE percent of all isolates</td>
<td>9.5%</td>
<td>11.7%</td>
<td>14.2%</td>
<td>20.9%</td>
<td>30.1%</td>
</tr>
</tbody>
</table>

### Table 5: Most common *Salmonella* Enteritidis phage types from chicken sources per calendar year

<table>
<thead>
<tr>
<th>Rank</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8 (156)</td>
<td>8 (103)</td>
<td>8 (240)</td>
<td>8 (131)</td>
<td>8 (182)</td>
</tr>
<tr>
<td>2</td>
<td>13 (96)</td>
<td>13 (29)</td>
<td>13 (82)</td>
<td>13 (54)</td>
<td>13 (90)</td>
</tr>
<tr>
<td>3</td>
<td>23 (16)</td>
<td>23 (16)</td>
<td>23 (58)</td>
<td>13a (19)</td>
<td>13a (65)</td>
</tr>
<tr>
<td>4</td>
<td>4 (12)</td>
<td>13a (15)</td>
<td>13a (43)</td>
<td>23 (10)</td>
<td>RDNC (27)</td>
</tr>
<tr>
<td>5</td>
<td>13a (8)</td>
<td>22 (1)</td>
<td>RDNC (10)</td>
<td>RDNC (4)</td>
<td>23 (11)</td>
</tr>
<tr>
<td>Total typed</td>
<td>297</td>
<td>167</td>
<td>444</td>
<td>228</td>
<td>408</td>
</tr>
</tbody>
</table>

( ) = number of isolates for each phage type
RDNC = reacts, does not conform

**Salmonella Pullorum**

The NVSL provided 2,120 ml of *S. Pullorum* tube antigen, 1,775 ml of *S. Pullorum* stained microtiter antigen, and 247 ml of antisera to testing laboratories. The NVSL conducted 139 *S. Pullorum* microtiter tests. The NVSL did not identify any isolates of *S. Pullorum* via serotyping in 2010.

**Pasteurella and Mycoplasma**

NVSL received 106 isolates for somatic typing in 2011, a decrease from 2010 (Table 6). NVSL also supplied 85 ml of *P. multocida* typing sera, an increase from 40 ml in 2010. The amount of *Mycoplasma* reagents are shown in Tables 7 and 8.
Table 6: *Pasteurella multocida* somatic typing. Table shows number of isolates per fiscal year for each type.

<table>
<thead>
<tr>
<th>Type</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 3</td>
<td>46</td>
<td>54</td>
<td>38</td>
<td>25</td>
</tr>
<tr>
<td>Type 3,4</td>
<td>39</td>
<td>33</td>
<td>27</td>
<td>12</td>
</tr>
<tr>
<td>Type 1</td>
<td>33</td>
<td>14</td>
<td>25</td>
<td>17</td>
</tr>
<tr>
<td>All other</td>
<td>80</td>
<td>62</td>
<td>70</td>
<td>52</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>198</td>
<td>163</td>
<td>160</td>
<td>106</td>
</tr>
</tbody>
</table>

Table 7: *Mycoplasma* antisera (ml) provided by NVSL per fiscal year

<table>
<thead>
<tr>
<th>Antisera</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>M. gallisepticum</em></td>
<td>374</td>
<td>340</td>
<td>266</td>
<td>256</td>
<td>306</td>
</tr>
<tr>
<td><em>M. meleagridis</em></td>
<td>74</td>
<td>120</td>
<td>54</td>
<td>32</td>
<td>54</td>
</tr>
<tr>
<td><em>M. synoviae</em></td>
<td>342</td>
<td>346</td>
<td>222</td>
<td>256</td>
<td>326</td>
</tr>
<tr>
<td>Negative</td>
<td>136</td>
<td>252</td>
<td>162</td>
<td>222</td>
<td>150</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>926</td>
<td>1058</td>
<td>704</td>
<td>766</td>
<td>836</td>
</tr>
</tbody>
</table>

Table 8: *Mycoplasma* antigen (ml) provided by NVSL per fiscal year

<table>
<thead>
<tr>
<th>Antigen</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>M. gallisepticum</em></td>
<td>515</td>
<td>390</td>
<td>190</td>
<td>150</td>
<td>195</td>
</tr>
<tr>
<td><em>M. meleagridis</em></td>
<td>120</td>
<td>150</td>
<td>75</td>
<td>75</td>
<td>95</td>
</tr>
<tr>
<td><em>M. synoviae</em></td>
<td>610</td>
<td>510</td>
<td>200</td>
<td>215</td>
<td>220</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1245</td>
<td>1050</td>
<td>465</td>
<td>440</td>
<td>510</td>
</tr>
</tbody>
</table>


The Poultry 2010 study is the fourth poultry study conducted by the National Animal Health Monitoring System (NAHMS). The study objectives were:

- **Describe the structure of commercial poultry industries (broiler, layer, turkey, and primary breeder), including interactions, movements, and biosecurity practices.** Describe farm level practices for layer and broiler primary breeder and multiplier flocks. Identify critical factors for exclusion of disease (such as Mycoplasma or ILT).
- **Estimate the prevalence and identify risk factors associated with Clostridial dermatitis (cellulitis/gangrenous dermatitis) on turkey grower farms.**
- **Estimate the size of the urban chicken population in Los Angeles County.** Describe bird health, movement, and biosecurity practices of urban chicken flocks in 4 U.S. cities – Los Angeles, Miami, Denver, and New York.

**Breeder farm study:** Companies having table egg layer breeder farms or broiler breeder farms participated in the breeder farm study. Questionnaires addressing biosecurity and management practices were completed for 482 breeder farms. All primary breeder farms required the producer and employees to change clothing, change shoes or use shoe covers, to not have been around poultry at least 24 hours, and to not own poultry or birds, and nearly all required showers before entering the poultry houses. Over 8 of 10 multiplier farms required the producer and employees to use footwear protection, not be around other poultry, and to not own poultry or birds. Very few disease problems were reported for breeder farms, the most common being *E. coli* peritonitis; 22.7 percent of farms reported at least a slight problem with *E. coli* peritonitis in the last completed flock.

**Clostridial dermatitis study:** Clostridial dermatitis was reported on approximately one in 4 broiler farms, with less than 1% of farms having severe problems. Turkey farms in the Central region had the highest percentage of farms with some degree of clostridial dermatitis problems during the previous 12 months: about half had some degree of disease, and 17.6% had severe disease. No turkey farms in the West region had clostridial dermatitis problems. Analysis of risk factors via a case-control study is on-going. A subset of case and control farms provided weekly biologic samples for culture as well as intestinal histopathology, in order to study the relationship between intestinal pathology and disease pathogenesis. Laboratory analysis is on-going.

**Urban chicken study:** A mail/phone survey of residents of Los Angeles County was conducted to estimate the size of the urban chicken population. Approximately 1% of residences on less than one acre had chickens present. A survey of urban chicken owners was conducted in Los Angeles, Denver, New York City, and Miami to describe management practices of urban...
chicken flocks. Customers purchasing chicken feed at feed stores in Los Angeles, Denver, and Miami completed a short questionnaire. In New York City, the survey was administered to members of a chicken club via the club’s web site.

Chicken owners in Los Angeles and Miami were more likely to complete the study questionnaire in Spanish, have a longer history of raising chickens, and have larger flock sizes than owners in Denver and New York City. They were also more likely to have chicken breeds other than table egg breeds and to have birds other than chickens. Family tradition was a more important reason to raise chickens for owners in Los Angeles and Miami compared with owners in Denver and New York City, while food source and food quality were more important to owners in Denver and New York City. Overall, 46% of urban chicken owners were aware of a connection between contact with live poultry and Salmonella, and 29.4% had heard of “Biosecurity for Birds.”

**Future plans:** The size of the urban chicken population will be estimated in Denver, New York City, and Miami in 2012. A study of table egg layer farms focusing on practices related to Salmonella Enteritidis will be conducted in 2013.

The objectives of this plan are to identify (1) the capabilities needed to respond to an HPAI outbreak and (2) the critical activities that are involved in responding to that outbreak, and time-frames for these activities. These critical activities are the responsibility of Incident Command in an outbreak situation.

This plan protects public health, promotes agricultural security, secures the food supply, and guards animal health by providing strategic guidance on responding to an HPAI outbreak. Developed by the National Center for Animal Health Emergency Management of the Animal and Plant Health Inspection Service (APHIS), the plan gives direction to emergency responders at the local, State, Tribal, and Federal levels to facilitate HPAI control and eradication efforts in poultry in the United States. This plan complements, not replaces, existing regional, State, Tribal, local, and industry plans.

HPAI is zoonotic, and while it appears to have a relatively high species-specific transmission barrier, it also can be fatal for humans. Less than 1,500 cases of avian influenza infection in humans have been documented in the last 50 years. Animal health officials will coordinate with public health officials in the event that HPAI is identified in the United States.

HPAI virus causes extremely high morbidity and mortality rates in poultry, and is highly contagious. Currently, there is no evidence that HPAI exists in the United States in domestic poultry. HPAI subtype H5N1 does exist in much of Asia and in parts of Europe and Africa. HPAI is easily spread through direct contact with sick or infected poultry, as well as via fomites, such as equipment and vehicles. An HPAI outbreak in the United States could have a major economic impact. In addition to the potential public health threat, there may also be a significant social and psychological impact on flock owners.

The goals of an HPAI response are to: 1) detect, control, and contain HPAI in poultry as quickly as possible; 2) eradicate HPAI using strategies that seek to protect public health and stabilize animal agriculture, the food supply, and the economy; and 3) provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products.

Achieving these three goals will allow individual poultry facilities, States, Tribes, regions, and industries to resume normal production as rapidly as possible. They will also allow the United States to regain disease-free status.
without the response effort causing more disruption and damage than the disease outbreak itself.

During an HPAI outbreak response effort, many activities—such as epidemiology, surveillance, biosecurity, quarantine and movement control, and depopulation—must occur in a deliberate, coordinated fashion. In addition to providing strategic direction on these various activities, this plan explains the underlying Incident Command System structure, applying the National Response Framework (NRF) and National Incident Management System (NIMS) principles and systems to control and eradicate an outbreak of HPAI in the domestic poultry population.

The United States’ primary control and eradication strategy for HPAI in domestic poultry, as recommended by the World Organization for Animal Health (OIE), is “stamping-out.”

Incorporating current scientific knowledge and policy guidance about HPAI, the HPAI Response Plan:

• identifies the audience for and purpose of the document;
• provides technical information on HPAI and the impact an HPAI outbreak could have in the United States;
• explains the integration of the NRF, NIMS, and the other Foreign Animal Disease Preparedness and Response Plan (FAD PReP) documents; describes U.S. Department of Agriculture preparedness and response activities, both domestic and international, including collaboration with public health agencies and the APHIS Incident Management Structure;
• presents 23 specific response critical activities and tools, such as surveillance, diagnostics, cleaning and disinfection, health and safety, personal protective equipment, and depopulation;
• details OIE standards for HPAI surveillance, virus inactivation, and disease freedom; and
• supplies information on proof-of-freedom procedures and restocking after an HPAI outbreak.

This response plan is carefully integrated with other FAD PReP documents, including the HPAI Standard Operating Procedures and National Animal Health Emergency Management System Guidelines. Together, these documents provide a comprehensive preparedness and response framework for an HPAI outbreak.

Public health information about avian influenza and humans can be found at http://www.cdc.gov/flu/avian.

Please visit the FAD PReP collaboration website, which promotes preparedness relationships and advances response capabilities. The website is at: https://fadprep.lmi.org.

This plan is a dynamic document that will be updated and revised based on future knowledge and further stakeholder input. Your comments and recommendations on this document are invited. Send them to the following e-mail address: FAD.PReP.Comments@aphis.usda.gov.
Antigenic variation has become a major concern with the proper application of vaccination for highly pathogenic H5N1 avian influenza. Vaccine experiments were performed to evaluate the efficacy of killed oil adjuvanted vaccines against highly pathogenic H5N1 from Egypt. The data compared a homologous strain, a reverse genetics produced vaccine with a H5 gene from a Vietnam isolate, and a vaccine using a low pathogenic H5N2 Mexican strain. The results showed the Mexican strain vaccine, although producing the highest titers, had poor protection with high mortality. The vaccine with the Vietnam insert, although having lower antibody titers, had intermediate protection. The homologous vaccine, although with the lowest antibody titers had the best protection. The data clearly shows that the antigenic drift of at least some viruses from Egypt was so great that several commonly used vaccines no longer provided sufficient protection. For acceptable vaccine protection, the vaccine needs to be closely matched to the field strain.

The overwhelming majority of AI vaccines produced and sold are inactivated whole virus formulated into an oil emulsion. However, recombinant vectored vaccines are gaining popularity. In this study, we compared protection of chickens provided by a recombinant turkey herpesvirus (rHVT) vaccine expressing the HA gene from a clade 2.2 H5N1 strain (A/swan/Hungary/4999/2006) against homologous H5N1 and heterologous H5N1 and H5N2 HPAI challenge. For homologous challenge, groups of birds were vaccinated at day of age subcutaneously and challenged four weeks later with A/whooper swan/Mongolia/L245/2005. The results demonstrated all vaccinated birds were protected from clinical signs of disease and mortality following homologous H5N1 challenge. In addition, oral and cloacal swabs taken from challenged birds demonstrated that vaccinated birds had lower titers of viral shedding compared to sham-vaccinated birds. To examine protection against a genetically distant HPAI, birds were challenged with either a H5N1 of Indonesian origin or a H5N2 HPAI Mexican isolate. In these studies, at least 80% of vaccinated birds survived challenge, with few birds shedding virus after challenge. Taken together, these studies provide support for the use of rHVT vaccines expressing HA to protect poultry against multiple lineages of HPAI.

The pathogenicity of H5N1 highly pathogenic avian influenza (HPAI) viruses in domestic ducks has increased over time. These changes in virulence have been reported with viruses from countries with high population of domestic ducks including Vietnam and Egypt. In order to understand which viral genes are contributing to the increase in virulence of H5N1 HPAI viruses in ducks, reverse genetics was used to generate single-gene reassortant viruses with genes from H5N1 HPAI viruses of different pathogenicity. Intranasal inoculation of two-week-old domestic Pekin ducks with these
reassortant viruses demonstrated that more than one viral gene is involved in the increased pathogenicity of H5N1 HPAI viruses in ducks.

The relative sensitivity of different swab types was compared by collecting cloacal and oropharyngeal swabs from chickens experimentally infected with a low pathogenicity H7N2 AIV isolate at multiple time points post infection (PI). Three swab material types were compared including: nylon (dacron) (the current type recommended by APHIS), flocked nylon, and urethane foam, as each has different absorbance and release properties. Samples have been processed for real-time RT-PCR (rRT-PCR) for samples collected 1-4 days PI. Initial analysis of the rRT-PCR results shows that there may be improved detection of AIV with flocked swabs for oral samples and foam swabs with cloacal samples. Real-time PCR results show that 100% of oral samples collected were positive, however the cycle threshold values, which indicates the amount of virus recovered in the specimen, showed statistically significant higher amounts of virus recovery on days 1 and 3 PI with flocked swabs versus either foam or non-flocked swabs. With cloacal swabs collected 1-4 days PI there was a trend for cycle threshold values to be lower with foam swabs. This difference was only statistically significant among swab types at 1, 3 and 4 days PI. Importantly the proportion of positive birds by cloacal swabs was similar among all three swabs types.

The biggest controversy in Newcastle disease virus research is whether traditional NDV vaccines, such as B1 and LaSota, are able to protect against the newer virulent NDVs. There are genetic differences among NDV isolates, even though they are all one serotype, but we have shown that you can reduce the amount of virulent NDV shed from vaccinated birds by having the vaccine be more genetically similar to the outbreak virus. In our laboratory, under experimental conditions using SPF chickens, LaSota vaccines protected birds from death and disease against three diverse virulent viruses.

Two unusual viruses were isolated by NVSL. One from an unknown avian species at a live bird market in FL in 2007 and a few others from MN turkeys in 2009. While they both only have two basic amino acids between positions 113-116, oddly they both have an “F” at position 117. One is most similar to genotype I viruses from wild birds and the other is most similar to genotype II NDV isolates from wild birds. The ICPI in chickens is very low. The viruses seem to grow better in turkey eggs (ETE) than in chicken eggs. Only one other known naturally occurring lentogenic NDV has an F at position 117 and that is isolate PR 32 (Peats Ridge, Australia) that was an intermediate virus during the virulent outbreak of 1998.

In order to characterize the un-described viruses present in the turkey gut, we utilized the Roche/454 Life Sciences GS-FLX pyrosequencing platform to compile an RNA virus metagenome from turkeys experiencing enteric disease. This approach yielded numerous sequences homologous to viruses in the nr protein database (GenBank), many of which have not been described in turkeys, including sequences from the dsRNA viruses (Reoviridae and Picobirnaviruses), and the ssRNA viruses (Caliciviridae,
Leviridae, Picornavirales, and Astroviridae). The majority of the assigned viral contigs showed similarity to database sequences from the Picornavirales order. These results validate this metagenomic approach to identifying known and novel RNA viruses in the poultry gut.

In order to directly confirm the presence of these novel picobirnaviruses (PBVs) in the poultry gut, an RT-PCR based assay targeting the PBV RNA-dependent RNA-polymerase (RdRp) was developed. Serial dilution of the dsRNA was used to determine the sensitivity of the assay and RT-PCR with isolated RNA from known enteric viruses (avian revovirus, rotavirus and astrovirus) was used to determine potential cross-reactivity. No cross-reactivity was seen with isolated enteric virus RNA or with total RNA extracted from control turkey intestinal homogenates. The sequence data generated via this approach will prove useful in a continuing, in-depth molecular characterization of the viral constituency of the poultry gut. This will facilitate the development of updated molecular diagnostic tests, plus a more thorough knowledge of the viral constituency in the poultry gut has the potential to provide the tools necessary to lead to a better understanding of the role viruses play in enteric disease and in the performance of poultry in general.

Avian metapneumovirus (aPMV) is a poultry virus that is the causative agent of turkey rhinotracheitis in turkeys and swollen head syndrome (SHS) in chickens. Though the virus causes low mortality in poultry, the high morbidity can lead to significant economic impact in the industry. The aMPV cell attachment glycoprotein is an envelope protein that is immunogenic and a good vaccine candidate. Using an infectious clone derived from the LaSota strain of Newcastle Disease (NDV) virus, a reverse genetics approach was used to insert the aMPV cell attachment glycoprotein (G) into the LaSota pFLC backbone. This infectious clone was used to generate recombinant virus that could be used as a bivalent vaccine (rVaccine) to potentially protect against NDV and aMPV. It was determined that the recombinant vaccines with the G protein insert grew to the same titers as the NDV LaSota vaccine strain. Versions of this recombinant vaccine expressing the G protein from the different aMPV subtypes were used to inoculate one week old SPF turkeys with the NDV LaSota strain used as a control. The recombinant vaccines all protected the turkeys from a challenge with a velogenic (CA02) strain of NDV. The turkeys that were vaccinated with the recombinant vaccine expressing the G protein from the aMPV C subtype were challenged as well with wild-type aMPV-C (Colorado). The recombinant vaccine did not fully protect the birds from aMPV-C infection, although clinical signs were reduced in vaccinated birds. These recombinant vaccines replicate well in birds, and have been shown to express the G-glycoprotein; however, while they provide full protection to velogenic NDV, they provide only partial protection against homologous aMPV challenge.

Current research indicates that meleagrid herpesvirus type 1 (MeHV-1, now known as turkey herpesvirus, HVT) is an excellent vector for the expression of avian immunogens. Classical methods using marker rescue
approaches are often time consuming and require the inclusion of undesirable additional genetic material (antibiotic resistant, green fluorescent protein, etc). Generation of vaccine candidates using the recombination machinery of *E. coli* would minimize these problems. The object of this study was to clone a chicken codon-optimized gene encoding VP-2 of chicken parvovirus into an HVT-based transfer plasmid. The VP-2 gene of chicken parvovirus was codon-optimized to ensure strong expression of the protein in the chicken; this approach improved expression of VP-2 in this system. This transfer plasmid was used to inoculate chickens intramuscularly, resulting in a measurable antibody response measured via a VP-2 specific ELISA assay.
Research Update: Avian Disease and Oncology Laboratory Avian Tumor Viruses
Aly Fadly, Hans Cheng, John Dunn, Mohammad Heidari, Henry Hunt, Lucy Lee, Robert Silva and Huanmin Zhang
USDA-ARS Avian Disease and Oncology Laboratory

Genomics and Immunogenetics

Marek’s disease (MD), a lymphoproliferative disease caused by the highly oncogenic herpesvirus Marek’s disease virus (MDV), continues to be a major disease concern to the poultry industry. The fear of MD is further enhanced by unpredictable vaccine breaks that result in devastating losses. The field of genomics offers one of the more exciting avenues for enhancing control of MD. By identifying genes that confer genetic resistance, it should become possible to select for birds with superior disease resistance. Genetic resistance to MD is a complex trait controlled by many genes. Identification of these genes is a major challenge despite the existence of the chicken genome sequence and ever increasing number of tools, especially next generation sequencing. Thus, we have been implementing and integrating genomic approaches that identify QTL, genes, and proteins that are associated with resistance to MD. The rationale for using more than one approach is that the strengths of each system can be combined to yield results of higher confidence. Another justification is that given the large volume of data produced by genomics, each method provides an additional screen to limit the number of targets to verify and characterize in future experiments. Our combined approaches of: 1) sequencing of MD resistant and susceptible chicken lines to identify genomic regions under selection for MD incidence, 2) chromatin immunoprecipitation followed by sequencing (ChIP seq) to identify MDV Meq and chicken c-Jun binding sites, 3) gene expression profiling between cell lines to identify genes and pathways regulated by MDV Meq, and 4) allele-specific expression screens by RNA sequencing to identify genes with differential allele response to MDV infection have identified 97 high-confidence candidate genes that are directly regulated by MDV Meq and help explain differences in genetic resistance to MD. If confirmed, these genes and their associated genetic markers would be ideal candidate for genomic selection.

Genetics Effect on Vaccine Efficacy. Since their invention, vaccines have proven to be the most effective and economical method to combat infectious diseases in humans as well as in livestock. Efforts to improve vaccine protective efficiency have continued and expanded. Host genetics differences were investigated for the influence on MD vaccine efficacy using unique genetic lines of chickens. Our data suggests that host genetics play an important role influencing MD vaccine protection efficiency. Continuous analyses of our research data further suggested that different genetic lines of chickens respond to the same one vaccine with different protective efficiency.

Marek’s Disease Virus Evolves to Higher Virulence in Birds with Limited Genetic Variation. MD is still a major concern as MDV continues to evolve to
higher virulence. Most studies addressing the evolution of MDV virulence have concentrated on the virus while largely ignoring the hosts’ influence. The host system called the major histocompatibility complex (MHC) represents a highly polymorphic system designed to defend the species from extinction by the fast paced evolution of a parasite. In natural chicken populations, there are hundreds of different MHC haplotypes that oscillate in response to pathogen evolution, but commercial poultry breeding has limited the number of MHC haplotypes to six or less. Our current work has shown that MDV can evolve to higher virulence in birds with a single MHC haplotype. Thus, we predict the best way to reduce the chronic problem of MD incidence in commercial chickens is to rotate the placement of MHC haplotypes similar to the simple method of crop rotation used to control pests in the field. Incorporation of this method into modern poultry production may greatly reduce future virus evolution resulting in substantial savings to the poultry industry.

**Marek’s Disease**

**Transient Paralysis (TP).** A neurological disorder associated with MDV infection. Highly pathogenic strains of MDV are capable of inducing TP even in the resistant line 6-3. This year, we investigated the mechanism of TP in both resistant and susceptible chicken lines inoculated with a vv+ strain of MDV. Gene expression profiling indicated that IL-1β, IL-4, and IL-8 were down regulated in the brain tissues of birds from line 7-2 exhibiting TP symptom. Vaccination prior to challenge prevented the suppression of these cytokines. IL-10, an anti-inflammatory cytokine was significantly up-regulated in the infected line 7-2 birds with or without TP. This strong activity of IL-10 had resulted in severe suppression of MHCII transcripts. Overall immunity measured in the brain tissues of birds from both resistant and susceptible lines with and without TP indicated that the immune response to MDV infection is much more vigorous in line 6-3 than line 7-2. Differential expression of immune-related gene provides insight into possible modulation of the immune system toward an effective T cell mediated immune response against MDV infection using cytokine and chemokines as genetic adjuvant. This information is important for understanding the pathogenesis of TP.

**Surveys and Pathotyping.** In our attempts to survey field flocks for MDV of unusual pathogenicity, we have received blood samples from Rispens-vaccinated layer and broiler breeder flocks experiencing high Marek’s disease mortality in Pennsylvania and Iowa. Two Pennsylvania virus isolates from 2010 pathotyped as v and vv+MDV and interestingly shared a specific mutation in the MDV pp38 gene similar to Pennsylvania isolates from 2007 and 2009. Although the pathotyped strains were not unusually virulent, this unique mutation in combination with problems in several surrounding flocks indicate there may be a mutated MDV strain circulating in Pennsylvania. MD remains a problem in this area and we have recently isolated virus from additional layer flocks in this same area of Pennsylvania in 2011. In addition we have received samples in 2011 from a broiler breeder flock in
Pennsylvania as well as from a layer flock in Iowa experiencing high mortality. Pathotyping experiments are currently ongoing for selected 2011 isolates. This study will determine if the mortality in the affected flocks can be attributed to virus evolution and the presence of the virus mutation in the pp38 gene may be useful for understanding the epidemiology of mutated virus strains.

**Vaccines.** Although deletion of Meq gene of MDV rendered the virus non oncogenic and was shown through experimental and field trials to be an efficacious vaccine, it still induces lymphoid organ atrophy like that of the parental virus, rMd5, in maternal antibody negative chickens. This year, we developed a method to rid this most effective vaccine against MD from a serious side effect, namely immunosuppression. We have generated 80 cell culture passages of rMd5Δ meq viruses and found no significant lymphoid organ atrophy beginning at 35th passage onward when compared with un-inoculated control chickens; this development will assist vaccine manufacturers to proceed with their plans for commercializing the vaccine. In other experiments, we also found that the ability of a virus to induce thymic atrophy directly correlated with the virus’s capacity to replicate to high titers in the thymus, suggesting that ability of MDV to induce tumors and disease is separate from its ability to induce atrophy.

**Avian Leukosis.** Chickens from Avian Disease and Oncology Laboratory (ADOL) line alv6 that is known to be resistant to infection with subgroups A and E avian leukosis virus (ALV) were vaccinated at hatch with a trivalent MD vaccine containing serotypes 1, 2 and 3 MD viruses, and were maintained under specific-pathogen free (SPF) conditions from the day of hatch until 56 weeks of age. Lymphoid leukosis tumors were detected in several chickens that died after 20 weeks of age. Chickens tested negative for all subgroups of exogenous ALV and for antibodies against ALV of subgroup of A, B and J. Also, tumor tissues tested negative by PCR for the presence of infectious ALV of subgroups A, E, and J. Results suggest the development of spontaneous LL in SPF white leghorn chickens that are resistant to subgroup A and E ALV. The role of using MD vaccines containing all serotypes of MD virus in the development of these tumors remains to be determined.
Lymphoproliferative Disease Virus in Wild Turkeys in the Southeast U.S.
Justin D. Brown1, Andrew B. Allison1,2, M. Kevin Keel1, and Aly Fadly3

1College of Veterinary Medicine, The University of Georgia,
2Baker Institute for Animal Health, College of Veterinary Medicine, Cornell University
3USDA-ARS, Avian Disease and Oncology Laboratory

Previously, retroviral neoplasms reported in wild upland game birds in the United States of America have typically been associated with reticuloendotheliosis virus (REV) infection. The information presented herein described the first reports of lymphoproliferative disease virus (LPDV) infection in wild turkeys (Meleagris gallopavo) and the first identification of LPDV in North America. Since 2009, LPDV has been identified in eight wild turkeys from four southeastern states; West Virginia (n=5), North Carolina (n=1), Georgia (n=1), and Arkansas (n=1). Systemic lymphoproliferative disease was determined to be the cause of morbidity and/or mortality in five of the eight turkeys. The remaining three turkeys had other primary causes of disease and it is currently not known whether LPDV infection in these birds contributed to the observed disease syndromes or if infection was silent. Gross lesions were variable and nonspecific; however, the observed microscopic lesions were consistent with LPDV infection in domestic turkeys. Proviral sequences of LPDV were detected in samples of spleen, lung, heart, and/or liver from each turkey by PCR using primers developed based on an Israeli strain of LPDV, which amplified a 413nt portion of the gag gene. The maximum likelihood phylogeny of these North American viruses demonstrated that they formed a monophyletic clade with Old World LPDV, distinct from other avian retroviruses, such as REV. Additional studies are currently underway to genetically characterize these wild turkey LPDV strains, determine the in vitro and in vivo host range, and develop rapid diagnostic assays.
The World Organization for Animal Health (OIE) has either updated or drafted new animal disease Code chapters for 2011. At its May 2011 General Session, the World Assembly of Delegates adopted new text to several existing chapters. In addition, in September of 2011 the OIE’s Terrestrial Animal Health Standards (Code) Commission met to propose further modifications to several chapters for consideration at the May 2012 General Session. Of interest to the poultry industry, the following chapters were updated in 2011 or are being proposed for further modification in 2012:

**Newcastle disease (ND).** The OIE adopted the U.S.-recommended changes to the time/temperature parameters for inactivating the ND virus in poultry meat. This will facilitate trade in poultry meat and related products.

**Biosecurity Procedures in Poultry Production.** A new chapter addressing basic biosecurity and hygiene procedures during poultry production was presented for adoption. The draft chapter was distributed for comment in September of 2009 and again in October of 2010. The United States submitted comments many of which were incorporated into the chapter. This new chapter was adopted by the Members in May 2011.

**Prevention, Detection and Control of Salmonella in Poultry.** Some minor changes were proposed to this Code Chapter which the United States supported. In addition, some minor suggestions were made by the United States to clarify certain points in the chapter. The recommendations of this chapter are in line with the practices followed by the U.S. poultry industry.

**Zoning and Compartmentalization.** The existing Code chapter on Zoning and Compartmentalization only received minor changes which the United States supported. The OIE also drafted an accompanying guideline on the application of zoning and compartmentalization to assist Members in implementing the concept.

**Animal Welfare.** Although the OIE presented a new draft chapter on Broiler Chicken Production Systems, the chapter was not adopted for various reasons. Some countries of the world felt that the chapter was too prescriptive, while other countries felt that it did not provide sufficient detail. The recommendations of the draft chapter by-in-large are consistent with the practices followed by the U.S. chicken industry and, therefore, the United States was prepared to support its adoption. Since the chapter was not adopted, it will be re-written and re-presented for adoption again in 2012.
REPORT OF THE COMMITTEE ON TRANSMISSIBLE DISEASES OF SWINE

Chair: Harry Snelson, NC
Vice Chair: Lisa Becton, IA

Paul Anderson, MN; Marianne Ash, IN; C. Black, GA; Becky Brewer-Walker, AR; Corrie Brown, GA; Tom Burkgren, IA; Jim Collins, MN; Stephen Crawford, NH; Effingham Embree, Jr., IL; Mark Engle, TN; James Foppoli, HI; Tony Forshey, OH; Nancy Frank, MI; Cyril Gay, MD; Michael Gilsdorf, MD; Thomas Hagerty, MN; Rod Hall, OK; James Mark Hammer, NC; William Hartmann, MN; Greg Hawkins, TX; Michael Herrin, OK; Sam Hines, MI; Sam Holland, SD; Rex Holt, GA; Ken Horton, TX; Elizabeth Lautner, IA; James Leafstedt, SD; Donald Lein, NY; Tsang Long Lin, IN; Bret Marsh, IN; David Marshall, NC; Chuck Massengill, MO; James McKean, IA; David Nolan, KS; Sandra Norman, IN; Gary Osweiler, IA; Kristine Petrini, MN; Tom Ray, NC; Mo Salman, CO; David Schmitt, IA; Rick Sibbel, IA; Dennis Slate, NH; Paul Sundberg, IA; Seth Swafford, MO; Brad Thacker, MD; Paul Ugstad, NC; Patrick Webb, IA; Hector Webster, CA; Margaret Wild, CO; Larry Williams, NE; Ellen Wilson, CA; George Winegar, MI; Nora Wineland, MO; Paul Yeske, MN.

The Committee met on Oct. 2, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 1:00-6:00 p.m. There were 13 members and 36 guests present. Drs. Snelson and Becton brought the Committee to order and went over house-keeping items. There was a call for Resolutions in addition to those that were previously submitted.

Report of the Feral Swine Subcommittee on Brucellosis and Pseudorabies 2011
Dr. Carter Black, Georgia Department of Agriculture

Dr. Black will be retiring at the end of October and this will be his last report for the Subcommittee. Reports were given on feral swine issues. A report on the strategic baiting of feral swine was given by Dr. Kurt VerCauteren outlining the threat feral swine pose to livestock. Due to this threat from feral swine, a method to potentially control feral swine was investigated. Targeted swine were GPS collared and then followed during the study. It was found that not all swine near the bait station used it but those that did use the bait station were impacted. However, bait stations are not found to be a substitute for other known control measures such as fencing during culling efforts.

Lindsey Holmstrom reported on identifying and optimizing prevention and control strategies against the spread of viral pathogens within the U.S. feral swine populations. The end result will be a high-quality dataset that is extensively analyzed and available to the modeling and interactions of feral
REPORT OF THE COMMITTEE

swine over various landscapes and eco-regions and identifying the epidemiologic and ecologic factors associated with disease spread. This will help other agencies to better prepare and respond from the potential introduction of exotic transboundary diseases.

The last speaker, Dr. Joseph Corn, SCWDS, provided an update on the National Feral Swine Mapping System. Over 450 additional have been made to the distribution map through the NFSMS since January 2008. Currently, 37 states are reporting established feral swine populations. Information is available at https://www.feralswinemap.org/.

The Committee made a motion to approve the Sub-committee report, it was approved and seconded. It was approved by voice vote. The complete report can be found following the Report of the Committee on Brucellosis in these proceedings.

Teschens Disease in Haiti
Dr. Keith Flanagan, Inter-American Institute for Cooperation on Agriculture

Dr. Flanagan went over the activities that he has been actively participating in for Haiti. The investigation started when the ministry of agriculture was informed of increased death loss in swine populations in early 2009. Dr. Ming Ding, USDA APHIS and Dr. Dave Pyburn, USDA VS had also visited previously for disease review and investigation. A review of clinical signs and symptoms was given. Samples were submitted to Plum Island for diagnosis and confirmation which turned out to be Teschens serotype 1 (Picornaviridae). The origin of this virus in Haiti remains unknown. It was originally seen at St. Marks region, then spread throughout the country. There is a suspicion that this virus may have originated from UN forces and via spread through contaminated meat products. There is a current concern of the development of Foot and Mouth Disease Virus (FMDV) due to this additional risk. Dr. Flanagan had to report off of OIE’s information that no vaccine was available for the control of this virus. The lack of vaccine for this disease has contributed to the erosion of trust and respect for veterinary community. Another contingent of veterinarians came to Haiti for support of the disease to include additional sampling to better understand what was occurring in the pig populations. Future plans include looking at Teschovirus vaccine (may be a company within the U.S.) as well as looking at potential field trial of PCV-2 vaccines to compare effect of Teschovirus on vaccine vs. non-PCV vaccinated pigs. The Dominican Republic does vaccinate for PCV but not for Teschovirus. Dr. Flanagan then showed a video of pigs infected with Teschovirus. Getting morbidity and mortality data on the pig was hard because some pigs did not die but were butchered before they naturally died. They did not see a difference in effect of Teschovirus on pigs that were or were not vaccinated for Classical Swine Fever (CSF). The hope is that the virulence will subside over time as the overall population status becomes more exposed to the virus. With this exposure the need for vaccine may diminish as well.
Swine Health Programs Update
Dr. Troy Bigelow, USDA-APHIS-VS, National Center for Animal Health Programs

Dr. Bigelow reported on activities and status of swine health programs. The focus of the talk is on what changes are coming down the pipeline for swine health programs. There is a movement away from disease centric programs to more commodity surveillance plans that are more flexible in disease surveillance and detection. Classical Swine Fever (CSF) is an example of a commodity based program. Pseudorabies virus (PRV) will be moving to a stream-based approach as a commodity program. With these changes in surveillance targeting will also be changes in the regulations that are getting dated. Changes are also occurring within sample and testing capabilities: i.e. oral fluids for PRV. High risk sample selection/risk based sampling will occur, and random surveillance of sow/boar and market will continue for PRV. NSU is engaged with VS on the risk based sampling strategy and if this is appropriate for current national status. Feral swine testing for PRV is not part of the surveillance system, but done instead with Wildlife Services for informational reasons. For FY 2011 PRV infection still found in transitional herds and infected herds were targeted for depopulation. Texas received PRV free status as of May 2011, so now all states considered PRV free. Changes in the program for PRV will be within the regulatory chain. A new proposal in the Federal Register early 2012 and will allow for comment and feedback. The concept is to allow for a comprehensive risk based surveillance program. There will also be reporting changes and also see differences in options for managing infected herds. This will combine PRV and Brucellosis into one program and allows for additional flexibility for surveillance of diseases. The concept paper will further outline what the exact program will be. Comments are sought and encouraged when the paper is made available publically.

Dr. Bigelow reviewed activities for CSF surveillance. So far, all tests to date are negative for CSF in samples tested in 2010-2011 through June, 2011. Garbage feeders are targeted as high risk and subject to inspection for compliance with the Swine Health Protection Act.

Trichinae surveillance is currently being reviewed and over 41 farms currently participating in the program. Dr. Dave Pyburn is the primary contact for this program.

SIV activities and surveillance was reviewed. The objectives for surveillance were covered briefly and have not changed since 2010. Response to identification is a state directed response on a case by case basis. Most current data is available at the USDA SIV web page. For 2011, there have been nearly 1500 samples tested within the anonymous system. There are multiple strains being identified in addition to H1N1.

Will the change in PRV regulations within the U.S. satisfy the EU regulations? The changes will meet the OIE definitions for PRV and should meet the needs for EU declaration of U.S. as PRV free.
There is identification of high risk testing stream as a result of working with State Vets and to find the operations that are of issue. This is in conjunction with NSU and analysis of incoming data. Michigan is doing this as well as North Carolina. North Carolina is doing a cooperative plan on high risk counties and targeting areas that they can get reasonable samples. It is all written up in a local plan and focusing on those that are high risk and not getting tested through normal streams.

**SIV surveillance update**

Dr. Jennifer Koeman, National Pork Board

Dr. Koeman provided a report on the animal health and public health partners in response to swine influenza virus (SIV) issues. She thanked Dr. Pyburn for supporting information. This presentation highlights the collaborative efforts between animal health, public health and industry in managing influenza in swine populations and out in human populations. The surveillance objectives were reviewed. The case stream for sampling and reporting was also reviewed. Data from sequenced isolates is available in GenBank. The surveillance producer brochure was reviewed. It can be viewed at www.pork.org. A history of swine-origin influenza virus infection in humans was reviewed from 2005-2007. Between 2005 and 2010 CDC reported 10 human cases of swine-origin influenza. The recent case of H3N2 infection in children in PA and IN was reviewed. [See the Morbidity and Mortality Weekly Report (MMWR) from CDC in September 2011.]

The formal response plans for both animal health and public health was reviewed. Animal health worked within the animal side for control. Public health focused on the human side and looked at working with folks that were ill. The two groups cooperated and collaborated well in their respective areas to deal with the infection. Other allied and industry groups worked together to manage this situation. This case example shows that the groups can work well together. Very importantly is the timely sequencing of isolates identified within the surveillance program in order for potential trackback and analysis of isolates found.

The National Pork Board also has taken additional actions for alert of the need for vaccination for producers to protect animal and human health as seen by the new release for vaccine. A surveillance group will be meeting this fall to discuss continued needs within the surveillance plans and future actions.

A question came up about what is considered a novel virus? Dr. Sue Trock with the CDC made the comment that there is current definition of novel that is something that is not found before.

Virus names arise from where the virus was identified. But there is also a 'naming' from the genetic origin.

**PRRS Regional Elimination Update**

Dr. Lisa Becton, National Pork Board
Dr. Becton reviewed the activities of the National Pork Board for Porcine Reproductive Respiratory Syndrome (PRRS) Regional Elimination efforts. The 2011 Pork Forum delegates made the advisement for the National Pork Board to continue to support the development tools and resources in support of regional elimination. One component of that support is the 2011 PRRS Economic Impact Study just complete. The total estimated cost to the industry for PRRS $664 million with an additional $477 million in costs associated to biosecurity, veterinary and outbreaks of PRRS. Other information related to the costs for PRRS elimination can be found in the industry summary at www.pork.org, research, PRRS, and project #10-158. Other tools in support of the RE projects include some of the research proposals that were funded for 2011. Some of the projects cover mapping of farms and prevalence identification, novel vaccine development, surveillance activities for validation of use of oral fluid samples in positive herds and a statistical sampling algorithm for determination of PRRS status. Current PRRS RE projects are being funded and overseen by the USDA PRRS CAP coordinator, Dr. Bob Rowland (KSU) and Dr. Bob Morrison (UMN). There are currently funded projects in 7 different states. Each project has different end objectives. For specific details and locations of those projects, see www.prrs.org. Other groups including Boehringer-Ingelheim are active in PRRS RE projects. However, public information is not always available. Other states that are involved in PRRS RE projects include Indiana, North Carolina and Wisconsin. Future funding will become an issue when PRRS CAP ends in 2012.

Support for PRRS research is ongoing and will be cooperatively addressed through the various organizations: National Pork Board, USDA PRRS CAP, American Association of Swine Veterinarians, Boehringer-Ingelheim and State Pork Associations. Newly announced research initiatives have been published by USDA Agriculture and Food Research Initiative (AFRI) and will be pursued for the animal health sections.

In summary PRRS RE is a major collaborative effort and will continue onward to benefit the industry.

2012 NAHMS Swine Study
Dr. Eric Bush, USDA-APHIS, National Surveillance Unit

Dr. Bush reviewed the timeline for the upcoming NAHMS Swine study for 2012. This is a national scope project with collaboration and cooperation with multiple organizations and producers. This will be the fifth swine study. The information collected by the National Animal Health Monitoring System (NAHMS) study will be covered under the necessary confidentiality provisions provided by the Farm Bill. Data will only be identifiable by region. The focus for the study will be management, health and productivity. When to finish will also be a newly added component of the study. Some examples of herd health studies and tracking were provided. Certain diseases like dysentery can be tracked throughout the different studies and changes over time can be identified. Herd and production management changes can also
be identified and tracked over time. Another objective of the study is to look at the prevalence of diseases and food-borne pathogens found in weaned market hogs. This can be accomplished through the collection of biological samples that can be matched with production data. However, all reported data is confidential and reported only on a regional basis. Another objective is to describe antibiotic usage patterns by product, reason for use, duration/dose, and by age of animal treated. The fifth objective is to review exposure to selected pathogens as seen in the collection of biological samples, via blood and feces. There are several requests for collaboration from multiple universities for potential samples to be collected for targeted issues.

The current study will reflect 90.8% of pigs and 88.9% of operations with 100+ total inventories. The intent is to go to the top 13 states for swine production. The overall target population is 61 million pigs and 20,000 producers. There will be two total visits for 2012: one by the National Agricultural Statistic Service (NASS) and one by the Veterinary Medical Officer (VMO). The visit by NASS may be accomplished via telephone interview. The farms with inventory of 1-99 will be questioned through telephone interview and mail survey. The implementation of the survey will occur potentially in June of 2012. For more information, see the USDA NAHMS website. Dr. Bush reviewed the timeline for activities for the 2012 survey implementation, analysis and reporting. Please contact Dr. Bush for questions about the upcoming NAHMS study. The timeframe for sampling will be very similar to each other for the time of sampling, starting June 1 and continuing into the summer months.

**Swine ID Program/Secure Pig program**

Dr. Patrick Webb, National Pork Board

Dr. Patrick Webb, the Director of Swine Health Programs at the National Pork Board provided an industry update on the swine identification and secure pork supply plans. Dr. Webb provided an overview industry involvement in the development of the swine ID plan since 2002 to the present. He reiterated the U.S. pork producer’s commitment to the principle that premises identification, animal identification and recordkeeping are the cornerstone for animal health disease surveillance in rapid and accurate pre-harvest traceability for animal health purposes. Dr. Webb reviewed the membership and role of the swine ID task force whose primary goal is to direct implementation of the swine ID program standards. He discussed the goal the swine ID plan and identified key components of the program standards, outlined the successes so far with implementation the swine ID plan. Currently the pork industry has 101% of the estimated swine premises having registered for the standard seven character alphanumeric premises identification number (standard PIN). This percentage was derived from the most current USDA numbers of registered premises using the 2007 National Agricultural Statistics Service (NASS) agricultural statistics for estimated swine premises. Dr. Webb acknowledged that the NASS state is only an
estimate and present a moving target as far as the denominator. Regardless Dr. Webb said that the cooperative effort between the pork industry, State and Federal animal health authorities has resulted in impressive progress in the registering of swine premises. Dr. Webb discussed the role of the standard PIN in the Site Assessment process for the industry's Pork Quality Assurance Plus program. Site assessments are required by all major pork packers. Pork producers must provide a valid standard premises identification number to the advisor doing the assessment so that the data entered into the databases can be linked to a premises. Dr. Webb overviewed the educational efforts being focused on adoption of the Official Premises ID Number Tag (PIN Tag) for cull sows and boars. He also discussed the industry's interest in working with key swine producing states on PIN Tag pilot project to help determine if the official tags can be used for more targeted Pseudorabies and swine brucellosis surveillance. Dr. Webb discussed USDA's posed rule for animal disease traceability and identified some concerns to the industry. He was concerned that the option for states to use different location identification numbers other than the standard seven character alphanumeric premises identification number can cause some problems if they no longer allowed producers to acquire standard PINs. He was also concerned if states were to remove swine premises information from the national repository then the industry could not validate PIN for the site assessment process. Dr. Webb briefly discussed the secure pork supply plan. USDA has funded Iowa State's Center for Food Security and Public Health to begin the process of developing a secure pig supply plan. The planning process will be similar to the other secure food supply plans that USDA has funded in the past. The Center has put together an advisory group and the first meeting will be October 11-12 in Des Moines, Iowa. The advisory group will be responsible for shepherding the process to develop the draft plan which upon completion will be circulated to a broader audience for input.

Proposed National List of Reportable Animal Diseases (NLRAD)
Dr. Stan Bruntz, USDA-APHIS, National Surveillance Unit

Dr. Bruntz reviewed the NAHRS organizational structure and how each commodity group is represented. The different reasons for the need for the NLRAD include having a standardized reportable list, it provides guidance to state animal health officials and assists in meeting OIE needs for trade. It will also assist in reporting diseases in a standardized manner. One key point is the development of the reporting criteria for diseases and the development of case definitions. See the white paper for the actual language.

There was a 2010 USAHA resolution supporting the development and finalization of the NLRAD. This list is not intended to be in the Code of Federal Regulations (CFR), but instead have the list as a part of guidance or policy statement that can be more flexible than a CFR can be. Dr. Bruntz
reviewed the VS response to the 2010 resolution in support of the continued work on the NLRAD. Comments have been received and more are requested. The White paper will be distributed to the Committee for comments and comments should return to Stan by Oct. 30, 2011, for final assimilation into the final version that will ultimately go to USDA VS Management Team for final approval. For 2012, there will be case definition development in NAHRS for inclusion in the final version of the NLRAD. The goal is to have final approval by 2012.

What does the regulatory process of implementation entail? There will be a reference to a National List in the CFR but the list itself will not be included. The list will reside in a separate document for reference as a standard operating procedure. There will also need to be review on the notifiable diseases and response. Monitored diseases will need to have some response, but will be less stringent than notifiable diseases.

**NAHLN Strategic Plan**

Dr. Beth Lautner, USDA-APHIS-VS

Dr. Lautner provided hard copy materials for her presentation. She discussed the organizational structure and history of the National Animal Health Laboratory Network (NAHLN) Core and other laboratories and the duties that each group carried and some of the disparities that exist. There was a coordinating council that helped to develop the six different operating scenarios. An additional group helped to refine those options. A survey was sent out to each state and other industry groups for what model would be best suited for the future of NAHLN. The support was for a few different models. That led to the development of a "Current Thinking" paper and to use this to get broad stakeholder input via the Federal Register. There will also be an annual review for those labs that have an enhanced role in the NAHLN system. There will be a minimal amount of BSL-3 spaces needed for the enhanced laboratories (similar to the old core lab). This is to accommodate the surge capacity for future needs for increased disease surveillance in a response/recovery mode. There could be some conditions where a private laboratory could be considered as a "specialty laboratory" but not be within the normal NAHLN system. The intent is to seek and receive comments on this new proposal. See the paper for the differences between Level 2 and 3 labs. Level 2 are AAVLD accredited labs while Level 3 are not, but could be assessed by USDA staff for eligibility.

Dr. Snelson discussed the joint special committee results and they did propose a budget plan for each level of laboratory participation. The support for the program would be ideally $30 million dollars. However, there will be adjustments due to budget concerns. There will be an upcoming resolution that will better outline the budgeting requests.

This is a draft estimate ONLY for the different levels of the labs and funds available:

- Level 1 – 12 labs; $500,000/lab
- Level 2 – 30 labs; $350,000/lab
Committee Business

Dr. Snelson reviewed the 2010 Resolutions and the outcomes for those Resolutions.

The first resolution was on Comprehensive Integrated Swine Surveillance (CISS). Please see the 2010 Resolution for the actual response.

The Committee made a motion to change the 2010 to reflect the 2011 resolution to continue to remind National Surveillance Unit (NSU) to continue to update and make progress for the Committee. The motion was seconded. The motion passed by voice vote.

A 2010 joint resolution from the NLRAD was presented and reviewed. See the 2010 for the USDA VS response. A new resolution for 2011 was presented for consideration (See the 2011 resolution language). The Committee made a motion to approve and was seconded. The motion passed by voice vote.

The third 2010 resolution for review was for the NAHMS survey. See the 2010 resolution for the formal response from USDA NSU.

A new resolution to come before the Committee involves the NAHLN funding. The resolution is the latest version to be considered. (See the resolution for language)

The Committee made a motion to move this NAHLN funding resolution forward. A second was made. The motion passed by voice vote.

There was no other Committee business.
REPORT OF THE COMMITTEE ON TUBERCULOSIS

Chair: William Hartmann, MN
Vice Chair: Dustin Oedekoven, SD

John Adams, VA; Bruce Akey, NY; Wilbur Amand, PA; Robert Angus, ID; Joan Arnoldi, WI; James Averill, MI; Joe Baker, NM; Lowell Barnes, IN; Bill Barton, ID; Derek Belton, NZL; Warren Bluntzer, TX; Steven Bolin, MI; Richard Breitmeyer, CA; Becky Brewer-Walker, AR; Charlie Broaddus, VA; Charles Brown, II, WI; Matt Byrne, CA; Mike Chaddock, DC; John Clifford, DC; Michael Coe, UT; Jim Collins, GA; Kathleen Connell, WA; Thomas Conner, OH; Walter Cook, WY; Daniel Crowell, NV; Donald Davis, TX; Thomas DeLiberto, CO; Scott Dewald, OK; Jere Dick, MD; Leah Dorman, OH; Brandon Doss, AR; Phil Durst, MI; Michael Dutcher, WI; Reta Dyess, TX; Anita Edmondson, CA; Leonard Eldridge, WA; Dee Ellis, TX; Steven England, NM; Donald Evans, KS; John Fischer, GA; Dave Fly, NM; James Foppoli, HI; W. Kent Fowler, CA; Nancy Frank, MI; Clifford Frank, MO; Tam Garland, TX; Robert Gerlach, AK; Michael Gilsdorf, MD; Velmar Green, MI; Thomas Hagerty, MN; Rod Hall, OK; Steven Halstead, MI; Beth Harris, IA; Burke Healey, CO; Carl Heckendorf, CO; Bob Hillman, ID; Donald Hoening, ME; Sam Holland, SD; Dennis Hughes, NE; John Huntley, WA; Pamela Luisa Ibarra, MEX; Billy Johnson, AR; Jon Johnson, TX; Shylo Johnson, CO; John Kaneene, MI; Susan Keller, ND; Paul Kohrs, WA; Steve Laughlin, OH; Carolyn Laughlin, OH; John Lawrence, ME; Maxwell Lea, Jr., LA; Rick Linscott, ME; Sharon Lombardi, NM; Konstantin Lyashchenko, NY; Daniel Manzanares, NM; Bret Marsh, IN; Chuck Massengill, MO; Paul McGraw, WI; Robert Meyer, WY; Susan Mikota, TN; Michele Miller, FL; Ernie Morales, TX; Henry Moreau, LA; Jeffrey Nelson, IA; Cheryl Nelson, KY; Kenneth Olson, IL; Mitchell Palmer, IA; Elizabeth Parker, DC; Janet Payeur, IA; Kristine Petrini, MN; Dale Preston, TX; Alex Raeber, CHE; John Ragsdale, NM; Jeanne Rankin, MT; Suelee Robbe-Austerman, IA; Nancy Robinson, MO; Keith Roehr, CO; Mo Salman, CO; Bill Sauble, NM; Shawn Schafer, ND; Irene Schiller, CHE; David Schmitt, IA; Stephen Schmitt, MI; Dennis Schmitt, MO; Andy Schwartz, TX; Charly Seale, TX; Laurie Seale, WI; Daryl Simon, MN; R. Flint Taylor, NM; George Teagarden, KS; Tyler Thacker, IA; David Thain, NV; Charles Thoen, IA; Lee Ann Thomas, MD; Kenneth Throlson, ND; Paul Ugstad, NC; Michael VanderKlok, MI; Arnoldo Vaquer, VA; Jesse Vollmer, ND; Ray Waters, IA; Scott Wells, MN; Jay Whetten, NM; Diana Whipple, IA; Richard Willer, HI; Brad Williams, TX; Ross Wilson, TX; Kyle Wilson, TN; George Winegar, MI; Josh Winegarner, TX; David Winters, TX; Jill Bryar Wood, TX; Ching-Ching Wu, IN; Stephanie Yendell, MN; Glen Zebarth, MN.
The Committee met on Oct. 4, 2011, at the Adam’s Mark Hotel in Buffalo, New York, from 1:00-5:30 p.m. There were 90 members and 64 guests present.

Dr. William Hartmann, State Veterinarian and Executive Director of the Minnesota Board of Animal Health, welcomed members and guests to the Committee on Tuberculosis. Dr. Hartmann introduced the Vice-Chair, Dr. Dustin Oedekoven, South Dakota State Veterinarian. Dr. Hartmann then introduced Dr. David. Fly, State Veterinarian from New Mexico. Dr. Fly announced that New Mexico’s TB status was upgraded and published in the Federal Register this morning; New Mexico is now TB-free. Additionally, Dr. Hartmann announced the upgrade in status for Minnesota, also to TB free.

Dr. Hartmann explained that due to time constraints, state reports would be in written format only. The state reports are included in this Committee report. The program was turned over to Dr. Oedekoven.

Dr. Oedekoven introduced Dr. Dan Grooms. Dr. Grooms presented on his Time Specific Paper, “Validity of the Bovine TB Gamma Interferon Assay on Blood Collected After Exsanguinations.” Dr. Grooms is with the Department of Large Animal Clinical Sciences, College of Veterinary Medicine, Michigan State University. The paper’s abstract is included in its entirety at the end of this report.

The Time Specific Paper was followed by a report of Scientific Advisory Subcommittee by Dr. Mitchell Palmer, the Chair of that Subcommittee. The Subcommittee met on October 3, 2011. The Subcommittee submitted its report to the TB Committee for acceptance.

A motion was made to accept report of the Scientific Advisory Subcommittee. There was a second. The motion was passed. The report of the Scientific Advisory Subcommittee is included at the end of this report.

The Scientific Advisory Subcommittee report was followed by the report of the Bi-national TB Committee, presented by Dr. Chuck Massengill, Co-chair. The report of the Subcommittee is included at the end of this report.

The Bi-national TB Committee report was followed by the Report of the Elephant TB Subcommittee, also given by Dr. Chuck Massengill, a member of that committee. The Elephant TB Subcommittee report is included at the end of this report.

Dr. Massengill’s report was followed by Dr. Alecia Naugle, National Tuberculosis Program Manager, USDA-APHIS-VS. Dr. Naugle presented an Update on the National Tuberculosis Program. The report, The Annual
Update for the State and Federal Cooperative, Bovine Tuberculosis (TB) Eradication Program, is included in this report.

Dr. Naugle’s report was followed by Dr. José Alfredo Gutiérrez Reyes, Director, Animal Health Programs, SAGARPA/SENASICA who gave the Mexico National Tuberculosis Report.

Dr. John R. Clifford, Deputy Administrator and Chief Veterinary Officer for APHIS’ Veterinary Services made comments after the break. Dr. Clifford discussed indemnity for TB infected herds.

The following six presentations were part of a follow up to the USAHA meeting held in Denver, Colorado in 2009, “The Future of the National Tuberculosis Program.”

Dr. LeeAnn Thomas, Director of Ruminant Health Programs for USDA-APHIS-VS addressed Modernizing Regulations. Dr. Thomas’ presentation is included in this report as The Annual Update for the State and Federal Cooperative, Bovine Tuberculosis (TB) Eradication Program.

Dr. Elizabeth Parker, National Cattlemen’s Beef Association, presented on Importation of Infected Cattle.

Dr. Kurt VerCauteren, Supervisory Research Wildlife Biologist from the National Wildlife Research Center presented on Wildlife Associated Disease Transmission. Dr. VerCauteren’s report, Wildlife Associated Disease Transmission: Follow up to “The Future of the National Tuberculosis Program” USAHA meeting in 2009, is included in this report.

Dr. Mitch Palmer, Infectious Diseases of Livestock Research Unit of the National Animal Disease Center presented on Diagnostic Testing Limitations and Needs. Dr. Palmer’s report is included at the end of this report.

Based on Dr. Palmer’s presentation, Dr. Hartmann appointed a Subcommittee to amend the document, Evaluating the Experimental TB Test Performance for Official Test Status. The Subcommittee includes the following persons: Larry Ludeman, Alecia Naugle, Ray Waters, Dustin Oedekoven, and James Averill.

Dr. Aaron Scott, Director, National Surveillance Unit, USDA-APHIS-VS reported on Surveillance, Traceability and Investigative Deficiencies. Dr. Scott’s report is included in this report.

Dr. Robert Ehlenfeldt, State Veterinarian from Wisconsin and Dr. Susan Keller, State Veterinarian, North Dakota, reported on the Disease Control Approach. Their report is included in this report.
At the conclusion of formal presentations, Dr. Hartmann determined there was a quorum.

Three resolutions were approved and forwarded to the Committee on Nominations and Resolutions. Topics included quarantine release procedures for TB infected herds, the Cervid TB Stat-Pak and a multi-state initiative for mycobacterial diseases of animals.

Dr. Massengill reported on a response received from USDA-APHIS-Animal Care regarding 2010 Resolution 36, “Elephant Tuberculosis Guidelines”. The response is as follows:

“USDA-APHIS-AC intends to utilize the 2010 guidelines after following a transparent process that includes notification of stakeholders and development of an implementation plan.”

The Committee adjourned at 5:30 p.m.
2011 USAHA Committee on Tuberculosis State Reports

Arizona
Arizona was declared free of bovine tuberculosis since 1978. Free status was temporarily suspended due to an incident in 1979, but was reinstated in 1981 after prompt elimination of the disease.

In early June 2011, the Arizona Department of Agriculture announced a single steer in a Pinal County rodeo stock operation had tested positive for bovine tuberculosis. The affected steer had been recently imported into the state from Mexico, and had tested negative for TB at the time of importation. The positive diagnosis was determined when the steer was retested to meet another state’s entry requirements.

The event steer operation of 332 was depopulated, and no animal tested positive on post-mortem examination.

California
California Gained Bovine TB Free Status in 1999

- April 2003 - lost “Free Status” when bovine TB was confirmed in three dairy herds in the central valley
- Depopulated affected herds, traced and tested associated cattle
- April 2005 – California regained “Free Status”
- December 2007 - bovine TB detected again in a dairy cow through routine slaughter surveillance
- May 2008 - two associated herds confirmed, for a total of three affected dairies in Fresno Co.
- September 2008 – California downgraded to Modified Accredited Advanced (MAA)
- January 2009 - fourth affected herd identified in San Bernardino Co.
- Two herds were depopulated (5,000 & 1,000 cattle), two herds were released per “test & removal” plan
- Traces ~21,000 cattle in ~659 investigations, and tested ~419,000 cattle in ~254 herds (310 separate herd tests)
- Detected a total of eight infected cows with three different M. bovis genotypes.

2011 TB Investigations

- March 2011 - M. bovis cultured from a granuloma collect during slaughter surveillance
- Genotype is unique to U.S. cattle but matches three Mexican isolates in NVSL database
- No human genetic matches found in CDC database
- Granuloma traced back to cow slaughtered 1-29-2011, sold at auction Dec 2010, from dairy herd in Southern California
- Test >5,000 adult cattle in trace herd, 82 CFT responders, necropsy 4 gamma reactors; 3/4 had lesions compatible with TB and 3/3 cultured M. bovis
• Depopulate, clean and disinfect holding facility used for feeding cow for a month
• Detected two additional culture positive cows when removed remaining CFT+/Gamma negative animals
• Affected herd quarantined and TB model generated a “Test and Removal Plan” for three geographically separated groups: main herd requires three additional 60 day tests (last two must be negative), a six month test, then a test every 12 months for five years; young stock (no infection detected) require two negative 60 day tests, a six month test, then a test every 12 months with adult herd; purchased young stock (no infection detected) require a 60 day CFT and parallel gamma test, and a six month retest.
• Results of the first 60 day retest: tested >6,500 cattle, 146 CFT responders removed, six were gamma reactors, two cultured M. bovis
• All seven cultures match genotype of index cow.
• Traced movements out of herd back five years (>9,000 cattle)
  o In California to five auctions (~5,000 slaughter cattle), 3 slaughter buyers, 26 CA dairies (1,200 cattle), two calf feeders (2,196 cattle), six dealers (403 cattle), 38 “backyard” traces (280 cattle)
  o Out of specification (OOS): 1 dairy, 1 auction, 1 slaughter plant, 1 other
• Traced movements into herd back 5 years (~1,700 cattle)
  o 8 dairies (1,300 cattle), 2 heifer raiser, 24 others (untraceable, dealer, backyard)
• Tested 12 trace herds: 14,022 cattle tested, 1.40% CFT response rate
• Feral cats trapped and tested on affected premises – all negative
• To date ~367 cattle slaughtered/necropsied with culture - no spread of infection to other herds

Sept. 2011: M bovis culture positive granuloma from slaughter surveillance
• Cow slaughtered July 2011, testing herd of origin
• Genotype unique – not match any prior U.S. herds, match a Mexican isolate in NVSL database
• >2,700 cattle tested in trace herd, 142 CFT responders, 37 gamma reactors to be removed

Indiana
• Indiana has investigated four head of cattle with lesions of bovine tuberculosis since November 2008. The origin of each of the animals has been extensively researched, and herd tests were conducted on all herds associated with the traces. The four head of cattle were determined to be of beef breeds and none of the animals
were genetically related. Although the investigation is focused in the southeastern portion of the state, the traces have not been linked epidemiologically. The spoligotyping determined that the bovine tuberculosis in these cases was all of the “cervid” type.

- The first case was a beef cow found to have lesions consistent with bovine tuberculosis at a slaughter plant in Pennsylvania in November 2008. A backtag was collected from the cow at slaughter. A test of the Indiana herd of origin and all adjacent herds determined the herds to be negative. A cervid herd of mixed species existed less than one mile from the trace herd, and it was found to be bovine tuberculosis positive when several red deer were sold to slaughter in the spring of 2009. The red deer were slaughtered at an Indiana state-inspected meat plant where appropriate tissue samples were collected to determine the bovine tuberculosis diagnosis. The cervid herd was depopulated in July 2009. All cattle herds within three miles of this affected site were tested and found negative for bovine tuberculosis. Additionally, wild white-tailed deer in the area around the affected site were harvested in August 2009, and all of the deer were found to be negative for bovine tuberculosis. Two sites that had recently purchased red deer from the affected site were also depopulated. The only positive animals found on these two additional sites were those purchased from the affected cervid herd. Wild white-tailed deer surveillance was established around all three sites during the hunting season.

- The second and third cases were associated with fed cattle found to be positive for bovine tuberculosis after tissues were collected at a slaughter plant in Pennsylvania. Neither of the two animals had identification collected at slaughter. These positive animals were shipped from an Ohio livestock market, and Ohio state and federal animal health officials advised Indiana in July 2010 that seven Indiana farms could have contributed to the loads. All seven of these farms were investigated, and the sites with cows were tested and found to be negative. The sites that were feedlots were restricted to sales to slaughter only, and the origin of their feeder cattle was determined. Herds that contributed feeder cattle to these sites or to feedlots in Ohio were tested. All tested herds were found to be negative for bovine tuberculosis.

- The fourth case was a beef cow slaughtered at a packing plant in Michigan. No identification was collected from the cow. The consignors that made up the load of cows slaughtered at the plant were evaluated and six Indiana farms were tested. One of the tested herds was determined to be positive for bovine tuberculosis and the herd was depopulated in April 2011. All adjacent herds were tested and found to be negative for bovine tuberculosis. Twenty-six Indiana farms were quarantined and tested after exposed animals were removed from the herds. These exposed animals had been
purchased from the affected herd, and they were all subjected to an intensive inspection either at the Animal Disease Diagnostic Laboratory (ADDL) at Purdue or at a state-inspected meat facility. All of the exposed animals were determined to be negative for bovine tuberculosis. Additionally, 76 traces were sent to other states as a part of the investigation. Wild white-tailed deer and small mammals were harvested from the affected site, and all of these animals were found to be negative for bovine tuberculosis. The range of the wild white-tailed deer hunter – harvested surveillance will be expanded because of this additional affected herd.

- Indiana has received exceptional cooperation from the cattle industry, the state-inspected meat plants as well as the veterinary community throughout these investigations.

**Michigan Livestock**

Michigan has been involved in the control and eradication of bovine tuberculosis (TB) since the finding of TB in a free-ranging white-tailed deer in 1994. Since that time, the State of Michigan, along with USDA and the cattle industry have been working statewide to identify areas of disease risk and confirming areas where the risk is negligible. In instances where the disease has occurred, strict controls to prevent the movement of the disease through quick and thorough responses are conducted.

- Due to the work of thousands of producers and disease eradication personnel, on Sept. 14, 2011, Michigan was granted TB Free status for the majority of Lower Michigan (the entirety of the Upper Peninsula was granted TB Free status in October 2005). A 7-county area of northwestern Michigan is designated as Modified Accredited Advanced. The 4-county area of northeastern Lower Michigan which contains over 92% of all TB found remains at Modified Accredited Status and continues to be the focus of intensive control and eradication activity.

- The TB program in the Modified Accredited Zone (MAZ) includes radio frequency identification (RFID) of animals, annual surveillance testing, animal movement testing, movement certificates, compliance and enforcement activities at livestock saleyards and through monitoring of herd inventories, and mobile patrols along zonal boundaries. Much of the program is the same in the Modified Accredited Advanced Zone (MAAZ) except that surveillance activities include whole herd testing at an interval that is consistent with the marketing risk that a herd poses: herds selling breeding animals are tested annually, feeder cattle producers are tested every two years, and feedlots are tested every three years.

- During the time period September 2010 – August 2011, the following TB testing was conducted:
During this same time period movement tracking included 34,166 animals to and from farms in the MAZ and MAAZ.

An innovative project focusing on reducing the risk of transmission of TB from wildlife to cattle was started in 2009 and is in the final stages of completion. This project requires herds to manage their herd in a way that reduces the risk that stored feed, feeding and watering sites, and pasture locations will serve as a source of transmission of the disease from deer. Over 800 of the 1,000 herds located in the MAZ and MAAZ areas of Michigan have entered the project. Beginning January 1, 2012 animals sold from herds in these areas that are not wildlife risk mitigated will require post-movement TB testing at owner expense.

Since 1998 there have been 52 instances of a cattle herd being found to be infected with bovine tuberculosis (43 in the MAZ and 9 in the MAAZ). Through whole herd surveillance testing during Fiscal Year 2011, two (2) TB infected herds were identified. Both herds were located within the MAZ and have completed depopulation. No evidence of transmission of TB to any other herds was identified following thorough investigation.

Wildlife

Since 1994, the state of Michigan has recognized a problem with *Mycobacterium bovis* in free-ranging white-tailed deer from a 14-county area in northeastern Lower Michigan. In 2010, surveillance activities for *M. bovis* continued, with an emphasis on the 5-county area of Alcona, Alpena, Montmorency, Oscoda and Presque Isle counties in the northern half of the Lower Peninsula. There was also increased surveillance in a 10-mile radius around positive deer in Cheboygan, Emmet, Iosco and Shiawassee. Twenty-four (24) white-tailed deer cultured positive from 4,946 deer submitted for testing.

Since the index cases were first identified, over 188,977 free-ranging deer have been tested for bovine tuberculosis and 687 infected deer have been found. Increasingly, the spatial epidemiology of the disease is revealing a highly focal, clustered pattern. Approximately 96% of all positive deer identified to date originated from a 5-county area. Moreover, within that area, the vast majority of positive deer were from Deer Management Unit (DMU) 452. Even within DMU 452, the spatial arrangement of cases is highly clustered, in spite of the fact that sampling effort has been relatively uniform geographically.
White-tailed deer are the maintenance host and primary reservoir for TB in the Michigan outbreak. If eradication is to be achieved, control strategies must focus on the disease in deer. Strategies for eradication of TB from Michigan wildlife continue to focus on:

1) reducing deer population densities to biological carrying capacity and 2) reducing artificial congregation of deer by restriction or elimination of baiting and feeding. These strategies have been implemented through provisions of a late firearm antlerless deer season, sufficient antlerless deer licenses to reduce the deer population, and by prohibition of deer baiting and feeding.

Population estimates based on reconstruction techniques similar to the sex–age–kill method described by Creed et al. (1984) suggest that the deer population in the five-county area has declined approximately 39% since 1995 (161,415 to 99,148).

The achievement of this substantial population reduction highlights the critical role that hunters have played in the control of TB in Michigan. Nonetheless, persistent focal areas of high density on private land remain problematic. Baiting and feeding have been prohibited in the seven counties from which 97% of all TB positive deer have originated. The overall scope of feeding has declined dramatically since 1997, with large scale feeding largely a thing of the past. While some illegal baiting and feeding continues to occur, the size of these sites is substantially reduced, and it is hoped that heightened enforcement is expected to reduce the practice further over the next several years.

While much work remains, substantial progress has been made towards eradication of TB from Michigan wildlife. Apparent prevalence in the core area of the outbreak Deer Management Unit (DMU) 452 was 1.8% in 2010. Trend analysis of prevalence data from 1995 to 2010 indicates a statistically significant decreasing trend. However, prevalence and transmission rate have been flat for the last seven years.

The intervention strategies have been successful in bringing down the average prevalence in DMU 452; however, there are clusters of disease that will be more difficult to manage. The Michigan Department of Natural Resources is working with USDA researchers in Ames, Iowa to develop a TB vaccine for use in free-ranging deer. Preliminary results are encouraging and the vaccine appears to give some protection from disease. Vaccinated groups of deer given the vaccine orally or subcutaneously and then challenged with *M. bovis* had statistically significantly fewer visible TB lesions and less severe TB lesions than unvaccinated deer.

In summary, Michigan is showing progress in eradicating bovine TB from its free-ranging deer population. However, this success is...
fragile and we need to be diligent in maintaining our control strategies.

Minnesota

Minnesota received an upgrade in status on October 1, 2010. The majority of the state is TB-free, with a small zone in northwestern Minnesota at Modified Accredited Advanced (MAA). Since the upgrade, movement regulations, testing requirements and official identification requirements remain in place for the MAA zone. All herds in the zone receive a yearly whole herd test and a 60-day test for breeding cattle moving out of the herd. Permits are required for both movements of cattle into and out of these herds, and a movement certificate must accompany the cattle moving out of the zone. Producers also continue to track their inventories.

In early May 2011, the Board of Animal Health requested an upgrade in status to TB-free for the entire state, and a documentation review by a USDA team followed. Publication is pending for the interim rule that will reclassify Minnesota to TB-free.

After the upgrade in status, the Board will continue enforcement of the majority of regulations that are in place for the Management zone, that zone within the MAA zone where the TB positive wild white tail deer have been found. The Minnesota Department of Natural Resources has agreed to continue surveillance testing in the wild white tail deer population for a period of five years after the last TB positive deer. The Board will continue with the movement, testing and official identification requirements for the producers in that zone for the period of time of DNR surveillance.

New Mexico

New Mexico has been free of bTB for five years.

A USDA review team examined the New Mexico Bovine Tuberculosis program in June 2011. Based on the review findings, the team has recommended that the Bovine Tuberculosis MAAZ encompassing Curry and Roosevelt Counties (NMLB inspection district 13) be removed. The State of New Mexico will be classified as Bovine Tuberculosis free. It is anticipated the rule will be published on or around October 1, 2011.

Ohio

Dairy 1

- Herd at peak of 2,200 cattle in January 2009
- Prior to April 2010, all cattle removed from herd went to slaughter
- April 2010 – herd went into receivership
- 401 cattle sold to Wisconsin – some moved on to Minnesota
- 64 cattle sold to OH producer
- 662 cattle tested for movement to IN – 3 suspects on CCT
- Bank wanted to necropsy 3 head and send rest to slaughter - Bank did not want to operate under quarantine
Of the 3 necropsied, 2 were negative, 1 positive
Springers/cows purchased from Kansas (1711 head), IN (439 head), and OK (100 head)
Positive cow’s ID traced to Kansas dairy
KS verified cow came from NM, where she tested negative for TB prior to movement
Calves were not traced out in this investigation
Facility cleaned & disinfected in August 2010
October 2010 – farm sold and began operating under the name Flatland Dairy

Dairy 2
Repopulation began in January – all animals required to have a negative TB test and permit
Herd re-tested in August 2011, approx. 2300 animals
4 suspects necropsied; NGL & neg histopath; quarantine released September 2011

Dairy 3
All 64 head identified and sent to slaughter; no further cases
Whole-herd tested via caudal fold test (CFT) (4800 head)
353 suspects tested with Bovigam
49 positives on first test; 24 positive on second Bovigam
24 reactors moved to slaughter in November 2010
All were histopath and culture negative
Quarantine released January 19, 2011

Producer Group, Eaton, Ohio
7 owners from Ohio
One was a feedlot
2 Ohio owners provided animals to the feedlot
One farm was excluded by carcass weight
Remaining farms were tested
658 head tested neg between 7/29/2010 and 9/23/2010
Potential sources of animals to Ohio and Indiana feedlots needed to be identified
Returned to United Producers, Inc. (UPI) Eaton for additional records
Reviewed records to determine if animals listed on the receipts could reach carcass weight.
Purchase weights too low to reach weight.
Returned to UPI Eaton to obtain records from 2009
70 receipts were of interest
20 receipts eliminated
Based on weight, sex and color
Remaining receipts involved 17 farms
7 resulted in dead ends
Craig’s list, source not determined, etc.
REPORT OF THE COMMITTEE

- 10 herds identified as needing testing
- 1 herd sold out
- 3 herds not genetically related

Trace herd
- December 17, 2010 - Ohio notified of PCR-positive on submission from JBS Packerland, Michigan
  - Cow was one of 36 in load; No ID; Hot weight was 868#
  - MI ruled out 20 cattle based on weights
  - Probable Angus or possibly Chianina cross
  - Load originated from Egbert Livestock in OH
  - Egbert assembled cattle from 2 IN dealers and 2 IN markets
  - IN narrowed investigation to 6 IN herds and 1 OH herd
  - OH herd – 35 head tested negative (one suspect – neg CCT)
  - IN herds
    - 5 herds – 150 head tested negative (5 suspects – neg on Bovigam)
    - Trace herd – 100 cattle tested
      - 6 suspects – 5 positive on Bovigam; went to necropsy
      - On necropsy, 4 of 5 had lesions compatible with TB
      - Feb 25 – IN notified that 3 of 4 cows had positive PCR
  - April 2011 – IN began sending traces to OH/WV
    - Some lacked ID, number of cattle, breed (expected to have Limousine, Limflex, and Angus cattle)
  - 17 OH/WV traces for 37 animals
    - Slaughtered before investigation started – 4 premises/6 animals
    - Sold/transferred to other states – 3 premises/11 animals
    - Indemnity paid – 9 premises/19 animals
    - Unable to find animal – 1 premises/1animal
    - 10 herds tested/257 animals

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Nebraska
Fallow Deer & Elk Herd in Knox County

TB was confirmed in a fallow deer and elk herd in Knox County in March 2009. The entire herd was depopulated the first week of June, 2009, with
60% of the elk, and 60% of the fallow deer showing visible lesions compatible for TB. Final culture results from the USDA APHIS NVSL showed approximately 70% of the elk and the fallow deer, cultured positive for M. bovis, even those with no visible lesions.

**Cattle Herd in Rock County**

In May 2009, an affected cattle herd in north-central Nebraska was detected by means of a slaughter trace of a cull cow. (The spoligotype of this M. bovis organism was different than the cervid herd and labeled a “south west” or Mexican strain) Subsequently, a whole herd test revealed one additional cow to be positive for TB. We had hoped that the index herd of approximately 800 cows would be depopulated, but USDA-VS declined. The finding of this herd resulted in the epidemiological testing of approximately 22,000 head of cattle from 61 different herds in 20 counties (39 were across the fence contacts, and 22 involved trace-in/trace-outs).

Fortunately, no more infected cattle associated with the index herd were found. The index herd was evaluated by a Center for Epidemiology and Animal Health (CEAH) model, which determined that a test and removal protocol would be implemented to release quarantine. After a total of four whole herd tests (including 2 whole herd gamma tests) 60+ days between each test, plus euthanasia and post mortem of over 100 responders, the quarantine was released in March 2010. Another whole herd assurance test was completed in March 2011, with all animals testing negative.

**Cattle from South Dakota**

In January 2009, a 20–month old fat heifer that was slaughtered in Schuyler, Nebraska, was found to be positive for TB. The only ID was a back tag that showed she was from a feedlot in Yankton County, South Dakota. By process of elimination, South Dakota traced her to a herd of origin near Irene, SD. Unfortunately they weren't able to test that herd until December 2009, and we were notified in January 2010 of possible trace backs to Nebraska.

Continued testing in South Dakota revealed four more positive animals, and all five were part of a group of 189 heifers that had entered the South Dakota herd in February 2008. Many of these animals had been sold through the Bassett Livestock Market and originated from 4 Nebraska herds, with a 5th herd having summer grazing fence line contact with the infected herd in SD.

All five herds were quarantined and all tested negative for TB.

Trace outs from the South Dakota infected herd revealed 5 northeast Nebraska herds that had purchased heifers from the South Dakota herd. Those herds were also quarantined and tested. The cows that had been purchased from the infected herd were euthanized and examined for TB lesions. Unfortunately, one of the purchased cows was found to be positive for *M. bovis*. This gave us a second TB positive beef herd in Nebraska. That herd was depopulated and no more infected animals were found. There were 8 fence line contact herds, and all of them have been tested negative.
Testing around the Nebraska herd with the infected South Dakota animal amounted to another 3,000+ head of Nebraska beef cattle that had to be tested.

**Wild Deer Surveillance**

The spoligotype of the *M. bovis* from the South Dakota herd is the same as the spoligotype of the positive cervid (deer and elk) herd. In May 2009, Nebraska Game and Parks collected and sampled 42 wild white-tailed deer within 2 miles of the location of the cervid herd. Head lymph nodes (parotid, retropharyngeal and mandibular) were collected and examined for TB lesions, but no lesions were found.

A much larger sample encompassing Knox and Cedar counties was collected during the hunting season in the Fall of 2010. The head lymph nodes from 487 deer were examined. Nodes from 12 deer with suspicious lesions were submitted to NVSL for histopathology and culture. The histopath results were negative. For the other 475 deer, 95 pooled samples (5 deer / sample) were submitted for culture. All culture results were negative. In addition, lymph nodes from 1,098 deer were collected without examination of the animal. These nodes were examined for lesions and any suspicious nodes were examined histopathologically. All were negative.

We have completed surveillance of possible wildlife-exposed cattle herds within a 2 mile radius of the infected elk herd pasture. Seventeen herds were quarantined and all have been released after testing negative.

**Dairy Herd Testing**

In February and March 2010, Nebraska Department of Agriculture (NDA) conducted TB testing on 3 dairies in Nebraska. This work was done based on information that a dairy herd in Texas had announced their TB positive status. The trace ins/outs from that Texas herd implicated three dairy herds in Nebraska. At this time, NDA has tested 14,857 dairy animals with all test results being negative.

**Synopsis through March 2011:**

- Twenty six (26) counties affected by TB testing and surveillance;
- Over 23,000 beef cattle tested (CFT) as a result of Rock County TB testing;
- Over 4,700 beef cattle tested as a result of the South Dakota traces;
- Over 3,700 beef cattle tested for the Knox/Cedar County TB surveillance;
- Dairy testing added around 14,857 more head;
- To date only two (2) cattle have tested positive in Rock County (the original two identified) and one in Cedar County (South Dakota trace);
- Involved 95 herds: Original herd in Rock County; fence line contacts from original; traces in and out from original; South Dakota traces in and out; dairies; additional fence lines for herd in Dixon County, and positive cervid herd surveillance testing.
TUBERCULOSIS

- This equals approximately 50,000 cattle that were tested for TB by NDA since June 2009. (49,757)
- Over 35,000 hours by BAI field personnel involved in testing between March 2009 and March 2011.

**Update since March 11**

In late June, a cow with TB compatible lesions was discovered at a slaughter plant in Nebraska. Follow-up testing at NVSL revealed and confirmed *M. bovis*, and was subsequently labeled a “south west strain”. The cow was part of a group of cows sent to slaughter by a dealer who purchased cull cows from livestock markets in Nebraska and Colorado. An official calfhood vaccinationOCV tag was recovered from the cow, which was tied to a herd in western Nebraska. The individual who OCV’ed the animal claimed that the cow had been sold sometime in the past, but could not prove that. The herd was quarantined for testing and performed in spite of the owner’s vociferous protests! Testing of 573 head in four pastures was performed in July resulted in 33 responders, which were all gamma interferon negative. The herd will undergo another whole herd test (60+ days after the first test) on September 30. Results will not be known until the first week of October.
This Subcommittee was formed in October 2007 by the Chair of the USAHA Committee on Tuberculosis, Dr. Kathleen Connell, at the request of the American Association of Zoo Veterinarians Working Group. Since 1996, the National Tuberculosis Working Group for Zoo and Wildlife Species had been responsible for developing and revising the “Guidelines for Control of Tuberculosis in Elephants” in 1997, 2000, and 2003.

The USAHA Elephant and Wildlife TB Scientific Advisory Subcommittee (Subcommittee) was formed and met to review and revise the 2003 guidelines in 2008. It was asked again in 2010 to review and revise the 2008 guidelines in light of new scientific publications, public health concerns by the Centers for Disease Control and Prevention CDC at an elephant facility, and data collected from official USDA diagnostic testing. The Subcommittee recommends replacing the 2008 Guidelines with the 2010 version of the "Guidelines for Control of Tuberculosis in Elephants". A summary of changes between the versions include:

- Additional clarification and requirements on the classification of treated and exposed elephants within the TB management group options for culture positive or serologically reactive elephants.

- The 2008 guidelines called for annual testing by the triple culture method (3 trunk wash samples) and a single sample of serum collected for analysis by the ElephantTB Stat-Pak® Assay and, where warranted, by the Chembio Diagnostic Systems Inc., MAPIA™. The ElephantTB Stat-Pak® Assay was approved and licensed by United States Department of Agriculture (USDA), Center for Veterinary Biologics in 2007. The 2010 proposed guidelines allow use of a newly developed serological test – Chembio Diagnostic Systems, Inc., Dual Path Platform (DPP®) VetTB Assay which was evaluated by Greenwald et.al in 2009. The proposed guidelines for treatment and movement restrictions would also include serological results and Mycobacterium tuberculosis complex exposure history.

- Added flowcharts for the TB management groups in the appendices.

- Updated reference information.

The Subcommittee submitted the “2010 Guidelines for Control of Tuberculosis in Elephants” to the TB Committee for acceptance. The report was accepted by the Committee on Tuberculosis with the following resolution. The Resolution passed the Committee last year and USDA accepted it. However, USDA-APHIS-AC has not responded to the communication from USAHA.

2010 RESOLUTION:

The United States Animal Health Association (USAHA) requests that the United States Department of Agriculture, Animal and Plant Health Inspection
TUBERCULOSIS

Service, Animal Care adopt and implement the “Guidelines for the Control of Tuberculosis in Elephants 2010.”
The following is an excerpt from the presentation to the Committee on Tuberculosis in 2005 by Dr. Billy G. Johnson. This is intended to serve as historical reference on the BNC.

The U.S.-Mexico Bi-National Tuberculosis and Brucellosis Eradication Committee was formed in 1993 based on a recommendation by the USAHA with responsibility to provide oversight on the eradication programs in each country and to provide recommendations for the minimum requirements for the exportation of cattle from Mexico to the United States. This followed other cooperative efforts between the two countries that have eradicated animal diseases such as Foot and Mouth Disease, screwworms and Venezuelan Encephalomyelitis. The BNC has sixteen members with representation from the livestock industries, research, and State and federal officials. From 1995 until 2000 the Committee assumed the responsibility for coordinating reviews in Mexico for compliance with the Consensus Document developed by the border states officials. This document was developed pending the publication of USDA regulations covering the importation of cattle from Mexico. The Consensus Document placed responsibility on the states in Mexico to initiate programs that would quickly reduce the prevalence of tuberculosis in that country and therefore reduce the risk of infected cattle entering the United States. USDA-APHIS then published a regulation establishing authority to control the importation of cattle regarding tuberculosis. The BNC worked closely with APHIS officials in developing these requirements and in developing review procedures to be followed in Mexico. By June 1, 2005 federal officials in Mexico were required to certify those states meeting the Modified Accredited requirements.

The Bi-National Committee is similar to the USAHA committees in that it does not establish the eradication procedures in Mexico but makes recommendations. Since APHIS now requires countries exporting cattle to the United States to have eradication procedures equivalent to those in the United States, the recommendations established by the Tuberculosis Committee of USAHA are important not only to the U.S. but also to those countries exporting cattle to the U.S. Although the BNC was originally established for tuberculosis procedures, brucellosis was later added to the Committee responsibilities. Although the brucellosis programs in most states in Mexico are not progressing at the same rate as their tuberculosis eradication programs, the state of Sonora has progressed well and is looking at Brucellosis Free status. Also a U.S.-Mexico Tick Committee meets at the same time as the BNC and provides a summary of their meeting to the BNC since most of the BNC members are also involved with tick eradication programs.
VALIDITY OF BOVINE TB GAMMA INTERFERON ASSAY ON BLOOD COLLECTED DURING EXSANGUINATION AT SLAUGHTER

Chicka C. Okafor 1,3*, Daniel L. Grooms 1, Steven R. Bolin 2, John B. Kaneene 1,3
1Department of Large Animal Clinic Sciences, 2 Diagnostic Center for Population and Animal Health, 3 Center for Comparative Epidemiology, Michigan State University

Bovine tuberculosis (BTB) is of economic, regulatory, and zoonotic importance. It is caused by Mycobacterium bovis. The gamma-interferon(γ-IFN) assay is a blood based test for BTB, which measures cell-mediated immunity to M. bovis. Integrating γ-IFN assay with currently used visual inspection of carcasses in post-mortem slaughter surveillance could help detect more BTB herds. However, it is not known if a γ-IFN response, sufficient to produce a valid test, can be obtained using blood collected at exsanguination. We hypothesized that there is no change in γ-IFN interpretations between blood collected pre-slaughter and at exsanguination. Sixteen cattle were experimentally sensitized with killed M. bovis creating an immune response similar to that found in BTB infection. Four controls received mineral oil only. The γ-IFN assay was performed on blood samples collected pre-slaughter and exsanguination. The probability that M. bovis sensitized cattle would remain γ-IFN positive on blood collected at exsanguination was 0.75 (95% CI 0.54, 0.88). Using paired t-test analysis, there was significant decrease in the mean ELISA optical density (OD) readings from pre-slaughter and at exsanguination (p=0.03). Although ELISA OD readings of individual cattle dropped at exsanguination, a change in the ELISA interpretation only occurred in animal that were borderline positive pre-slaughter. Potential factors responsible for the drop in γ-IFN response are being investigated. Our results suggest that the majority of cattle with a positive γ-IFN response pre-slaughter will remain positive at exsanguination. Therefore, γ-IFN assay may provide a useful tool for BTB surveillance at slaughter.
Development of Proposed TB/Brucellosis Regulations

APHIS formed a joint working group to discuss overarching regulatory concepts for the bovine TB and brucellosis programs since both programs are undergoing similar changes. The joint TB and Brucellosis Regulatory Working Group met weekly from September 2010 through April 2011, and developed a regulatory framework that was published in the Federal Register on May 6, 2011. This framework described a single rule for both the TB and brucellosis programs that ensures consistency and flexibility while reducing administrative burdens.

Public meetings to solicit comments were held in May and June 2011. Transcripts of the meetings are available at www.aphis.usda.gov/animal_health/tb_bruc/meetings.shtml. Based on the comments we received from the Federal Register notice, during the public meetings, and through other outreach efforts, APHIS is developing new regulations and supporting standards for the TB and brucellosis programs. The Code of Federal Regulations will provide the legal authority for the programs while the details of the programs will be described in a program standards document. The proposed rule is targeted for publication in early 2012.

Policy for Management of TB-Affected Herds

APHIS continued to utilize a new approach for the management of TB-affected herds that was implemented in 2009. Briefly, APHIS decides whether to provide Federal funding for whole herd depopulation or to manage the herd under a test-and-remove plan for each TB-affected herd on a case-by-case basis. APHIS uses an epidemiologic model and economic analysis to aid in decision making. During FY 2011, APHIS provided Federal funds to depopulate seven TB-affected herds. A test-and-remove management plan was recommended for one herd that was eventually depopulated with State funds. One large dairy herd is under test-and-remove management.

In January 2011, APHIS hosted a series of three webinars for State Animal Health Officials, Area Veterinarians in Charge, Area Epidemiologist Officers, and designated TB epidemiologists to provide more information about the technical aspects of the epidemiological model and the decision-making process for TB affected herds. APHIS worked closely with members of the National Assembly of State Animal Health Officials during FY 2011 to obtain input concerning a draft policy memorandum that provides guidance
for classifying and managing livestock herds affected with TB under this new approach. APHIS plans to finalize the memorandum in early FY 2012.

**Bovine State Status**

As of September 15, 2011, 46 States, two Territories, and three zones are TB accredited-free (AF), including Puerto Rico and the U.S. Virgin Islands. California is modified accredited advanced (MAA) and three States have split-State status. New Mexico and Minnesota have AF and MAA status. Michigan continues to have AF, MAA, and modified accredited (MA) status. However, 57 counties of the lower peninsula were advanced from MAA to AF status on September 14, 2011. In FY 2011, APHIS determined that the MAA zones in both Minnesota and New Mexico meet the requirements for AF status. Publication is pending for interim rules that will advance the MAA zones and reclassify the entire States of both Minnesota and New Mexico as AF.

**Captive Cervid State Status**

All States and territories have MA status.

**TB Program Reviews**

APHIS conducted TB program reviews in the States of Michigan, Minnesota, New Mexico, and Indiana in FY 2011. Reviews in Michigan, Minnesota and New Mexico were conducted to evaluate compliance with the memorandums of understanding that are required for split-State status and to evaluate requests for status advancements. An on-site review was conducted in Michigan during May 2011. Documentation reviews of Minnesota and New Mexico were conducted in May through July. An on-site review was conducted in Indiana during September 2011 to evaluate response and management activities conducted after the detection of three TB-affected cervid herds and one TB-affected beef herd since FY 2009.

**TB-Affected Herds Identified in FY 2011**

Nine TB-affected herds were detected during FY 2011 as of September 15, in seven beef and two dairy herds. These herds are located in Arizona (one roping steer herd, categorized as a beef herd), California (one dairy), Colorado (one dairy, three beef), Indiana (one beef), and Michigan (two beef). Six (67 percent) of the TB-affected herds identified this year (two dairy and four beef herds) were detected as a result of slaughter surveillance and subsequent epidemiologic investigations.

Seven cattle herds were depopulated with Federal indemnity. The California dairy herd is under test-and-remove management. State indemnity funds were used to depopulate one Michigan beef herd.
National TB Surveillance

**Granuloma Submissions:** From October 1, 2010, through June 30, 2011, 9,734 granulomas were identified during postmortem slaughter inspection and submitted for diagnostic testing. These lesions originated from 166 U.S. establishments that slaughtered 24.8 million cattle, including 5.3 million adult cattle. The minimum standard for slaughter surveillance is 5 granulomas submitted per 10,000 adult cattle slaughtered annually. This standard is applied to each slaughter establishment. Of the 40 highest volume adult cattle slaughter establishments through June 30, 36 (90.0 percent) met or exceeded the submission standard, and 5 (10.0 percent) establishments did not. These 40 highest volume establishments slaughter approximately 95 percent of all adult cattle slaughtered in the United States.

Of the 9,734 granulomas submitted by slaughter establishments through June 30, 2011, 27 (0.28 percent) had histology consistent with mycobacteriosis. Of these 27 cases, TB was confirmed in 20 (74.0 percent) cattle. TB is confirmed by a combination of polymerase chain reaction testing of formalin-fixed tissue and culture of fresh tissue.

**Slaughter Cases:** Of the 20 TB cases detected in cattle at slaughter through June 30 2011, four cases occurred in adult cattle over 2 years of age, and 16 cases occurred in feeder cattle. The four adult cattle cases include an adult beef cow that led to detection of an affected Indiana beef herd, an adult Holstein cow that led to detection of an affected California dairy, an adult beef cow that led to the detection of an affected beef herd in Canada, and an adult beef cow from Nebraska. The fed cattle cases were all beef-type cattle and were from slaughter establishments in Texas (11 cases) and Colorado (five cases). Seven cases were in Mexican-origin cattle and the remaining nine cases are under investigation.

**Mexican-Origin Slaughter Cases:** A total of seven TB-infected animals were determined to be of Mexican origin through slaughter surveillance. The official Mexican ear tags collected at slaughter indicated origin from the States of Chihuahua (four cases), Nuevo Leon (one case), Tamaulipas (one case), and Veracruz (one case). Two cases are believed to have originated from Mexico based on the epidemiological investigations, but the definitive Mexican State-of-origin could not be determined.

Two clusters of TB cases including cattle of Mexican origin were detected in feedlots. One cluster involved four cases from a Texas feedlot where one animal had official Mexican identification indicating origin from Chihuahua. The second cluster involved four cases from a Colorado feedlot where two had eartags indicating Chihuahua origin. The other animals in these two clusters did not have official identification present at the time of slaughter and are being investigated. A fifth Chihuahua-origin case was detected in a roping steer in Arizona as a result of TB testing for interstate movement.

The number of Mexican origin cases increased this year, after substantial declines in FY 2009 and 2010. The number of cases with official Mexican identification during FY 2006 through 2011 are 26, 17, 11, 3, 1, and
8, respectively. Cattle imports ranged from 1.1 to 1.4 million during 2004 through 2007, then declined during the 2008 and 2009 import cycles, to just over 800,000 imports. In FY 2010 and 2011, import numbers increased to 1.1 and 1.4 million live cattle from Mexico, respectively.

**Live Animal Testing:** Tuberculin skin testing in live animals is another component of national TB surveillance. As of June 30, 2011, 792,634 caudal fold tuberculin tests of cattle and bison were reported, with 9,762 responders (1.2 percent, 49 States and Puerto Rico/U.S. Virgin Islands reporting). The response fraction by State, for 44 States testing more than 300 animals, ranged from 0.0 to 4.2 percent (median, 0.82 percent). During FY 2008 through 2011, 13, 24, 23, and 18 States, respectively, had a response fraction of 1 percent or greater. The number of States having a response fraction of less than or equal to 0.25 percent was 13, 12, 5, and 6 from FY 2008 through FY 2011, respectively.

Tuberculin testing is the primary means of surveillance for TB in captive cervids as there are no standards for granuloma submissions for establishments that slaughter cervids. As of June 30, 2011, 20,080 single cervical tuberculin skin tests were conducted in captive cervid species with 323 suspects (1.6 percent) reported to APHIS. The number of captive cervids tested annually has ranged from 25,000 in FY 2006 to just over 10,000 in FY 2007.

The gamma interferon test has been available as an official supplemental test in the TB program since 2005. Laboratories in four States (California, Michigan, Nevada, and Texas) and the NVSL are approved to conduct gamma interferon testing. A total of 7,974 tests were conducted in cattle in through August 31, 2011.

**Collaborations with Mexico**
APHIS continues to work with Mexico to ensure equivalency between the two countries’ requirements for controlling TB. To accomplish this, APHIS conducted reviews in Chiapas and Veracruz during FY 2011. As a result of these reviews, the MA zone in Veracruz maintained its MA status. The final review report for Chiapas is pending. APHIS appreciates the contributions of the individuals that served on these Mexican review teams.

Notably, the MA zone of Chihuahua was downgraded to AP status effective August 25, 2011. Mexico’s efforts to address the recommendations from a 2010 review of Chihuahua were insufficient to reduce the risk of TB in imported Mexican cattle. Five cattle imported from Chihuahua were found with TB during FY 2011, exceeding the allowable standard.

**TB Serum Bank**
APHIS’ is continuing to obtain well-characterized serum samples with skin test results for samples from uninfected animals, including skin test, histopathology, and TB culture results for samples from infected animals. The serum bank contains 2792 serum samples from cattle, of which 444 are
positive, and 3584 samples from cervids, of which 92 are positive. Serum bank samples continue to be available to researchers and diagnostic companies for serologic test development.

In FY 2012, the serum bank will continue to accept blood and tissue samples from potentially infected cattle and white-tailed deer and blood samples from all States, and from presumably uninfected cattle and white-tailed deer from AF States.

**Cervid Serology Project**

The Center for Veterinary Biologics licensed the CervidTB Stat-Pak® (Stat-Pak) in late 2009, for use in elk and red deer. The cervid serology project was conducted during FY 2011, to evaluate the Stat-Pak as a primary test for official TB program use in captive and free ranging *Cervus canadensis* (North American elk), *Odocoileus virginianus* (white-tailed deer) and reindeer (*Rangifer tarandus*). Samples from 1,574 presumably uninfected animals were tested by the Stat-Pak. A total of 14/842 elk (1.6 percent), 17/547 white-tailed deer (3.1 percent) and 15/185 reindeer (8.1 percent), were non-negative on the Stat-Pak, resulting in specificity estimates of 98.3 percent in elk, 96.9 percent in white-tailed deer and 91.9 percent in reindeer. In contrast, the estimated specificity of the single cervical tuberculin skin test in presumably uninfected animals during routine TB program testing is 98.54 percent for elk, 97.40 percent for white-tailed deer, and 82.72 percent for reindeer. A report on this project was provided to the TB Scientific Advisory Subcommittee for review.
Selected State Updates on Tuberculosis

**Colorado Update:** In FY 2010, a TB-affected dairy was identified in Colorado. The resulting epidemiological investigation found an additional five TB-affected herds in Colorado in FY 2010 and FY 2011, including three beef herds and two dairy herds. In these herds, TB was only detected in purchased cattle originating from the index herd. All herds were depopulated with Federal indemnity.

**Indiana Update:** TB was confirmed in a seedstock beef herd as a result of routine slaughter surveillance detection of *Mycobacterium bovis* in a culled beef cow. The investigation of this herd of approximately 220 cattle resulted in trace investigations of over 150 cattle in 11 States. To date, no additional infected animals or herds have been found outside the index herd. Initial wildlife surveillance of white-tailed deer on and adjacent to the infected farm has not detected infected animals. The beef herd was depopulated with Federal indemnity.

Indiana continues to investigate two domestic beef feeder cattle cases identified through routine slaughter inspection in June 2010. Genotyping analysis indicates the isolates from these cases match isolates from TB-affected captive cervid herds detected in Indiana and Nebraska and beef cattle cases in Kentucky, Nebraska, and South Dakota in FY 2009 through 2010, in addition to the FY 2011 affected beef herd in Indiana.

**Michigan Update:** Two TB-affected beef herds were detected through surveillance testing in FY 2011. One Michigan dairy is continuing under a test-and-remove herd plan from 2004; the herd was scheduled for quarantine release but an infected animal was detected during the final test for quarantine release. One Michigan beef herd detected in FY 2010 remains under a test-and-remove herd plan in the MA zone. A second beef herd detected in FY 2010 was released from quarantine in FY 2011. Two captive cervid herds detected in FY 2009 remain under quarantine in the MA (bovine) zone of Michigan.

**Nebraska Update:** An epidemiological investigation of a routine slaughter surveillance detection of *M. bovis* in a beef cow is underway in Nebraska. The initial whole-herd test did not identify any other infected cattle. A second whole-herd test is planned and other possible source herds are being investigated.
Bovine tuberculosis (bTB) is a serious disease in cattle in terms of its global economic impact. Often times, free-ranging wildlife has been linked as the bTB reservoir for infection. At the 2009 meeting, participants identified 5 recommendations for the National TB Program relative to Wildlife Associated Disease Transmission:

- State and federal animal health authorities should drive efforts to mitigate risks to and from wildlife. These efforts should include development of science-based methodologies for reducing transmission risk associated with livestock feeding and watering, stored feeds, and environmental exposure.
- State and federal animal health authorities should conduct wildlife surveillance in areas where bTB has been identified in livestock.
- State and federal animal health authorities should consider means by which state status can be and should be disengaged from wildlife disease prevalence/risk, including, but not limited to, wildlife risk mitigation commitments by producers, livestock movement controls, and establishing surveillance zones surrounding positive livestock.
- USDA should support research to identify tools (e.g., vaccination) and strategies (e.g., bait delivery strategies) to reduce the prevalence of bTB in wildlife and institute those strategies, as appropriate.
- State and federal animal health authorities should review existing control strategies in other countries where wildlife species are identified as reservoirs with the aim to modify them for our own purpose.
Follow-up on recommendations regarding Diagnostic Testing Limitations and Needs resulting from “The Future of the National Tuberculosis Program”, USAHA meeting in Denver, CO, July 20-21, 2009

Mitchell V. Palmer
USDA-ARS

Recommendation #1A: Identify funding for research and development of new TB tests and vaccines. Prioritize funding to use resources most efficiently.

Follow-up: USDA’s research and development efforts on tuberculosis diagnostics and vaccines are conducted primarily through the Agricultural Research Service (ARS), specifically the National Animal Disease Center (NADC) in Ames, IA. Objectives of the bovine tuberculosis research effort in USDA are:
1. Characterize the immunopathogenesis of \( M. \text{bovis} \) infection in cattle and deer.
2. Determine new strategies for the detection of \( M. \text{bovis} \) infection in cattle and white-tailed deer.
3. Develop new tuberculosis vaccines.

ARS, APHIS Veterinary Services (VS) TB Program Staff, Center for Veterinary Biologics (CVB), and industry scientists continue to collaborate in the evaluation of promising tests for bovine tuberculosis. Limited funding requires prioritization and investigation of only the most promising tests. In spite of limited funding, since 2000, USDA scientists have produced >120 peer-reviewed scientific manuscripts, representing dozens of experiments and projects on tuberculosis transmission, pathogenesis, diagnostics, and vaccines. Since 2009 12 peer-reviewed scientific papers on tuberculosis diagnostics have included ARS, APHIS, and industry scientists as co-authors.

Recommendation #1B: Use TB positive herds to obtain samples for use in test evaluation, licensing, and approval.

Follow-up: USDA’s APHIS VS and ARS have a rich history of agency cooperation in regards to maximizing information gained from TB positive herds. Such cooperation has increased over the past 5 years yielding presentations and publications obtained from TB positive dairy herds in New Mexico, Colorado, and Mexico. Similarly, information has been gleaned from research on TB positive deer, both wild and captive. A few of the presentations and publications resulting from such cooperation include:

• Evaluation of the interferon gamma assay and comparative cervical tuberculin (CCT) performance in a Colorado TB infected dairy - MC Antognoli et al., USAHA 2010.

• Bovine tuberculosis in a Nebraska herd of farmed elk and fallow deer: A failure of the tuberculin skin test and opportunities for serodiagnosis. WR Waters et al., Vet Med Int 2011 Apr 14:953985.


Recommendation #1C: Conduct research on PCR tests to reduce costs of bacteriological testing.

Follow-up: Joint ARS and APHIS-VS efforts continue on investigating the methods and feasibility of PCR testing of tissues, as evidenced by publications such as, “Improved specificity for detection of Mycobacterium bovis in fresh tissues using IS6110 real time PCR” by TC Thacker et al., BMC Vet Res 2011; 7:50.

Recommendation #2: Immediately acquire a serum bank of known TB-positive and negative cattle.

Follow-up: In 2008 USDA-APHIS-VS, dedicated funds to create a serum bank for use in evaluation of TB serological tests. The bank is housed at the National Veterinary Services Laboratories (NVSL) in Ames, IA and was established with the following goals:

1) Collect well-characterized samples that can be used in the development and evaluation of serum based diagnostic tests for bovine tuberculosis.
2) Collect 1,600 samples from TB negative cattle and white-tailed deer.
3) Collect 250 samples from TB positive cattle.
4) Collect as many samples as possible from white-tailed deer.
5) Obtain samples from the U.S., Canada, Mexico and the United Kingdom.

At the close of FY 2010 approximately 2,730 bovine samples had been collected, 418 of which were from TB positive animals and 2,996 deer samples had been collected, 88 of which were from TB positive animals.

Recommendation #3: Identify 1 reviewer from the Center for Veterinary Biologics (CVB) for new TB tests to provide consistency. Use “conditional license” status to allow experimental tests to be used in parallel with existing tests to compare test performance. Clarify requirements and coordinate test evaluation with CVB, TB (Scientific Advisory Subcommittee) SAS, and TB Program Staff.

Follow-up: One CVB veterinarian reviews applications for new diagnostic tests for bovine tuberculosis. The “conditional license” status has
been available, but is seldom requested. In 2008 an ad-hoc USAHA TB Subcommittee on Diagnostic Test Review drafted a document entitled; “Criteria for evaluating experimental tuberculosis test performance for official test status”. This document, published in 2008 USAHA Proceedings, outlines phases through which a candidate diagnostic assay must pass for consideration as an approved test for use in the national eradication program. In 2010, in accordance with 9 CFR 103.3, the requirement of CVB licensure was added for phase I completion. 9 CFR 103.3 requires CVB approval for interstate shipment of biological products.

Recommendation #4: Explore the feasibility of a milk test for TB.

Follow-up: USAHA TB SAS and APHIS TB Program staff have considered and reviewed data from developers of milk-based detection of *M. bovis*. As with any test, factors such as sensitivity, specificity, proposed use in the eradication program, side–by-side comparison with existing tests, and ramifications of a non-negative result must all be considered.

Recommendation #5: Ongoing, interim work by the TB Scientific Advisory Subcommittee (SAS) should continue year-round outside of the official USAHA meeting.

Follow-up: According to the 2008 USAHA document, “Criteria for evaluating experimental test performance for official test status” “Data may be submitted to the TB SAS for review at any time. The TB SAS will review the data by conference call/email or at the regularly scheduled annual subcommittee meeting. The recommendation of the TB SAS will be submitted to the Chair of the TB Committee. The TB Committee Chair will determine whether the recommendation will be immediately released to the TB Committee or held until the annual meeting.”

In summary, many of the recommendations concerning the needs and limitations of bovine tuberculosis diagnosis were in place in 2009. The remaining recommendations have since been implemented and exist in various stages of progression.

Report on Surveillance, Traceability and Investigative Deficiencies:

A summary of key accomplishments and future actions that VS plans to complete that are relevant to recommendations from the 2009 Tuberculosis (TB) symposium in Denver sponsored by USAHA; specifically Session IV: Surveillance, Traceability, and Investigative Deficiencies from the symposium. Topics that were of concern in Denver include slaughter surveillance, granuloma submission standards for adult as well as fed cattle, traceability, and issues under consideration for the proposed TB-brucellosis rule. Several activities are underway supporting TB surveillance including: VS visits to slaughter plants, monitoring granuloma submissions, quarterly meetings with FSIS, and a pilot study for fed-cattle granuloma submission.
VS has adopted a flexible approach to disposition of TB herds. In collaboration with State officials, VS decides whether to depopulate or enter into a test and removal program. The decision is informed partially by initial test data analysis that predicts probability of success versus cost of test and removal. The current traceability rule is open for public comment with sections pertinent to TB. Items under consideration in the proposed TB-brucellosis rule include: captive cervid testing, recordkeeping for feedlots, prioritization for trace-outs, and standards for Qualified Accredited Veterinarians.
Over the past fifteen years the U.S. has experienced an average of ten or more newly infected herds annually. Many of these infected herds have been disclosed in states that have been Tuberculosis free for many years. The size of the infected herds has increased, increasing the cost of herd depopulation. At the same time the apparent in-herd prevalence of Tuberculosis has remained low in the vast majority of infected herds. Over two years ago USDA-APHIS-VS began consideration of proposals to change the management of Tuberculosis and Brucellosis in the U.S.

Many factors have been identified as impacting Tuberculosis eradication. These include imports, interstate movement, diagnostic tests lacking sensitivity and specificity, improper application and reading of CFT, wildlife reservoirs, negative impacts on a statewide basis under the current state classification system for a single infected herd and inadequate traceability of trace outs and sources.

The frameworks for the national tuberculosis and brucellosis programs provides for increased flexibility for handling infected herds. However many questions remain that must be answered in any future rulemaking. What will trigger state program reviews? How and when will results of the reviews be communicated? Who will contribute to the reviews? What will define an epidemiologically sound disease investigation? How will resources be fairly distributed across the fiscal year? Will creating a consistent, inconsistent classification system motivate or demotivate producers and accredited veterinarians?

While flexibility in managing infected herds will be useful, we must avoid the appearance of being arbitrary and capricious. Regulatory officials need and producers deserve program standards that are spelled out and adopted by rulemaking for their protection. Without this there will be legal challenges delaying herd clean-ups no matter if test and remove or depopulation fits a statistical model.

Key to any future eradication efforts is complete transparency in the program while protecting producer confidentiality. Information on disease investigation efforts must be clearly and rapidly communicated to all stakeholders. Failure to address all the factors and questions pertaining to the Tuberculosis program, in the U.S., will also result in the continued failure of eradication efforts.
The Committee met on October 4, 2011 at the Adam’s Mark Hotel in Buffalo, New York, from 8 a.m. – 12 p.m. There were 33 members and 38 guests present.

Pneumonia in Bighorn Sheep (BHS)
Peregrine Wolff, Nevada Department of Wildlife

This review will address what is new in 2011 for the following topics concerning bighorn sheep pneumonia and bighorn sheep / domestic sheep interactions; collaboration with the domestic sheep industry, policy, research, and publications.

Collaborative efforts with the domestic sheep industry:
American Sheep Industry (ASI) task force on bighorn / domestic sheep invited representatives from the state sheep producers, livestock veterinarians, state departments of Agriculture, state and federal land
management agencies (U.S. Forest Service and Bureau of Land Management), and state wildlife managers for a meeting, to discuss “Strategies For The Coexistence Of Domestic Livestock And Bighorn Sheep On Public And Private Lands.” The meeting was held during the national sheep industry convention on January, 20, 2011 in Reno, Nevada. Dr Jim Logan was instrumental in organizing the meeting. The meeting was intended to gather interested individuals together with the goal of taking “…a fresh look at the issue of possible conflict that can arise when domestic and bighorn sheep come in close proximity to one another. The discussion will concentrate on strategies that have proven to be helpful and beneficial in dealing with this conflict, which will hopefully lead to strategies for the coexistence of domestic livestock and wild sheep on public and private lands.”

The ASI proposed a coalition that would be formed to develop a working framework “to support the sustainability of domestic sheep grazing operations on public lands across the Western United States while maintaining the viability of bighorn sheep populations where appropriate.” This coalition would be made up of representatives from the participating states, sheep industry, and departments of agriculture, wildlife management, and natural resources or public lands management. Representatives of Federal land management agencies and researchers would contribute in an advisory role.

The goal of the coalition would be to develop a framework to be used by state and federal land management agencies to minimize or eliminate conflict between domestic sheep and bighorn sheep.

The January meeting Agenda included presentations on
- Open range, its viability and importance to both species
- Economics of sheep grazing in the west
- Economics and importance of sheep grazing in Wyoming
- Presentation of the Wyoming model for management of domestic sheep and bighorn sheep on public lands
- Western Association of Fish and Wildlife Agencies (WAFWA) and Wild Sheep Foundation perspective
- Research updates

Discussion followed on how to develop a path forward.

A day and one-half follow up meeting was held in June in Denver, Colorado and included the same mix of participants. The first day included presentations on the following:
- An overview of disease issues
- Updates on research with a focus on vaccination strategies for Pasteurellacae sps. in bighorn sheep
- Updates from the USFS

Breakout sessions followed where all participants addressed the major critical needs within three categories: research, management and policy.
The groups were fairly consistent in their responses. Summary points within these categories are as follows:

**Research:**
- “Managed Separation” allows flexibility (specific habitats, landscapes and situations)
- No new best management practices (BMPs) - synthesis of existing lists
- Evaluate BMP’s “on the landscape,” and under-controlled conditions
- Vaccine for both BHS and domestic sheep (DS) - emphasis on DS
- Genetic selection of DS that do not shed *M. haemolytica* with high leukotoxin levels. Make a safer domestic sheep
- Genetic selection of BHS for disease resistance survival
- Examine populations of DS and BHS that co-exist w/out die-offs
- The issue must be looked at as a health issue only, not as an issue of public grazing
- Evaluate available data - details and statistics

**Management:**
- All work must be done with trust, honesty and communication
- “Effective Separation” best strategy
- Identify and analyze alternative animal unit months (AUMs) or allotments for DS, including “dual use” – (identify currently open allotments for displaced bands of domestic sheep)
- Evaluate BMPs, and quantify what works to stop sheep from wandering into each other’s territory
- What is “acceptable risk” in BHS populations

**Policy:**
- Use state models (WY) for overall management model for the co-existence of domestic and bighorn sheep.
- Collaborative group needed, to create accountability for finding a solution
- Industry (ASI) and advocacy (WSF) collaborate (research / accountability)
- Clarify federal and state policies for BHS management
- Implement policy from D.C. down to state USFS and BLM managers
- Collaboration between USFS, BLM and State Wildlife Managers
- Develop local working groups that include input from all stakeholders

The group also agreed on the following Consensus Statement:

*There should be efforts to consolidate existing BMPs, validate (through research) select BMPs and provide BMP recommendations to areas of concern. Recognizing that unique situations require unique solutions, area-specific BMPs should be identified, implemented and monitored. We already have the BMPs identified; they just need to be consolidated into one document that would allow*
Policy:
H.R. 2584 Appropriations Bill for Department of Interior, Environment and related agencies.
Representative Michael Simpson, Chair of the House Interior and Environment Appropriations Sub-committee added Section 442 to the Appropriations bill.
Domestic livestock grazing sec. 442
None of the funds made available by this Act or any other Act through fiscal year 2016 may be used to plan or carry out any action or any subsequent agency regulation for managing bighorn sheep (whether native or nonnative) populations on any parcel of Federal land (as defined in section 3 of the Healthy Forests Restoration Act of 2003 (16 U.S.C. 6502) if the action may or will result in a reduction in the number of domestic livestock permitted to graze on the parcel or in the distribution of livestock on the parcel.
Both WAFWA and WSF submitted letters to Representative Simpson urging removal of Section 442 from the Bill. The inflammatory nature of the section’s language was felt to potentially undermine the major efforts of domestic sheep and bighorn sheep managers to work collaboratively towards insuring that both species have a place on public range lands.

United States Forest Service /Bureau of Land Management
In August a directive from USFS Associate Deputy Chief, Jim Pena directed the forest managers that when making decisions that required National Environmental Policy Act (NEPA) analysis to utilize methodologies used in the Payette analysis (established as the “best available science”) to evaluate risk assessment and directive guidelines for developing a bighorn sheep population viability analysis.
The goal of the risk analysis is to current data and science to assess risk of contact (low, moderate, high) based on spatial and temporal overlap between allotments and bighorn sheep herds. The goal of these risk analysis continues to be to provide for separation on forest land if persistence of bighorn sheep populations is a management priority.
Both USFS and BLM are working with states to map wild sheep distribution and vacant/active domestic sheep and goat grazing allotments. In addition to maps habitat modeled by the source habitat models or state specific models will be incorporated where available these maps are critical for conducting and standardizing a qualitative risk assessment for bighorn sheep across the western states.

Research:
Vaccination
Dr. S. Srikumarin, Washington State University, has been working on developing an inactivated vaccine against *M. haemolytica* for use in bighorn sheep populations at risk of encountering domestic sheep. In preliminary trials the vaccine has been shown to be safe and effective when animals are challenged with *M. haemolytica*. Currently the vaccine regimen would require booster every six mos. and delivery of the vaccine into free-ranging populations would be challenging. Dr. Srikumarin is investigating the use of a live vaccine delivered in a pelleted food source.

**Sinus tumors of rocky mountain bighorn sheep in Colorado**

Dr. Karen Fox, Colorado State University, has been investigating the incidence of sinus tumors recognized in a number of herds of RMBHS in Colorado. Tumors have been found within maxillary, frontal and corneal sinuses in up to 25% of examined heads from select herds. The condition appears somewhat similar to enzootic nasal tumor virus a disease of domestic sheep and goats. Further studies are needed to determine the causative agent and the prevalence in herds within and outside of Colorado. Dr. Fox is currently seeking samples from both affected and unaffected animals.

A number of publications have been published in 2010 / 2011, which addresses bighorn sheep pneumonia. These publications are available on the University of California (Davis) Wildlife Health Center website dedicated to Wild and Domestic Sheep Disease. (http://www.mwvcrc.org/content/view/122/102)


**Management of Brucellosis in Elk and Bison in Wyoming**

Terry Kreeger, Wyoming Game and Fish Department

In compliance with the newly-developed Designated Surveillance Area (DSA), the Wyoming Game and Fish Department, in coordination with the Wyoming Livestock Board, will conduct enhanced surveillance for brucellosis in elk. The surveillance will be concentrated around the periphery of the DSA and will be comprised of three tiers of decreasing priority. Tier One, the highest priority, will focus on the southern boundary of the DSA where there is currently little data on elk seroprevalence. Surveillance will be conducted...
through a combination of hunter blood kits and additional personnel to sample elk in the field.

Update on Chronic Wasting Disease in the United States
Tom Gidlewski, USDA-APHIS, National Wildlife Research Center

It has been roughly a decade since we learned that chronic wasting disease (CWD) is not confined to Colorado and Wyoming. During this time funds were made available for extensive wildlife surveillance for CWD and numerous infected areas were discovered. This 2011 update on chronic wasting disease in the United States reviews the current status of infected states including the rate of disease spread as well as the success of management efforts. CWD current and applied research is reviewed. It appears that elimination of CWD in established populations is very unlikely and future efforts need to be directed toward minimizing the spread of the disease into unaffected areas. Hunters are apparently unwilling to participate in the drastic efforts necessary to severely reduce a cervid population to the level necessary to affect CWD transmission. We now know that the CWD agent is readily excreted in clinical animals and persists in the environment markedly facilitating transmission. Hopefully, technological advances such as vaccination will provide the necessary tools for intervention.

How can we do more with less? Techniques to increase efficiency of chronic wasting disease surveillance
Dr. Daniel P. Walsh, National Wildlife Health Center, United States Geological Survey

With drastic reductions in resource allocations for chronic wasting disease (CWD) surveillance, pressure has been placed upon wildlife management agencies to continue to conduct necessary and oft times mandated disease surveillance efforts with minimal budgets. Under these constraints, there is an increasing demand for efficient and economical surveillance systems for disease detection among wildlife managers. In an effort to meet these needs, we developed a weighted surveillance system for use in detection of CWD in regions where it presently is not known to occur. Our weighted surveillance approach exploits inherent differences in prevalence among demographic groups arising from the CWD disease processes and dynamics to increase efficiency in disease detection. We employ a Bayesian statistical estimation procedure that allows us to account for the uncertainty in estimates of these inherent differences within a rigorous framework. The overall structure of our weighted surveillance technique is constructed using a “points” system, which allows for samples to enter the CWD surveillance stream from multiple sources, while being intuitive and easily applied by wildlife managers. We believe that our weighted surveillance approach provides a viable alternative to traditional surveillance approaches, and because of its potential to increase efficiency and thereby
produce economic benefits; it represents the next step in the evolution of CWD surveillance.

Enteric Pathogens, Wildlife, and Public Health: An emerging issue for wildlife, agriculture and public health agencies

Colin Gillin1*, Anne Justice-Allen2, Julia Burco1, Sarah Smolley3, Oregon Department of Fish and Wildlife1, Arizona Game and Fish Department2, University of California, Davis School of Veterinary Medicine3

According to the Centers for Disease Control and Prevention, food-borne intestinal disease in the U.S. affects 1 in 6 U.S. citizens annually (48 million), with 128,000 people hospitalized, and 3,000 deaths. Enteric disease from food-borne pathogens is often widespread due to the extensive and well-structured food distribution system within the U.S. Overall, rates have been declining for the past 10 years for disease due to the 4 of 5 (Campylobacter, E. coli O157, Listeria, Salmonella) major pathogens with food-borne disease due to Vibrio increasing.

The most common food-borne disease pathogens tracked by the CDC are Campylobacter, E. coli O157, Listeria, Salmonella, and Vibrio. Of these, 11% of the outbreak infections were caused by Salmonella spp. followed by Campylobacter spp.. Thirty-five percent of the cases resulted in hospitalizations and were caused by non-typhoidal Salmonella with 15% caused by Campylobacter spp.. Cases of enteric infection that resulted in death involved 28% from non-typhoidal Salmonella and 19% from Listeria monocytogenes.

Recent efforts by produce growers and buyers and other stakeholders has led to agreements to improve food safety. In 2007, California and Arizona developed and enrolled producers in Leafy Green Marketing Agreements. These agreements describe Best Management Practices (BMP) and Good Agricultural Practices and Metrics that detail an audit procedure throughout the production and food distribution process. It requires actions in response to identified risks such as wildlife or domestic animal tracks or fecal material found in fields at audit, and flood events or the occurrence of increased risk land use practices (livestock, flood irrigation) on adjacent lands and field worker hygiene. Animals such as deer, swine, cattle, goats, and sheep are considered animals of significant risk and identification of animals or animal sign on crop land areas is analyzed by a trained auditor. Testing is required for many situations where food safety security has been compromised.

As part of this risk determination, Hazard Analysis Critical Control Point (HACCP) plans are used for determining risk assessments that quantify the level of risk and for implementing management practices that are proven to be effective at reducing risk of contamination. HACCP is a systematic preventive approach to food safety and pharmaceutical safety that addresses physical, chemical, and biological hazards as a means of prevention rather than finished product inspection - used at all stages of food production and preparation processes. The stages of HACCP include:
WILDLIFE DISEASES

• Conduct a hazard analysis
• Identify critical control points
• Establish critical limits for each critical control point
• Establish critical control point monitoring requirements
• Establish corrective actions
• Establish procedures for ensuring the HACCP system is working as intended
• Establish record keeping procedures

Within this process wildlife management agencies should encourage management of wildlife resources in potential conflict areas that balances public health with management objectives. Stakeholder involvement is important throughout the process and should include growers, buyers, public health and other regulatory agencies including state agriculture animal health personnel. These approach will help in problem definition and identification of known contributors to disease occurrence.

Communication with and education of stakeholders in research based information concerning wildlife, livestock and human sources involved in crop contamination should include growers and buyers, regulatory and governmental agencies, and legislators. Wildlife management agencies should educate their staff concerning economics and production constraints for growers, liability of buyers and growers, and public health risks and impacts of food-borne disease. It should also be the responsibility of wildlife agency management and research personnel to educate and communicate the risks of wildlife pathogens to food-borne illness with the public health investigators.

As an example of a recent outbreak implicating wildlife, an Oregon case was presented that implicated deer droppings as a confirmed primary source of contamination at a strawberry farm. The deer fecal material contained the same strain of *E. coli* O157:H7 that sickened people in Multnomah, Washington, Clackamas, Yamhill and Clatsop counties. A newspaper article stated that lab testing confirmed deer as the source of the outbreak, according to the Oregon Public Health.

Generally, wildlife does not constitute a significant source of enterohaemorrhagic *E. coli* (EHEC) O157 but sporadic isolation of the bacteria likely reflects environment-mediated transmission from humans and animal reservoirs (Ferens and Hovde, 2011). Collective studies looking at multiple wildlife species confirm this statement by either failing to document the presence of any *E. coli* O157:H7 (Adesiyun, 1999; Bardiau et al., 2010) or showing very low prevalences (0.79% in white-tailed deer, 0.33% in pooled bird samples)(Rice et al., 2003). A current study screening numerous free-ranging wildlife species in the central coastal counties of California has demonstrated a 0% (0/445) prevalence of *E. coli* O157:H7 in coastal black-tailed deer (*Odocoileus hemionus columbianus*), 2.0 % (3/149) in Tule Elk (*Cervus Canadensis nannodes*), and 4.4% (9/206) of wild pig (*Sus scrofa*) (Gordus and Atwill, 2011). In independent studies in free-ranging deer
across the United States, deer have generally been shown to infrequently shed *E. coli* O157:H7 in their feces, with prevalence ranging from 0.0 to 11% (Figure 1).

<table>
<thead>
<tr>
<th>Study</th>
<th>Animal source</th>
<th>Fecal collection</th>
<th>Sample size</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renter et al., 2001</td>
<td>wild</td>
<td>rectum</td>
<td>1,426</td>
<td>0.25</td>
</tr>
<tr>
<td>Rice, et al., 2003</td>
<td>wild</td>
<td>mixed</td>
<td>630</td>
<td>0.79</td>
</tr>
<tr>
<td>Sargeant, et al., 1999</td>
<td>wild</td>
<td>ground (fresh)</td>
<td>212</td>
<td>2.4</td>
</tr>
<tr>
<td>Fischer et al., 2001</td>
<td>wild</td>
<td>ground (fresh)</td>
<td>469 (1997), 120 (1998)</td>
<td>0.6 (1997), 0 (1998)</td>
</tr>
<tr>
<td>Gordus and Atwill, 2011</td>
<td>wild</td>
<td>rectum</td>
<td>445</td>
<td>1.8</td>
</tr>
<tr>
<td>Dunn et al., 2004</td>
<td>wild</td>
<td>rectum</td>
<td>338</td>
<td>0.3</td>
</tr>
<tr>
<td>Cody et al., 1999</td>
<td>wild</td>
<td>ground (unknown)</td>
<td>9</td>
<td>11.1</td>
</tr>
<tr>
<td>Keene et al., 1997</td>
<td>wild</td>
<td>ground (unknown)</td>
<td>32</td>
<td>9.4</td>
</tr>
</tbody>
</table>
The two studies documenting the highest prevalences in deer include an investigation of E. coli infection traced to deer meat, where 3 of 32 fecal pellets (Keene et al, 1997) and an investigation into human E. coli O157:H7 infections linked to unpasteurized apple juice that demonstrated one of nine (11%) fecal samples to be positive (Cody et al., 1999). Both of these studies had extremely small sample sizes and were based on collection of fecal samples collected from the ground that were exposed to the environment, and potentially other contamination sources, for an unknown period of time. In the former deer meat case, prevalence in feces was not a factor in the outcome as the consumed meat could have been contaminated from a variety of other contact sources.

In the Oregon case, deer pellets, soil and strawberry plants were tested for the presence of the E. coli pathogen. However, many other factors associated with wildlife should have been considered including the period of time the deer feces was exposed to the environment and pathogens from external sources such as field run-off and flooding, the dry, pelletized nature of deer feces in late July, and other information about wildlife that could have been provided by wildlife agency staff. It is also possible both deer and the people infected with E. coli from contaminated strawberries may well have been the secondary recipients from an unidentified primary source.

Other information important to the investigation and some that was not available included information about the health of farm workers who were also present in the fields at the time of the outbreak, as well as samples from livestock and other animals, water, livestock manure sources, and potentially contaminated run-off from adjacent fields. Without a thorough investigation of all possible sources, it is often very difficult to identify a primary source but more accurately a list of possible sources. Due to the complexity of many food-borne illness investigations, there is an identified need for a multi-discipline approach with the inclusion of input from all subject matter experts and inclusion of all agencies involved (Fish and Wildlife, Agriculture, Public Health).

The implication of wildlife in cases of food poisoning and contamination of crops can result in consequences to the wildlife resource including reduced wildlife numbers through increased harvest, habitat access reduction through fencing and other physical barriers leading to loss of local migration corridors and reduced access to water sources, decrease in biodiversity, increased crop depredation on adjacent properties (displacement, density issues, habitat degradation), and a fear of wildlife associated with disease by the public.

References
Bardiau M, Grégoire F, Muylaert A, Nahayo A, Duprez JN, Mainil J, Linden A. 2010. Enteropathogenic (EPEC), enterohaemorrhagic (EHEC) and


Keene WE, Sazie I, Kik J, Rice DH, Hancock DD, Balan VK, Shao T, Doyle MP. 1997 An outbreak of *Escherichia coli* O157:H7 infections traced to jerky made from deer meat. JAMA 277:1229-1231.


**SCWDS Hemorrhagic Disease Surveillance Update**

Mark Ruder, Daniel Mead, and David Stallknecht, Southeastern Cooperative Wildlife Disease Study, University of Georgia

An overview of epizootic hemorrhagic disease viruses (EHDV) and bluetongue viruses (BTV) isolated by SCWDS during the 2010 and 2011 transmission seasons was presented. During 2010, 14 viruses were isolated from the 85 virus isolation attempts made, representing 21 states and 7 species (59 white-tailed deer, 19 mule deer, 1 key deer, 3 elk, 1 unknown cervid, 1 cow, and 1 sheep). Table 1 lists virus isolates.

During the summer and early fall of 2011, SCWDS has received numerous reports of suspected hemorrhagic disease in free-ranging white-tailed deer populations. As of September 30, 2011, there have been 37 viruses isolated after 84 virus isolation attempts, representing 19 states and multiple species (76 white-tailed deer, 4 mule deer, 2 elk, and 2 unknown cervids). Table 2 lists the viruses isolated thus far in 2011.
TABLE 1: A list of the 14 viruses isolated from a total of 85 individual animal submissions made to SCWDS during 2011.

<table>
<thead>
<tr>
<th>STATE</th>
<th>COUNTY</th>
<th>MO</th>
<th>SPECIES</th>
<th>VIRUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALABAMA</td>
<td>Geneva</td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Covington</td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nov.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>ARKANSAS</td>
<td>Jefferson</td>
<td>Aug.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-6</td>
</tr>
<tr>
<td>FLORIDA</td>
<td>Lee</td>
<td>Jul.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>BTV-12</td>
</tr>
<tr>
<td></td>
<td>Dixie</td>
<td>Sep.</td>
<td>WTD&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>MARYLAND</td>
<td>Anne</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Arundel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEW JERSEY</td>
<td>Salem</td>
<td>Sep.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>NEW MEXICO</td>
<td>Torrance</td>
<td>Oct.</td>
<td>elk&lt;sup&gt;c&lt;/sup&gt;</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>NORTH CAROLINA</td>
<td>Person</td>
<td>Sep.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
</tbody>
</table>

<sup>c</sup> captive animal

WTD = white-tailed deer
TABLE 2: A list of the 37 viruses isolated from a total of 84 individual animal submissions made to SCWDS during 2011 (current as of September 30, 2011).

<table>
<thead>
<tr>
<th>STATE</th>
<th>COUNTY</th>
<th>MONTH</th>
<th>SPECIES</th>
<th>VIRUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALABAMA</td>
<td>Marshall</td>
<td>Jul.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Russell</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>FLORIDA</td>
<td>Wakulla</td>
<td>Sep.</td>
<td>WTD</td>
<td>pending</td>
</tr>
<tr>
<td>ILLINOIS</td>
<td>Marion</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
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<td>KANSAS</td>
<td>Anderson</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Butler</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Coffey</td>
<td>Sep.</td>
<td>WTD</td>
<td>pending</td>
</tr>
<tr>
<td></td>
<td>Cowley</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Leavenworth</td>
<td>Sep.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Lyon</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Wilson</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>KENTUCKY</td>
<td>Hopkins</td>
<td>Sep.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Union</td>
<td>Jul.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>LOUISIANA</td>
<td>Lafourche Par.</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>MARYLAND</td>
<td>Kent</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>MISSOURI</td>
<td>Holt</td>
<td>Sep.</td>
<td>WTD</td>
<td>pending</td>
</tr>
<tr>
<td>MONTANA</td>
<td>Musselshell</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Phillips</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Powder River</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Valley</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Yellowstone</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
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<tr>
<td>NEW JERSEY</td>
<td>Mercer</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sep.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
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<td>Middlesex</td>
<td>Sep.</td>
<td>WTD</td>
<td>pending</td>
</tr>
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<td>Morris</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sep.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td>NORTH CAROLINA</td>
<td>Gates</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
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<td>PENNSYLVANIA</td>
<td>Yancey</td>
<td>Sep.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td>Erie</td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Aug.</td>
<td>WTD</td>
<td>EHDV-2</td>
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Update on Bat White Nose Syndrome in North America
Jonathan Sleeman*, David Blehert, USGS, National Wildlife Health Center, Madison, Wisconsin

White-nose syndrome (WNS) in cave-hibernating bats was detected in five new U.S. states (Maine, North Carolina, Ohio, Indiana, Kentucky) and two new Canadian provinces (New Brunswick, Nova Scotia) during the Winter 2010/2011 season. This brings the total number of confirmed WNS-positive states and provinces to 16 and 4, respectively, since the disease was first detected in New York in February 2006. The genetic signature of Geomyces destructans, the causative agent of WNS, was also detected on bats in 3 additional states including Delaware, Missouri, and Oklahoma in the previous winter season, although the disease has yet to be detected in these states. No significant westward expansion of WNS was detected this winter beyond Trigg County, Kentucky. The disease continued to spread into new counties within WNS-confirmed states and provinces (Maryland, Virginia, West Virginia, Pennsylvania, Connecticut, Tennessee, Quebec, and Ontario). With the exception of one New Brunswick hibernaculum, where an estimated 4,980 bats died, all other new locations reported minimal to no bat mortality at the time of their surveys. Several surveys were conducted outside the entrances of the hibernacula only and may not reflect the true mortality counts. Also, because winter bat surveys are typically conducted once during the season to minimize disturbance to hibernating bats, total mortality estimates are not available until the following season when returning population counts are assessed. Thus far, WNS has not been confirmed in any new bat species this season. Six species, including Little Brown, Northern Long-eared, Tri-colored, Indiana, Eastern Small-footed, and Big Brown bats, are known to be susceptible to WNS. Genetic evidence of Geomyces destructans has been identified on three additional species (Southeastern myotis, Cave myotis, and Gray bats). For the latest WNS updates, consult the USGS-NWHC Wildlife Health Bulletins. http://www.nwhc.usgs.gov/publications/wildlife_health_bulletins/index.jsp.

Current bat submission guidelines to NWHC are available at: http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/USGS_NWHC_Bat_WNS_submission_protocol.pdf

The USGS National Wildlife Health Center (NWHC), along with many partners, continues to play a primary role in WNS research, including WNS transmission/pathogenesis/recovery studies, development of improved tools.
for molecular detection of *G. destructans*, and investigation into the microbial ecology of *G. destructans* in bat hibernacula.

1) Studies to determine the role of *G. destructans* as the cause of WNS and modes of fungal transmission have been completed, and a manuscript describing study results is in review. As a continuation of this work, NWHC scientists are collaborating with others to complete laboratory experiments to determine how/why fungal skin infection kills bats. The leading hypothesis is that fungal damage to bat wing skin catastrophically disrupts physiological homeostasis during hibernation. Additionally, NWHC scientists recently published findings demonstrating that bats with WNS can readily recover from the disease with provision of supportive care (food, water, and warm temperature). These results confirm that hibernation predisposes bats to infection by *G. destructans* and further indicate that management actions to reduce infection severity may allow bats to survive and naturally recover from WNS following spring emergence.

2) Scientists at the NWHC recently developed and published a rapid PCR test for detecting DNA from *G. destructans* on bat wing skin and have shared this new test with multiple laboratories as a much needed diagnostic tool. Additionally, work at the NWHC is ongoing to standardize non-invasive techniques (i.e. swabbing) to collect fungal samples from bat skin, and efforts are underway to develop/qualify a new quantitative PCR method for detecting *G. destructans* with enhanced specificity necessary to analyze environmental samples.

3) An environmental survey of caves was conducted by USGS scientists in collaboration with several states to characterize the distribution of *G. destructans* in cave soil. This study demonstrated that DNA from *G. destructans* was present in soil collected only from hibernation sites within the WNS-infested region of the United States. Follow-up analyses further confirmed that the viable fungus was also present in these samples indicating that the environment likely plays a role in the WNS disease/transmission cycle. Bat ecologists from the USGS Fort Collins Science Center have developed and deployed infrared video surveillance systems for use inside bat hibernation sites to investigate potential behavioral links between skin infection by *G. destructans* and WNS mortality. Through a collaborative study with Northern Arizona University, genomic analyses of multiple isolates of *G. destructans* from both Europe and North America suggest that *G. destructans* is an exotic species in North America of European origin. Additionally, a detailed analysis of the role of temperature on the proliferation and persistence of *G. destructans* is underway.

Contacts: David Blehert, National Wildlife Health Center, 608-270-2466, dblehert@usgs.gov; Anne Ballmann, National Wildlife Health Center, 608-270-2445, aballmann@usgs.gov
Newcastle Disease Virus in Wild Double Crested Cormorants
Scott Wright, National Wildlife Health Center, Madison, Wisconsin

Newcastle Disease (NDv) is a well known and serious disease of poultry. It does occur in wildlife as well, specifically Double Crested Cormorants (DCCO). DCCO are widely distributed over the United States as they can exist in freshwater, estuarine and marine habitats. They are also colonial nesting birds often sharing nesting sites with pelicans, gulls and shore birds. This species is apparently especially susceptible to the virus. Even though virus has been isolated in some other wild species it only develops into disease in DCCO. Investigators at the National Wildlife Health Center (NWHC) and others have noted that since the first detected outbreak of NDv in DCCO in 1992, there has been a rough two-three year cycle of outbreaks. Further, while not exclusively there, most outbreaks are clustered in the upper Midwestern United States (the Dakotas, Minnesota, Wisconsin, and Michigan). Adult birds develop an immune resistance to infection with NDv and this can be passed to younger birds protecting them, however, adults do not sustain protection and may become infected themselves again later in life. The virus affects the younger age classes the most as protected young birds have a lasting protection for only about their first 6 weeks. In order to better understand disease periodicity as well as other aspects of the biology of this disease in DCCO, the NWHC launched into a study with cooperators such as the USDA WS, and state wildlife management agencies. Biological samples (cloacal swabs and heart blood) were collected from agency harvested birds from three known positive sites in Minnesota during the summer of 2011. This year was selected because it was immediately after an active outbreak year (2010) in the same area. Birds of all four age classes were collected from all three sites, three times during the season for a total of 540 samples. These samples will be tested in the laboratory at the NWHC by RT-PCR and virus culture and serum will be tested via serum neutralization and ELISA. Testing of this year's samples is being conducted this fall, as the last collection of samples was just completed in August. Information collected from these birds including age data and test results will be used in the development of force of infection models to help better understand disease dynamics of NDv in wild DCCO.

Committee Business

There were no resolutions or business items presented to the Committee.
II. F. 1. 2011 Annual Applied Animal and Public Health Research and Extension Conference
Hosted by the American Association of Extension Veterinarians

Responding to Fiscal Starvation: Navigating Change for California’s Cooperative Extension Program – D. Klingborg


Lead Toxicosis in a Cow/Calf Herd – J. Kennedy

Survey Results of Management, Dairy Animal Care and Quality Assurance Practices, and Bovine Viral Diarrhea on Utah Dairies – K. Rood


Development of an Influenza Risk Assessment Tool – S. Trock

Perceptions Knowledge and Attitudes of Animal Welfare and Beef Quality Assurance of Students engaged in Animal Agriculture Related Curriculum – T. Hairgrove

The Ontario Farm-call Surveillance Project (OFSP): Advantages of an active surveillance program – K. Zurbrigg
RESPONDING TO FISCAL STARVATION: NAVIGATING CHANGE FOR CALIFORNIA’S COOPERATIVE EXTENSION PROGRAM

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In less than twenty years California’s Cooperative Extension program has gone through four separate episodes of acute and significant budget cuts, with a couple of periods of modest growth intermixed. Add to that about 30 years of continuous erosion of Federal support for Cooperative Extension. The picture becomes complete with major cuts from many of California’s counties in response to the recession and unfunded mandates passed to them from the State. The resulting fiscal crisis in UC’s Cooperative Extension program is too deep and too long-standing to be ignored (or to be wasted).

At last year’s meeting I laid the foundation for necessary change and identified our targeted goals.

This year I propose to update the audience on how our change effort has evolved, associated with internal and external influences. We’ve had triumphs and failures, and have used a risk assessment and mitigation process to identify and overcome the barriers encountered. We’ll be two years into the change process at the time of this meeting and will share results and insights that should be valuable to others who are or will be facing similar challenges.

We’ve encountered about ten distinct barriers to change, and this talk will focus on how we’ve approached and are overcoming the “top five barriers”, including:

1) Failure to tell our story effectively to all the audiences required to foster support
   o University leadership must appreciate and support Cooperative Extension and the Agricultural Experiment Station
   o State political representatives (Assembly and Senate) need to know who we are and how we help their constituents
   o County political leadership need the same information (and they are the source for state representatives)
   o Congress is an obvious, but more challenging, target for telling our story

2) Lack of critical mass in programmatic areas
   o Loss of Advisors (Agents) and Specialists (currently at ~55% of the level that existed in the 1980’s) with a tsunami of potential retirements in the next 5 years
   o Surviving programs and accumulated expertise is now defined based on retirements, resignations and deaths rather than strategic planning
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- Tendency to “backfill” vacancies, recreating ourselves in our past glory, rather than strategically place new positions to meet future needs.

3) Reluctance of county directors to embrace change
   - Denial that we’re on a new road and not just a short-lived dip in the old one.
   - Selection and development of county-based leadership based on management expertise, not leadership.
   - A preferred learning style in this group that requires detail specific to their local situation in order to understand the proposed change.

4) Senior people in leadership roles wanting to preserve the present until they retire.

5) Need to move away from formula funding and to a competitive Federal funding model.

Results: So far several million dollars saved (and reinvested) by consolidation and cost sharing, eliminating redundant administration, pooling grant programs, launching new multi-entity administrative partnership pilots, enhancing advocacy skills and efforts based on the strategic vision and strategic initiatives and prioritizing reinvestment in new positions as a payoff related to embracing change.
REducing the burden of dairy cow lameness in the Pacific northwest: step 1. estimating lameness prevalence

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Introduction -- Lameness in dairy cattle affects feed intake and milk production, reproduction, increases premature culling and costs producers each time a cow has to be treated. However, just as important as the economic costs are the welfare implications of dairy cow lameness. Each animal welfare audit or assessment for dairy cows in the United States includes the estimation of lameness prevalence in the herd. National dairy industry and dairy cooperative initiatives on animal welfare have set varying herd lameness prevalence thresholds for producers to meet. The national Dairy F.A.R.M. program (to include almost all producers in the United States over the next year) sets a low threshold of 10% or less lameness in the herd (National Dairy FARM Program, 2010). Based on reports from other states and countries, it is likely that a significant proportion (up to 25%) of producers may not meet that goal. However, information on herd lameness prevalence in the Pacific Northwest is unknown and best ways to estimate the prevalence on western-style dairy farms has not yet been reported. A sampling strategy for estimating lameness prevalence in dairy herds using milking order was recently suggested by UK investigators but was developed with herds < 300 cows and few pens (Main et al., 2010). It is not known if this strategy will work with large, western dairies that may have many pens of cows (each with 100-300 cows per pen) and larger herd sizes (>300 cows). Another study looked at estimating lameness prevalence by evaluating back position (arched or not) while cows were standing in head-locks (Thomsen, 2009). It is the purpose of this on-going, dairy industry-funded project to develop lameness prevalence assessment tools for western dairy operations, estimate lameness prevalence to increase awareness by producers, provide a set of investigative tools for identifying farm-specific causes of lameness and costs of remediation, have producers and veterinarians evaluate the assessment and investigative tools, and provide a refined set of tools to the industry. This presentation will describe the project and provide results for the sampling strategy objective as well as describe the investigation tools developed for veterinarians.

Materials and Methods -- Five dairy producers and their veterinarians volunteered to collaborate on this project. Lameness prevalence defined as a locomotion score of 3 or higher in a scoring system (Sprecher et al., 1997) of 1 being normal and 5 being severely debilitated because of lameness) prevalence for the whole herd was determined as well as lameness prevalence by pen and pen type. Locomotion score and parlor exit order were recorded for cows in each pen as they exited the milking parlor. Exit order rank was calculated as exit order divided by the number of cows
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observed per pen. Additionally, lameness prevalence was calculated from a sample of cows in the middle of the parlor exit order using a published calculation to determine sample size. Back position while in the lock-up (arched or not arched) was recorded in pens and lameness prevalence was estimated by calculating the prevalence of cows with an arched back position. Sensitivity and specificity were calculated for the presence of arched back as a test for locomotion score of 3 or greater. All data were analyzed using Microsoft Excel and EpiCalc2000. Additional criteria such as leg and toe posture were also recorded for four farms. Cow files from herd management software programs were obtained for cow identification, lactation number, pen location, and days into lactation on the day of scoring. A meeting with the herd manager/owner and the veterinarian was held at each farm to discuss prevalence by pen, number of cows with scores >3 and next steps to investigate the problem.

**Results** -- On Farm 1 (all Jerseys), we scored 421 cows (85% of the herd). Forty-three or 10.2% of the cows were classified as lame. Pen prevalence ranged from 6 to 16.3%. On Farm 2 (mostly Jersey but some Holsteins and Holstein-Jersey cross-breds) we scored 2354 cows (87% of the herd) and found 10.1% lame with a pen prevalence varying from 4% to 23%. On Farm 3, the lameness prevalence of all cows scored (N=139 Holsteins) 38.1%. Farm 4 had a 21.2% prevalence of the 546 cows (mostly Holstein) scored with pen prevalence ranging from 7 to 42%. Farm 5 had 989 Holstein cows scored for a prevalence of 35.4%. Pen prevalence varied from 12 to 70%.

Preliminary data analysis indicated that for three-quarters of the pens, a sampling strategy using exit order estimated lameness prevalence within 5% of true prevalence. For one-quarter of the pens, lameness prevalence was overestimated by 11% and 12%. The strategy using arched back estimated “true” prevalence within 4% for the herds. Presence of an arched back while standing in the lock-up compared to a locomotion score >2 ranged from 26 to 67% sensitivity and 50 to 92% specificity. Across all the herds, cows with an arched back while standing in the lock-up were 3.7 times more likely to have a locomotion score >2 (95% CI 3.1, 4.4).

**Significance** -- The sampling strategy using milking parlor exit order was effective at estimating herd prevalence when samples from all pens were combined. Pen level variation requires sampling all pens. The presence of an arched back position in cows in lock-ups predicts lameness in those cows, but these preliminary data suggest that this lameness assessment strategy more often underestimates herd prevalence. However, lameness assessment using arched back position has promise for wider adoption as it could easily be incorporated into routine herd management procedures, such as on herd reproductive examination days. Providing prevalence estimates and identifying the specific cows that need immediate attention may motivate producers to investigate the causes of lameness in the herd.
References


LEAD TOXICOSIS IN A COW-CALF HERD

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A two month old crossbred male beef calf was presented for necropsy and diagnostic evaluation. The owner had reported the loss of 15 calves from a herd of 80 pairs. The cows were grazing native pasture with no supplementation and water was provided from the local city water system. No vaccinations had been given to the calves at the time of presentation. One month later a second calf was submitted with the owner reporting an additional 8 losses and two blind calves. The local county extension agent was contacted to do an onsite visit and look for the presence of toxic agents including lead and weeds and to offer a general opinion of the livestock. The history of blindness led to request lead levels in liver tissues which were found to be 110 ppm (>10 ppm considered toxic). No toxic plants were identified but the pasture was suffering from drought conditions. Additionally a large quantity of paint chips was found near a drainage pipe from the adjacent city water facility. Findings prompted that a frozen liver sample from the first calf be tested for lead levels and found to be 160 ppm. Paint chips were analyzed and 10% lead content was detected. Public health officials were contacted along with environmental agencies to address the impact of the findings. This case demonstrated the need and the ability for multiple agencies to communicate and address multifaceted problems and the role the veterinarian plays in our society.
SURVEY RESULTS OF MANAGEMENT, DAIRY ANIMAL CARE AND QUALITY ASSURANCE PRACTICES, AND BOVINE VIRAL DIARRHEA ON UTAH DAIRIES

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A mail-in survey was conducted in Utah to measure the baseline level of awareness and knowledge on dairy animal care and quality assurance (DACQA), formally referred to as dairy beef quality assurance (BQA), and to compare regionally to 2004 Idaho results (Glaze and Chahine, 2008). In 2010, a 30-question survey, with similar questions used by Glaze and Chahine (2008), was mailed to 229 active Utah dairy producers as determined by those licensed to produce milk by the Utah Department of Agriculture and Food. Of those surveyed, 62 (27%) returned a completed questioner. One was excluded because it was a dairy goat operation. The 27% return rate was lower than the 37% Idaho participation rate. The mean number of lactating dairy cows reported was 474 (SD = 797). Respondents indicated that they averaged culling 106 cows per year (SD = 225) which represents a 22% cull rate. Reproductive performance was the highest (31%) ranked reason for culling followed by mastitis and poor milk production (16%), respectively. When asked what format they use to keep records, 68% used a commercial herd record software service. One herd reported using “none.” Sixty-one percent of respondents opined that BQA was either of “high” or “critical” importance in the dairy industry. Five percent indicated that dairy BQA was of “no importance.” When asked if they practice Dairy Beef Quality Assurance for animal care and health, 43 (72%) farmers indicated “yes” while five and ten reported “no” or “don’t know”, respectively. Forty-eight dairy farmers reported using the neck for routine intramuscular injections of cows. The upper rear leg was the next most commonly (21%) reported location. This suggests a misunderstanding of BQA procedures. Respondents indicated that they, followed by the veterinarian, were the person who administered injections most commonly. Seventy-two percent of respondents indicated that the person who administered injections was trained. Fifty-three dairies utilized a veterinarian for regular herd health checks while seven indicated they did not. When asked “who checks for pregnancies on your farm (palpate and/or ultrasound),” 51 respondents indicated “veterinarian”, while 13 indicated “owner or hired employee.” Two dairies reported that they did not check for pregnancy. When asked if bovine viral diarrhea (BVD) had been diagnosed on your dairy, either in calves or cows, in the past 5 years, seven (11%) indicated yes. While 43 (70%) and nine (15%) dairies indicated “no” or “unsure,” respectively. These results will be used to implement better training of dairy animal care and quality assurance for Utah dairy farms.
HELICOBACTER HEILMANNII (NON-H. PYLORI HELICOBACTER) INFECTION: AN UNCOMMON ZOONOSIS?

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A 70-year old male patient from northeast South Dakota presented to a primary care physician with a history of mild epigastric pain and dysphagia. Esophagastroduodenoscopy was performed, revealing signs of moderate gastritis in the gastric antrum. Biopsy specimens histologically confirmed moderate active chronic gastritis, along with the presence of numerous Helicobacter heilmannii organisms. A proton pump inhibitor, metronidazole, and an antibiotic were prescribed, and the patient is currently recovering.

Helicobacter pylori infections have long been associated with chronic active gastritis, gastric ulceration, development of gastric adenocarcinoma, and malignant mucosa-associated lymphoid tissue lymphoma in people. In contrast, Helicobacter heilmannii infections are rarely identified in patients exhibiting similar symptoms and pathology (0.2-6% of cases). Diagnosis of Helicobacter heilmannii infection is made on the basis of histopathologic identification of organisms with characteristic tightly coiled morphology that differentiates them from H. pylori. H. heilmannii is difficult to isolate from human biopsy samples.

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In contrast to its uncommon association with gastric problems in people, H. heilmannii-like organisms are commonly found in the stomach of clinically healthy dogs (67-86%) and cats (41-100%). The pathogenic significance of these organisms in animals is unknown. In animals, these bacteria can be cultured in vitro from gastric samples, but not in fecal material, suggesting an oral-to-oral transmission rather than fecal-oral. In addition, little is known about the anthroponotic potential of such infections.

The patient in this case had frequent contact with a pet dog, which has been clinically normal. Samples were not obtained from the dog in this case, however. Study of the role of this bacteria in human medicine is difficult due to the inability to culture the bacteria in vitro, and due to the rarity of the infection. H. heilmannii infections in people are uncommon and treatable, but when diagnosed may be the source of questions for veterinarians and workers in public health.
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DEVELOPMENT OF AN INFLUENZA RISK ASSESSMENT TOOL

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Influenza virus infections have resulted in millions of deaths and untold millions of illnesses throughout history. Influenza A viruses have 16 hemagglutinin subtypes and 9 possible neuraminidases and all have been found in aquatic birds. These viruses contain eight single-stranded RNA gene segments. Two of these gene segments code for the hemagglutinin and neuramidase glycoproteins on the outer surface of the virus. It is these surface proteins that are largely responsible for triggering the immune response of the host to produce neutralizing antibodies primarily targeting the hemagglutinin protein. The virus has the ability to evade the host response through antigenic drift and shift. This lack of stability is what drives the continual reassessment of the viruses that should be present in human influenza vaccines.

Decisions are made annually approximately 8-9 months in advance of the influenza season for the U.S. regarding what changes, if any, should be made to the vaccine formulation. This advance decision making is required because influenza vaccines take time to manufacture, test and distribute. In addition about 2 weeks are required for adults to generate a protective antibody response. Deliberations also consider which viruses with pandemic potential pose the greatest risk to public health. After an assessment of these viruses with pandemic potential it may be concluded that one or more of these viruses is of enough concern that a high-growth reassortant vaccine candidate should be manufactured, tested in clinical trials and in some circumstances, stockpiled. An example of this is the highly pathogenic avian H5N1 influenza viruses from various genetic clades representing distinct antigenic variants.

During the past year, the CDC has begun to develop a tool to evaluate influenza A viruses that are not circulating in the human population but pose a pandemic risk. The objective is to offer a standardized set of elements or considerations to be applied when evaluating pre-pandemic viruses. Currently the tool under consideration is a simple, additive model based on multi-attribute decision analysis. The model includes elements that address the properties of the virus itself, the attributes of the population, considers both the veterinary and human findings, and integrates both laboratory and field observations. The elements should be independent and should not influence other components of the model. Additionally each element is assigned a weight such that all elements are not considered of equal importance within the model. Currently there are 10 elements under consideration.

Elements considered include the Animal Species Distribution, Genomic Variation, Population Immunity, Disease Severity and other factors. A
description of the tool, the elements and the use of the model will be presented.

The model is being developed and shared with animal health partners and similar considerations could be useful if applied to development of well-matched animal influenza vaccines, particularly swine vaccines. The ultimate goal is to identify an appropriate vaccine candidate virus and prepare a human vaccine targeting this emerging virus before it adapts to infect and efficiently transmit in susceptible human populations. This pre-pandemic preparation would allow production of ample vaccine to offer to the public in a timely manner --- a strategy that could save lives and mitigate illness.
PERCEPTIONS KNOWLEDGE AND ATTITUDES OF ANIMAL WELFARE AND BEEF QUALITY ASSURANCE OF STUDENTS ENGAGED IN ANIMAL AGRICULTURE RELATED CURRICULUM

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This paper was part of a larger study conducted by Texas AgriLife Extension Service to determine the attitudes, perceptions and knowledge of Animal Welfare and BQA principles of students involved in production agriculture, livestock producers and livestock market employees. Understanding these three groups’ animal welfare perceptions and attitudes will be invaluable in developing targeted and relevant curriculum for both Extension and traditional education venues.

This study focused on students engaged in the study of production animal agriculture as they are not only future consumers but also future agricultural professionals and livestock industry stakeholders.

To identify students’ overall perception of Animal Welfare in production agriculture, five constructs were developed. Each construct is an overall perception of a particular mindset within animal welfare and, as attitudes are composed of more than one factor, each construct is composed of several specific attributes of that mindset. The five constructs of animal welfare used in this study were: 1) production agriculture; 2) production methods; 3) animals in general; 4) attitudes toward animals in production agriculture and 5) production practices. In addition, students were surveyed to assess their basic knowledge of BQA practices.

Results indicated that overall students felt production agriculture was doing a good job as it relates to animal welfare, with favorable attitudes toward current production agriculture practices. Student responses to the BQA questions indicated a lack of knowledge of BQA principles. Because of this study, the College of Veterinary Medicine and the Department of Animal Science at Texas A&M University, the Department of Animal Science at Sam Houston State University and the Texas AgriLife Extension Service have collaborated to provide standardized instruction in BQA and low stress cattle handling to introductory level animal science and veterinary students. In addition, Texas and Southwestern Cattle Raisers and Texas AgriLife Extension will provide students completing the standardized program with certificates of completion. It is anticipated that the use of this research during curriculum design will enable instructors to more effectively address students’ perception of animal welfare in production agriculture, to produce a cadres of well-informed future agricultural professionals and livestock industry stakeholders.

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THE ONTARIO FARM-CALL SURVEILLANCE PROJECT (OFSP): ADVANTAGES OF AN ACTIVE SURVEILLANCE PROGRAM

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The Ontario Farm-call Surveillance Project (OFSP) is an Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) pilot project to investigate alternative methods to collect and monitor data on livestock disease in the province. The project began in April 2009 and currently has 29 clinics (118 veterinarians) participating across Ontario. One goal of the project is to use pre-diagnostic health data to rapidly detect an outbreak of disease. Participating veterinarians record the clinical signs they observe on farm calls and submit their data on a weekly basis. This information is analysed for geographic and temporal trends.

Other project goals include ensuring that data collection is easy, not time consuming and that participating veterinarians feel adequately compensated for the time they commit to data collection. Two options are available as compensation. The first option is that participating veterinarians may submit samples or carcasses to the Animal Health Laboratory (AHL), University of Guelph with all charges for the laboratory fees being accrued to the OFSP’s AHL account. The second option is the ability to charge OFSP a fee of $175 per farm call where an on-farm post mortem is completed by a veterinarian participating in the project.

The OFSP provides information in a timely manner for monitoring disease beyond that routinely available with laboratory submissions. The OFSP provides data for analysis of syndromic prevalence and geospatial distribution, has improved AHL reporting on public health risks and strengthens farm veterinary practice. OFSP also enhances the quantity and type of submissions to the AHL, effectively improving laboratory data for passive surveillance.
II. F. 2. 2011 USDA-ARS Animal Health Research Review

Novel Virus Discovery Using Megagenomics to Keep up with Current Challenges in Animal Health and Food Safety – M. Day

Evolving Translational Research to Keep the U.S. Free of Cattle Fever Ticks – B. Perez de Leon

Evolving Foot-and-Mouth Disease Virus Strains and Challenges for Vaccine Stockpiles – L. Rodriguez
NOVEL VIRUS DISCOVERY USING METAGENOMICS TO KEEP UP WITH CURRENT CHALLENGES IN ANIMAL HEALTH AND FOOD SAFETY

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USDA-ARS Southeast Poultry Research Laboratory

In order to characterize the un-described viruses present in the turkey gut, we utilized the Roche/454 Life Sciences GS-FLX pyrosequencing platform to compile an RNA virus metagenome from turkeys experiencing enteric disease. This approach yielded numerous sequences homologous to viruses in the nr protein database (GenBank), many of which have not been described in turkeys. The initial pyrosequencing runs were used to assemble 6526 contigs ranging in size from 97 to 2578bp. 4563 contigs produced no hits in the nr protein database. 724 contigs had similarity to sequences from cellular organisms, including bacteria, fungi and vertebrates. 788 contigs had similarity to RNA viral sequences, including sequences from the dsRNA viruses (Reoviridae and Picobirnaviruses), and the ssRNA viruses (Caliciviridae, Leviviridae, Picornavirales, and Astroviridae). The majority of the assigned viral contigs (620) showed similarity to database sequences from the Picornavirales order. These results validate this metagenomic approach to identifying known and novel RNA viruses in the poultry gut.

In order to directly confirm the presence of these novel picobirnaviruses (PBVs) in the poultry gut, an RT-PCR based assay targeting the PBV RNA-dependent RNA-polymerase (RdRp) was developed. This assay amplifies an 1135bp segment of the PBV RdRp. To validate this assay, primers were designed that incorporated a T7 promoter sequence in each primer; these primers were used to produce a cDNA sequence that could be used to generate in vitro dsRNA target sequences using the MEGAscript T7 RNA synthesis kit (Ambion). Serial dilution of the dsRNA was used to determine the sensitivity of the assay and RT-PCR with isolated RNA from known enteric viruses (avian revovirus, rotavirus and astrovirus) was used to determine potential cross-reactivity. The limit of detection of the assay was determined to be 7.4 x 10^4 molecules of target dsRNA. No cross-reactivity was seen with isolated enteric virus RNA or with total RNA extracted from control turkey intestinal homogenates. The sequence data generated via this approach will prove useful in a continuing, in-depth molecular characterization of the viral constituency of the poultry gut. This will facilitate the development of updated molecular diagnostic tests, plus a more thorough knowledge of the viral constituency in the poultry gut has the potential to provide the tools necessary to lead to a better understanding of the role viruses play in enteric disease and in the performance of poultry in general.

A similar approach utilizing the cloning of particle-associated nucleic acid (PAN) from the turkey gut identified a gut DNA sequence with similarity to
known phages within the family *Microviridae*. Using the original DNA contig, primers were designed to amplify the rest of the suspected ssDNA circular genome. The full genome of the putative phage was amplified and sequenced to reveal the full 5514bp sequence. The sequence of this novel phage was then compared to 14 other members of the Microviridae and was determined to encode proteins homologous to members of the Chlamydia phages and the *Bdellovibrio bacteriovorus* phage FMH2K. Ten putative open reading frames were identified in the complete genome, with only three exhibiting significant homology to known proteins in a BLAST analysis. Interestingly, the phage—now named phiCA82—contains a protein (p5) that contains a putative transmembrane domain similar to the transmembrane domain present in the phiX174 phage E lysis protein. This similarity raises the interesting possibility that this metagenomic approach—in addition to identifying novel enteric viruses in the poultry gut—can identify potential antibacterial peptides in the poultry gut that warrant further investigation. The PAN technique has also been used in our laboratory to identify and characterize the full genome sequence of novel chicken- and turkey-origin paroviruses. A DNA-based molecular diagnostic assay has been developed for these unique paroviruses, and they have been identified in numerous archived samples kept at SEPRL; chicken parovirus samples have been identified in samples from CA, NC, AR, MO, DE, and SC, while turkey parovirus samples have been identified in samples from NC, VA, MN, TX, and CA. Based upon the full genome sequence and phylogenetic analysis of the turkey and chicken paroviruses, these paroviruses have been placed in a proposed new genus within the *Parovirinae* subfamily, the *Avietal* genus, and are distinct from previously characterized goose paroviruses and adeno-associated viruses.
Cattle fever ticks and bovine babesiosis were the subject in the late 19th century of research efforts exemplifying what we call now the One Health concept. Animal, and human health are inextricably linked under that concept. Theobald Smith, a physician, and Frederick L. Kilborne, a veterinarian, formed the scientific team that in 1893 documented elegantly for the first time that pathogens can be transmitted by arthropods. Cooper Curtice, a veterinarian, contributed pioneering work on the life history of the ticks about that same time. Bovine babesiosis, also known as cattle tick fever, caused by the apicomplexan protozoa *Babesia bovis* and *B. bigemina* transmitted by the cattle fever ticks *Rhipicephalus* (*Boophilus*) *annulatus* and *R. (B.) microplus* had devastating health effects on livestock, and prevented the development of the cattle industry when these tick-borne protozoa and vectors were endemic in the U.S. Cattle fever ticks (CFT) and bovine babesiosis were officially declared eradicated from the U.S. in 1943 after a successful cooperative state-federal program that started in 1907. A permanent quarantine zone is maintained in south Texas to buffer CFT incursions from Mexico where the ticks are established. Major operational components of the CFT Eradication Program (CFTEP) include: surveillance, inspection, quarantine, compulsory dipping of cattle, and/or pasture vacation. Previous estimates adjusted to current values show that the U.S. livestock industry saves at least $3 billion annually by not having bovine babesiosis. Keeping the U.S. free of CFT is an agricultural biosecurity issue of national prominence. A major component of the USDA-ARS KBUSLIRL mission is to provide the CFTEP science-based solutions to keep the U.S. CFT-free in a sustainable manner. This contribution to the USDA-ARS Animal Health Research Review at the USAHA Annual Meeting provides an update on research conducted to meet needs identified during a public workshop held in 2009 where the One Health concept was applied to bovine and human babesioses. An ivermectin-medicated protein feed supplement block for cattle was tested as a free-access, passive, self-treatment technology at the Cattle Fever Tick Research Laboratory. Preliminary results indicate this would be a useful technology for the CFTEP. Efforts are underway to conduct pilot testing of this technology under field conditions. Stall tests revealed that an anti-tick vaccine based on the Bm86 antigen commercially available outside the U.S. was highly (>95%) efficacious against a Texas outbreak strain of *R. annulatus*. However, the level of efficacy reached against an outbreak strain of *R. microplus* was statistically insignificant. Our anti-tick vaccine discovery research program is addressing this technology gap. Our lab continued to contribute to the project funded by the National Institute for Food and Agriculture (project no.: TEXR-2009-05759) integrating
ecologically-based approaches to re-eradicate CFT from the U.S. Studies revealed that dynamic processes underlie visitation and access to field stations, established using the Thunder Valley Deer Feeder with ARS ‘2-Poster’ treatment adapter, by the white-tailed deer population. A correlation was found between the use of remote sensing technology to identify favorable white-tailed deer habitat and the ability to sample *R. microplus* larvae in the field. It is expected that outcomes from these research efforts will provide the basis for integrated strategies to mitigate the risk of CFT re-invasion so the national cattle herd remains free of bovine babesiosis. USDA is an equal opportunity provider and employer.
II.F.2. 2011 USDA-ARS ANIMAL HEALTH RESEARCH REVIEW

Evolving Foot-and-Mouth Disease Virus Strains and Challenges for Vaccine Stockpiles

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Foot and mouth disease (FMD) is a highly infectious and economically devastating disease of livestock species. Although vaccines, available since the early 1900s, have been instrumental in eradicating FMD from parts of the world, the disease still affects millions of animals around the globe and remains the main sanitary barrier to the commerce of animals and animal products. There are seven serotypes of FMD virus (FMDV) A, O, C, Asia 1, Sat 1, Sat 2 and Sat 3. There is no vaccine cross protection among the seven serotypes and even within certain subtypes within the same serotype (Grubman and Baxt, 2004). As a result, regional vaccines must be tailored to the strains that circulate in those regions. There are at least seven regional endemic “pools” where 6 of the 7 serotypes (serotype C has not circulated since 1995) and subtypes of FMDV circulate including East Asia (pool 1, A, O, Asia 1); South Asia (pool 2, A, O, Asia 1), Eurasia (pool 3, A, O, Asia 1); East Africa (pool 4, A, O Sat 1-3); West Africa (pool 5, A, O, Sat 1-2), South Africa (pool 6, Sat 1-3) and South America (pool 7 A, O) (Figure 1). From these endemic pools incursions occur into non-endemic regions that cause heavy economic losses. Recent virus incursions into previously free countries include Japan and Korea in 2010, in Japan the disease was eradicated by stamping out with limited vaccination and destruction of vaccinated animals and Korea opted to establish routine mass vaccination after failed attempts to stamping out the disease. Based on circulating strains, broad vaccine strain recommendations are made regularly by the FMD World Reference Laboratory (FMD-WRL). The most recent strain recommendations are listed in table 1. These broad recommendations do not always reflect the vaccine strains needs of specific countries and in some cases new strains emerge that require new vaccine strains. Two recent examples of new vaccine strains requirements include the emergence in 2009 of a new serotype O strain in Ecuador that is not properly covered by the recommended regional vaccine (O1Campos)(Maradei et al.) and the detection in Turkey of a new Asia 1 lineage not covered by the current Asia 1 Shamir vaccine.

Currently available inactivated antigen vaccines require the growth of large volumes of multiple serotypes and subtypes of virulent FMD virus (FMDV) that need to be adapted to grow in cultured cells and later inactivated, made devoid of non-structural viral proteins and kept at ultra-low temperatures for long-term storage. The formulated vaccine applied intramuscularly to individual animals, confers serotype and subtype specific protection in 1-2 weeks but fails to induce long-term protective immunity.
(past 6 months). Among the limitations of this vaccine are potential virus escape from the production facility, short shelf life of formulated product, short duration of immunity and requirement of dozens of antigens to address viral antigenic diversity (Rodriguez and Gay, 2011). Novel vaccine approaches such as the Adenovirus 5 – FMD vaccine currently under advanced development in the US (Pacheco et al., 2005) address some of these limitations such as safe production without the need of infectious virus but duration of immunity and cross protection are not solved with this vaccine platform. Remaining challenges will require a detailed understanding of FMDV interaction with its hosts including host and viral virulence determinants and immune responses. Basic research and the combination of reliable animal inoculation models, reverse genetics and computational biology tools will allow the rational design of safe and effective FMD vaccines. These vaccines should address not only the needs of FMD–free countries but also allow the progressive global control and eradication of this devastating disease.

Figure 1. Distribution of FMD outbreaks from 2005-2011 showing virus pools.
Table 1. Broad vaccine recommendations made by the FMD-WRL in 2010

<table>
<thead>
<tr>
<th>Pool 1</th>
<th>Pool 2</th>
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Further reading:
II. F. 3. One Health Rabies Symposium

Tackling the Global Impact of Rabies – D. Briggs

Bats, Rabies, and Emerging Paradigms – S. Recuenco

The Challenges of Preventing Rabies in A Shrinking World – L. Conti

Wildlife Rabies: Reservoirs, Surveillance & Control – D. Slate

The Evolving Wildlife Rabies Situation in Portions of the American Southwest – T. Sidwa

Terrestrial Rabies Control and Elimination Strategies in a Complex Residential Environment on Long Island (New York) – L. Bigler

REMI: A New Tool to Measure the Benefits of Rabies Prevention – S. Shwiff
Rabies has the highest case fatality rate of any disease known to infect humans. Once clinical signs are evident, death is virtually inevitable. Throughout the world, rabid dogs cause more than 99% of all human deaths, 60% of which are children under the age of 15. Most of these deaths occur in Africa and Asia. Additionally, canine rabies has caused the regional extinction of rare animal species like the African wild dog and continues to threaten the rare Ethiopian Wolf population. The current human rabies vaccines recommended by the World Health Organization are among the most efficacious vaccines in the world and when administered even after an exposure to rabies occurs, can effectively save human lives. Yet, in spite of excellent vaccines, one human dies of rabies somewhere in the world every eight minutes. The reason these deaths occur is most often due to bite victims not seeking life-saving vaccines or because they must delay receiving vaccines until they sell valuable livestock in order to raise enough money to pay for the biologicals or they must travel long distances to find vaccines. Cost-effective models have proven that the most effective and beneficial strategy to reduce the number of global human rabies deaths is to eliminate rabies at the most common source of infection, in the dog population. Additionally, by eliminating the circulation of rabies in the free-roaming dog population of Africa, Asia, and Latin America, the threat of this disease to wildlife would also be eliminated.

To reduce and even eliminate rabies in the dog population, it will be necessary to utilize an intersectoral or One Health approach. Several projects supported by the Global Alliance for Rabies Control have successfully utilized a One Health intersectoral approach to prevent and control canine rabies. For example, in the province of Bohol Philippines, a collaborative project with the governor managed to eliminate dog rabies within four years. The project included: a mass information and educational campaign aimed at the general population; the development of teaching modules that integrated rabies education into the elementary school curriculum; the vaccination and registration of 70% of the dog population; the enforcement of existing rabies control laws; and the involvement of more than 15,000 community volunteers.
Bat rabies is enzootic in the USA. Almost all human rabies cases in the last decade are associated with bats. Bat exposures are an important source of concern to the public. In the USA, incidents in which humans come in contact with bats are frequent but mass exposures are rare. In Latin America, vampire bat rabies causes human outbreaks regularly, mainly in the Amazon. In the rest of the world, several lyssaviruses have been identified in bats, and for some of these cross reactivity with current biologics is less than ideal. With an increase in international travel and alteration of natural habitats, contacts between bats and humans may be more frequent. Control strategies targeted for canine rabies are not effective or feasible to control rabies among bat populations. Human rabies prevention, such as post-exposure prophylaxis and educational outreach are the primary strategies used to minimize the public health issues surrounding bat rabies. Nevertheless, bat rabies cases in the Americas are not declining. The impact of bat-human interactions should be evaluated and addressed with new paradigms that consider options such as reduction of health disparity, pre-exposure vaccination of populations at risk, and developing environmentally acceptable methods for bat rabies control within a renewed One Health approach.
RABIES PREVENTION AND CONTROL: OH, THOSE 5PM FRIDAY
STATE HEALTH OFFICE CALLS

Lisa Conti
Florida Department of Health

Abstract: Public Health officials must use investigative skills, clinical acumen and the available science to manage rabies. This is critical in protecting people from disease after potential virus exposure, as well as preventing disease spread among animals. As a classic One Health issue, rabies prevention and control continues to stretch the imagination of exposure scenarios. This presentation includes a series of selected calls posed to the Florida State Health Office for rabies consultation.
Since raccoon rabies rapidly spread from the mid-Atlantic epizootic focus, raccoons have been the most frequently reported species with rabies in the U.S. In 2010, raccoons accounted for 36 percent (n=2,246) of reported cases to the Centers for Disease Control and Prevention (CDC). For the past several years, rabies in skunks has ranked either number two or three, behind bats, followed by rabies reported in foxes. Since the mid-1990’s, Wildlife Services has been involved with wildlife rabies control where coordinated oral rabies vaccination (ORV) is the central tactic. The program’s underlying philosophy continues to be in the spirit of “One Health” to bring together multiple disciplines from municipal, county, state, federal and international agencies; universities; and the private sector to better ensure collaborative, science-based approaches to rabies management in wild carnivores. Currently, Wildlife Services (WS) provides leadership in the coordination of ORV activities among several states committed to preventing raccoon rabies from spreading to new areas west and north of its current distribution, while exploring eliminations strategies. In addition, WS cooperates with Texas, New Mexico and Arizona in coordinated ORV or TVR activities targeting rabies control in gray foxes, coyotes and skunks. From 2005 to date, enhanced surveillance has become a critical program component as a complement to public health surveillance to improve rabies management decision making. During that period, 62,168 suspect animals have been tested, with 897 confirmed rabid; of these, 48,605 samples were diagnosed through the direct rapid immunohistochemistry test. The focus of this presentation will be on raccoon rabies accomplishments and future initiatives to move toward elimination. North American Rabies Management Planning research initiatives and surveillance and control challenges along our mutual borders with Canada and Mexico will be discussed, along with other program opportunities and challenges.
II.F.3. ONE HEALTH RABIES SYMPOSIUM

THE EVOLVING WILDLIFE RABIES SITUATION IN PORTIONS OF THE AMERICAN SOUTHWEST

Tom Sidwa
Texas Department of State Health Services

The epidemiology of rabies in the U.S. is dynamic due to the influence of such factors as natural and anthropogenic variables and evolution of the virus itself. Bat variants in the U.S. are thought to pre-date the arrival of Europeans while canine variant introduction was associated with European colonization. The fox variants that now exist in Arizona, New Mexico, and Texas likely arose from the canine virus as did the domestic dog/coyote (DDC) variant that was declared in 2007 to have been eliminated from the US. The south-central skunk variant and the rabies virus variant found in and around Flagstaff, Arizona, are thought to represent bat variant adoption of carnivores as reservoir species.

Over the last century, rabies in the U.S. has transitioned from the domestic dog to wildlife as the predominant reservoir. Prior to 1960, the majority of rabies cases were in domestic animals. With the advent of rabies vaccine for domestic animals and implementation of effective animal control programs, more than 90% of animal rabies cases reported in the U.S. are now predictably in wildlife species.

The ultimate elimination of terrestrial wildlife rabies epizootics was not considered achievable until the advent of oral rabies vaccine in species-appropriate bait. The recombinant vaccinia-based oral rabies vaccine that is in use today in the US was used by the Texas Department of State Health Services in partnership with USDA-APHIS-Wildlife Services to eliminate DDC variant from south Texas and, by extension, the US. The same vaccine has resulted in control of Texas fox (TF) rabies variant and the near-term prospect of eliminating that variant from the US. Use of this tool has also been employed in the area of Flagstaff, Arizona, to control an epizootic of rabies in foxes. Other vaccine options are being investigated that will hopefully allow oral rabies vaccine to yield reliable results in addressing skunk rabies variants throughout their ranges.

Recent migration of Arizona fox (AF) variant into southwestern New Mexico raised concern that AF variant could migrate into Texas and undermine the success of the TF program. Moreover, AF variant and DDC variant continue to exist in Nuevo Leon, a Mexican state bordering Texas. This, coupled with the species jump from bats to skunks and foxes in Arizona, makes clear that rabies virus and its epidemiology will continue to evolve and that dealing with rabies in terrestrial wildlife continues to require solid surveillance programs; research targeting the virus, its reservoirs, and their interactions; oral vaccine and bait development; and strategic planning with tactical flexibility.
When compared to rural areas, wildlife rabies control efforts in urban/suburban environments are fraught with operational challenges including exceedingly high human and domestic animal populations, elevated raccoon densities, fragmented habitats, limited access to both exclusive and diminutive private properties, extensive aerial and vehicle travel impediments, and numerous, independent, small jurisdictional areas and managers. Fixed-wing aircraft are also not suitable for urban vaccine deployment because bait distribution parameters must be controlled to avoid dense housing and an abundance of vehicles. Accordingly, alternative vaccine distribution methods (i.e., helicopter, vehicle and bait station) and varying bait densities were evaluated within two challenging urban/suburban counties with a human population of approximately 2.9 million people.

Wildlife rabies control efforts using the RABORAL V-RG® vaccine contained in the fishmeal polymer bait were initiated on Long Island at the start of the terrestrial rabies epizootic during 2004. In total, 86 of 3217 raccoons were confirmed rabid in the treatment area between 2004 and 2009. Thus far, the intervention appears successful; the leading edge of the epizootic front has not advanced eastward since 2006. All positive diagnoses have been restricted to raccoons; rabies spillover has not been reported in any other wild or domestic species. The last terrestrial rabies case was diagnosed during January 2009, with an additional 951 raccoons confirmed negative through 18 August 2011. Skunks, a potential confounder of ORV success in other areas of the United States and Canada, have not been live-captured or observed in the Long Island vaccination area.

Initially, the NYS Department of Health and USDA Wildlife Services implemented population reduction, trap-vaccinate-release, and oral rabies vaccination (ORV) with target bait densities of 125 and 150 baits/km². The bait density was increased to 250 baits/km² during 2006 in response to continuing cases across the entire enzootic zone, as well as a continually-advancing epizootic front. Cornell University initiated the evaluation of applications of 500 baits/km² over the epizootic front during 2007, while a bait density of 250 baits/km² was maintained over enzootic and pre-epizootic areas during subsequent years. Raccoon age, treatment method, achieved bait density, and human population density had significant effects on the probability of raccoon seroconversion at the 0.125 IU cutoff value. Increasing the bait density resulted in a greater probability of seroconversion. As the human population density increased, the probability of raccoon seroconversion decreased. Bait-station distribution was comparable to vehicle distribution, while parallel and grid flight lines effected statistically
greater levels of seroconversion. Finally, adult raccoons were marginally more likely to seroconvert, when compared to juvenile animals. The probability of raccoon seroconversion was not significantly influenced by land use/land cover, month of bait distribution, raccoon sex, or landowner parcel area.

The number of baits that were completely chewed (i.e., punctured vaccine chambers) or removed from bait station locations were monitored during 2006 and 2007. Bait success was positively associated with distance from road, with significantly greater bait success as station distance from roads increased. Conversely, a negative response was associated with distance from water; bait consumption/removal decreased significantly as station distance from water increased. When compared to open-developed space, significantly fewer baits were removed from low and medium-intensity housing districts. Station placement in forested habitats resulted in the removal of a greater number of baits; however, bait success in forested habitat was not significantly different from open-developed space. An evaluation of seroconversion relative to distance from bait station locations demonstrated that raccoons captured in close proximity to bait stations were statistically more likely to seroconvert.

Thus far, the ORV intervention appears successful on Long Island, albeit with elevated bait and aerial distribution parameters that may not be sustainable over large contiguous areas of the US. A stringent economical analysis will be necessary to determine if a routine bait density of 250 baits/km² over enzootic and pre-epizootic areas, concomitant with applications of 500 baits/km² over the leading edge of the epizootic front during 2007-2009, proved cost-effective in comparison to persisting rabies infection across the entire extent of the heavily-populated, Long Island landscape.
Raccoons are the most frequently reported rabid wildlife species in the US, accounting for nearly 35% of all animal cases. After the translocation of infected raccoons from the Southeast to West Virginia in the 1970’s, the disease spread rapidly and is now enzootic throughout much of the eastern United States. In 1997, Wildlife Services and cooperators began an extensive oral rabies vaccination program to limit the westward spread of raccoon rabies. The ORV program has established and maintained a zone of immunity that extends from Ohio, Pennsylvania, and New York and continues south to the Gulf Coast in Alabama. The benefits of preventing the westward spread of raccoon rabies include a reduction in the needs for human post-exposure prophylaxis, animal testing for rabies, pet vaccination, livestock vaccination or indemnification. A more complete economic assessment of the impact of raccoon rabies is possible through the use of sophisticated input-output (IO) models that provide estimates of the total economic impact to the US economy. This presentation will provide results of a study that used the REMI model from Regional Economic Models Inc. to estimate the economic impacts of raccoon rabies as it currently exists, as well the potential impacts of its spread in absence or the ORV-created zone of immunity. Results will be presented in terms of regional impacts on employment and business revenue and income.
III. Organizational Matters

A. Bylaws of USAHA
B. USAHA Administrative Policies
C. Previous Meetings
D. USAHA Medal of Distinction Award
II. A. BYLAWS OF THE UNITED STATES ANIMAL HEALTH ASSOCIATION
APPROVED 2007

ARTICLE I – NAME

The name of this Association shall be “The United States Animal Health Association.”

ARTICLE II – PURPOSE

The United States Animal Health Association is a forum for communication and coordination among State and Federal governments, universities, industry, and other concerned groups for consideration of issues of animal health and disease control, animal welfare, food safety and public health. It is a clearinghouse for new information and methods, which may be incorporated into laws, regulations, policy, and programs. It develops solutions of animal health-related issues based on science, new information and methods, public policy, risk/benefit analysis and the ability to develop a consensus for changing laws, regulations, policies, and programs.

ARTICLE III – MEMBERS

3.1. Classes of Members. The classes of members are: Official Agency Members; Allied Organization Members; Individual Members; Student Members; Elected Regional Delegate Members; International Members; Life Members; and, Honorary Members.

a. Official Agency Member. The animal health department or agency of each state, U. S. territory or commonwealth, and the District of Columbia; the animal health department of the United States of America; and such other governmental departments or agencies as the Board of Directors may, by a two-thirds majority vote, approve.

b. Allied Organization Member. Any non-profit organization that is national in scope and actively and directly concerned with and supportive of the interests and objectives of the Association as outlined in Article II-Purpose, may become a member upon approval of the Board of Directors by a two-thirds majority vote.

c. Individual Member. Any person engaged in work related to animal production, animal health, food safety, public health, veterinary medicine and animal research and who supports the interests and
III. A. BYLAWS OF USAHA

objectives of the Association as outlined in Article II-Purpose, may become a member upon approval of the Executive Committee by a majority vote.

d. **Elected Regional Delegate Member.** Such elected regional delegates as provided for in Article VI-Board of Directors shall by virtue of such election automatically become members of the Association and shall serve from the close of the annual meeting following their election to the close of the following annual meeting and shall pay dues as the Board of Directors may determine.

e. **Student Member.** Any person enrolled in the study of animal production, animal health, food safety, public health, veterinary medicine, and animal health research who supports the interests and objectives of the Association as outlined in Article II-Purpose is eligible to become a member of the Association. Student members may take part in the open proceedings and meetings of the Association but shall not hold voting privileges as provided in 3.2.

f. **International Member.** The chief official agency member from any foreign federal animal health, food safety, public health and animal health research agency or department, and any foreign national animal industry organization or person who supports the interests and objectives of the Association as outlined in Article II-Purpose, or said person’s designee, is eligible to become a member of the Association upon approval of the Board of Directors by a two-thirds majority. International Members may take part in the open proceedings and meetings of the Association but shall not hold voting privileges as provided in 3.2. However, the Association recognizes that Australia, Canada, Mexico and New Zealand are voting members and shall continue to remain full voting members after the adoption of these bylaws. New International Members shall obtain voting rights only by amendment of the bylaws.

g. **Life Member.** Any individual member who has maintained membership in the Association for 35 years, or if such member is at the point of retirement, for 25 years, is eligible to be a life member. Past Presidents of the Association are deemed to be life members. Life members shall have all the privileges of regular membership and shall be exempted from payment of all dues. Election to Life Membership of individual members shall be by a majority vote of the Board of Directors. Life Members shall be exempt from the payment of one-half of annual meeting registration fees; provided that retired
past presidents who receive no remuneration for expenses incurred while in attendance are fully exempt from the payment of annual meeting registration fees.

**h. Honorary Member.** Any person not otherwise a member of the Association who has contributed materially to the advancement of animal science, food safety, public health, veterinary medicine, animal research, or the purposes of the Association, may be nominated by the Executive Committee for Honorary Membership. Honorary Membership shall be conferred by a majority vote of the Board of Directors. Honorary Members shall be exempt from the payment of all dues and shall not have voting privileges as provided in 3.2.

3.2. **Voting.** Each member shall have one vote, unless otherwise provided in these By-Laws.

a. **By State and Federal Official Agency Members and Allied Organization Members.** The director or chief executive officer of each Official Agency Member and Allied Organization Member shall appoint and certify in writing to the Executive Director of the Association a person to be its representative who shall represent, vote, and act for each of these classifications of member in all the affairs of the USAHA, until further notification.

3.3. **Dues.** The Board of Directors at any annual meeting shall have the power to determine the amount of dues.

a. **Non-payment of Dues.** Subject to any policy the Board of Directors may establish for reinstatement, failure to pay dues within 90 days of notice of delinquency shall result in automatic termination of membership.

b. **Voluntary Withdrawal of Membership.** A member may voluntarily terminate membership effective upon submission of notice of withdrawal to the Association but shall not be entitled to a refund of any dues paid.

3.4. **Effective Date of Membership.** Membership shall become effective upon submission of written application in the form required, satisfaction of eligibility requirements, election to membership by an appropriate vote of the Executive Committee, and payment of annual dues.
3.5. **Suspension or Expulsion.** For cause, and upon reasonable notice setting forth the specific reasons therefore any member may be suspended or terminated. Sufficient cause for such suspension or termination of membership shall be violation of these bylaws or any lawful rule or practice duly adopted by this Association, or any other conduct prejudicial to its interests. Suspension or expulsion shall be by two-thirds vote of the entire membership of the Board of Directors.

**ARTICLE IV – MEETINGS**

4.1. **Annual.** There shall be an annual meeting between September 15 and November 15 for receiving annual reports and the transaction of other business.

   a. **Notice Requirements.** Written notice setting forth the Agenda and location of the annual meeting shall be mailed or transmitted electronically to all members at least 60 days prior to the first day of such meeting.

   b. **Annual Meeting Location.** The location of the annual meeting shall be selected by the Regional Districts on the following rotational basis: North Central, Northeast, Western, and Southern; and with the concurrence of the state animal health official of the state in which the meeting is to be held. The location and site shall be finally selected in accordance with guidelines proposed by the Executive Director and approved by the Executive Committee. The Board of Directors shall be advised of the selected meeting location at least five years in advance of the meeting. In the event that any annual meeting location becomes unavailable and/or unacceptable the Executive Committee is authorized to select an alternate location.

   c. **Closure.** The annual meeting shall be considered officially closed upon the completion of the Board of Directors’ meeting held on the last day of the annual meeting.

4.2. **Special.** Special meetings may be called by the President, in consultation with the Executive Committee, or by a majority of the Board of Directors. Notice of any special meeting shall be mailed, published in the Association newsletter and/or transmitted electronically to the membership with a statement of time and place and information as to the subject(s) to be considered at least 30 days prior to the date of the meeting. Emergency situations shall be dealt with by the Executive Director with the approval of
the Executive Committee who shall provide as much notice to the Board of Directors as may be practical under the circumstances.

4.3. Committee and General Membership Meetings. Unless otherwise specifically set forth in these bylaws, all committee and general membership actions require a majority vote provided a quorum of the voting membership is present.

4.4 Quorum. A quorum of the Executive Committee shall consist of two-thirds of its membership. A quorum of the Board of Directors shall consist of thirty (30) or more members, providing that a majority of those in attendance is comprised of Official Agency Members. A quorum of all other committees shall be ten (10) voting members or thirty percent (30%) of the committee membership, whichever is less. A quorum of the general membership shall consist of thirty (30) or more members.

4.5 Proxy Voting. Proxy voting (the power of attorney given by one person to another to vote in his or her stead) is not permitted in any meeting.

ARTICLE V – OFFICERS AND EMPLOYEES

Section 5.1. Elected Officers. The elected officers of the Association shall be a President, President-Elect, First Vice-President, Second Vice-President, Third Vice-President, and Treasurer. They shall be voting members in good standing of the Association.

a. President. The President is the chief officer of the Association and shall preside at the annual meeting and all meetings of the Executive Committee and perform such other duties as customarily belong to that office or which the Board of Directors or Executive Committee from time to time may assign. The president is an ex-officio member of all Committees and may designate an appropriately qualified member as his designee to attend any committee meetings of the Association in his place and stead.

b. President-Elect. The President-Elect shall act in place of the President in the event of his/her absence, death, or inability to act. When so acting the President-Elect shall have all the powers of and be subject to all restrictions upon the President. Specifically he/she shall be the chairman of all meetings of the Board of Directors. He/she shall perform such other duties as the President, Board of Directors or Executive Committee from time to time may assign. The
President-Elect shall automatically become President upon election at the close of the annual meeting.

c. **First Vice-President.** The First Vice-President shall act in place of the President Elect in the event of his/her absence, death or inability to act; and shall perform such other duties as the President, Board of Directors or Executive Committee may assign.

d. **Second Vice-President.** The Second Vice-President shall act in place of the First Vice-President in the event of his/her absence, death or inability to act; and shall perform such duties as the President, Board of Directors or Executive Committee may assign.

e. **Third Vice-President.** The Third Vice-President shall take the place of the Second Vice-President in the event of his/her absence, death, or inability to act; and shall perform such duties as the President, Board of Directors or Executive Committee may assign.

f. **Treasurer.** The Treasurer shall be the chief financial officer of the Association, shall be chairman of the Audit Committee and perform those duties that are delegated to the office by the Board of Directors and the Executive Committee. The treasurer shall not be responsible for the day-to-day financial transactions of the Association, which will be assumed by the Executive Director.

**g. Election.**

1) The Committee on Nominations and Resolutions shall annually report its recommendations for the offices of President, President-Elect, First Vice-President, Second Vice-President, Third Vice-President, Treasurer and Regional Delegates to the Association membership at the first business session.

2) The District from which the President originated shall submit a nominee for the office of Third Vice President.

3) Should vacancy(ies) occur before the next annual meeting, the District(s) from which the officer(s) vacated shall submit a nominee for the office of Second Vice President (if two vacancies occur a First Vice President will also need to be nominated).
III. A. BYLAWS OF USAHA

4) Nominees for Regional Delegates from the Districts shall be selected by the individual districts and supplied in a timely fashion to the Committee on Nominations and Resolutions for inclusion in its report.

a. 5) The Committee on Nominations report will be presented during the first business session. The committee report shall be posted on the registration bulletin board immediately following its presentation at the first business session. The report shall be read again during the second business session at a time certain specified in the program for “Report of Action of the Committee on Nominations and Resolutions.” If a paper is being presented at the specified time, the presentation will be completed and, immediately after, the report shall be read. If the program is ahead of schedule, a recess will be taken until the time specified in the program for the amendments to the slate presented by the Committee.

5) The report or amendments approved by a majority vote of the membership is forwarded to the Board of Directors. The acceptance of the report by a majority vote of the Board of Directors shall constitute election of the nominees to office.

h. Term. The officers shall serve for one year or until their successors are elected and qualify.

5.2. Executive Director. The Executive Director shall be employed by and serve at the pleasure of the Executive Committee, manage the Association’s day-to-day affairs and perform such other duties as customarily belong to that office or as the Board of Directors or Executive Committee may assign. The Executive Committee shall prepare and negotiate a contract with the Executive Director for a period of not more than five (5) years which shall be subject to approval by a majority of the Board of Directors. If the Association does not have an Executive Director, the Board of Directors shall elect a Secretary.

ARTICLE VI – BOARD OF DIRECTORS

6.1. Board of Directors. The Board of Directors shall have authority over all matters of the Association within the limits of the bylaws.
6.2 **Composition.** The Board of Directors shall be composed of the following:

- **a.** The Official Agency Members or their designees
- **b.** One representative selected by each of the Allied Organization Members
- **c.** Two delegates-at-large from each of the four regional districts
- **d.** Past presidents of the Association
- **e.** The International Member who is the chief animal health executive officer representing the principal federal animal health department of Canada, Mexico, Australia and New Zealand, or said person’s designee.
- **f.** Members of the Executive Committee

6.3 **Meetings.** The Board of Directors shall have a regular meeting at the time and place of the annual meeting, and shall meet at such other times and places selected by the President or by request of a majority of the directors, in which latter event, the President shall promptly set the time and place of the meeting. Notice of all meetings of the Board of Directors shall be mailed, published in the Association newsletter or transmitted electronically at least thirty days in advance of such meetings. The President, on such reasonable notice as may be practicable under the circumstances, may call emergency meetings of the Board of Directors. At any meeting of the Board of Directors, the President Elect (Chairman of the Board of Directors), with a majority vote of the Board of Directors, may call for an Executive Session limiting attendance.

6.4 **Duties.** The Board of Directors shall: receive all committee reports and accept or reject all or part of them; review and approve or disapprove with comment the actions of the Executive Committee; and perform such other functions set forth in the By-Laws of the Association.

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**ARTICLE VII – EXECUTIVE COMMITTEE**

7.1 **Executive Committee.** The Association shall have an Executive Committee composed of the elected officers and the immediate Past President of the Association. In addition the Executive Director shall serve as an ex officio, non-voting member of the Executive Committee and shall not be counted for the purpose of determining a quorum.

7.2 **Duties.** The Executive Committee shall manage the financial, administrative and internal affairs of the Association when the Board of Directors is not in session. To exercise the authority of the Board of Directors.
Directors, the Executive Committee must act as a whole, and must forthwith submit its action for approval at the next meeting of the Board of Directors.

7.3. Meetings. The Executive Committee shall meet at least four times each fiscal year at such time and place and upon such notice as the President determines. The Executive Committee is authorized to take action upon the concurring votes of a majority of its total membership, provided that a quorum is present.

7.4. Emergency Meetings. Should the President determine that an emergency situation exists, the President may convene a telephone or other type of electronic conference meeting of the Executive Committee, which may then act provided a quorum participates.

ARTICLE VIII – ORGANIZATIONAL DISTRICTS

8.1. Districts. The Association shall be organized into five districts composed of the Northeast Regional District, the North Central Regional District, the Southern Regional District, the Western Regional District and the District-At-Large.


b. The North Central Regional District consists of Association members of the states of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

c. The Southern Regional District consists of Association members of the states of Alabama, Arkansas, Georgia, Florida, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and the Virgin Islands and Puerto Rico.

d. The Western Regional District consists of Association members of the states of Alaska, Arizona, California, Colorado, Hawaii, Idaho,
III. A. BYLAWS OF USAHA

Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

e. The District-At-Large shall be composed of the Allied Organization Members and the Elected Regional Delegate Members and Past Presidents.

ARTICLE IX – STANDING AND SPECIAL COMMITTEES

9.1. General. The President shall annually appoint from the members of the Association such standing or special committees or subcommittees and their chairpersons as may be required by the bylaws or as he/she may find necessary. Each committee shall meet at least once per year at the time of the annual meetings of the Association, and at such other times as the President of the Association and committee Chairman deem necessary to accomplish the work of the Committee. Only members of the Association permitted by these by-laws are permitted to vote on the work of the committee.

9.2. Program Committee. A program committee shall be appointed by the President and shall consist of the chairpersons of all committees and the elected officers of the Association to develop the programs for the annual and any special meetings of the Association with the goal of furthering the purposes of the Association. The Program Committee shall be chaired by the President-Elect and co-chaired by the First Vice-President.

9.3. Committee on Nominations and Resolutions. The Committee on Nominations and Resolutions shall be comprised of the living past presidents of the Association, the Presidents of the Northeast, North Central, Southern and Western Regional Districts, and the President of the District-At-Large.

a. Chairman. The immediate past President of the Association shall chair this committee.

b. Nomination of Elected Officers. This Committee shall receive, consider and recommend to the Association’s membership at the annual meeting nominations for the elected officers specified in 5.1 and delegates from each district as specified in 6.2.c. The recommendation of elected officers and delegates from each district shall be submitted no later than the third day of September next preceding the annual meeting at which the election will be held.
c. **Resolutions.** This committee shall review all resolutions of the standing and special committees (the Executive Committee and Board of Directors are standing Committees) for ambiguities and redundancy, but shall not alter their intent. After this review, this committee shall present the resolutions to the general membership for approval, which shall require a majority vote.

9.4. **Audit Committee.** The Audit Committee shall receive the annual audit report, and confirm that all financial affairs of the Association are in order and make such recommendations to the Board of Directors as may be necessary to ensure the proper management of the finances of the Association.

9.5. **Special Committees.** The President with the advice of the Executive Committee shall appoint the chairman and members of such other committees as are necessary to accomplish the purposes of the Association.

**ARTICLE X – MISCELLANEOUS**

10.1. **Amendments.**

a. These bylaws may be amended by: (1) Specific proposed amendment(s) being presented in writing to the Executive Committee for review. The Executive Committee shall then provide their recommendations on the proposed amendments to the Board of Directors for deliberation and action;(2) If preliminarily approved by majority vote of the Board of Directors, the proposed amendment(s) shall then be presented to the membership; by publication in the next annual meeting proceedings; (3) The proposed amendment(s) shall then be presented to the membership at the next annual meeting.

b. Amendments to bylaws shall be presented section-by-section at a meeting of the members and shall be approved only upon an affirmative vote of two-thirds of the voting members, provided a quorum is present.

c. In the event the amendment(s) proposed are not approved by the Board of Directors as set forth in (1), then the proposed amendment(s) may be presented by a petition signed by at least thirty members which shall result in their proceeding through steps (2) and (3) above as if the Board of Directors had initially approved the proposed amendment(s).
10.2. Fiscal Year. The Executive Committee shall from time to time establish the Association’s fiscal year.

10.3. Parliamentary Procedure. Robert’s Rules of Order Newly Revised shall govern the proceedings of the Association, the Board of Directors and all committees in all cases not otherwise provided for in applicable federal or state statute or rule, the articles of incorporation or bylaws of the Association or its policies or procedures.

10.4. Confidential Information. Confidential information of the Association shall be maintained in confidence and not used for any other than Association purposes nor disclosed to others, except as permitted by law, these bylaws or written consent of the Association, by Association members, directors, officers, employees and agents.

10.5. Liability of Officers and Directors. The officers and directors of the Association shall not be personally liable for the debts or actions of the Association.

10.6. Annual Audit. The Association shall cause an independent certified public accountant, selected by the Executive Committee, to make an annual examination of its financial accounts and shall submit the report of examination to Audit Committee.

10.7. Compensation/Reimbursement. No member of the Board of Directors, committee member or elected officer of the Association shall receive any compensation for his or her services as such. The Association shall develop policies providing for reimbursement of expenses reasonably incurred in attending meetings and performing special assignments of the Association by the elected officers.

10.8. Dissolution. In the event of dissolution, the Association shall distribute its assets as required by the laws and statutes of the State of Delaware; and distribute its remaining net assets in a manner permitted an entity to maintain its status as exempt from taxation under Section 501 (c) (5) of the Internal Revenue Code of 1986, as amended, or any successor provision.
III. B. USAHA ADMINISTRATIVE POLICIES

ESTABLISHMENT AND OPERATION OF STANDING COMMITTEES
2006

1. All members of standing committees must be official members of USAHA in good standing in accordance with Section 3.4 of the bylaws.

2. The Chair, Vice Chair, and all members of USAHA Committees shall be appointed by the President. It is expected that member appointments will be made in consultation with Committee Chair.

3. Efforts should be made to keep committee size to a manageable number of members, and to maintain a geographical balance, as well as an appropriate balance of State, federal, industry and technical members.

4. Committee Chairs shall be appointed for term of not more than five years, and should not be reappointed Chair for at least one year.

5. All USAHA members present at committee meetings may enter into discussions. Only committee members may introduce resolutions or vote on items of business.

6. Committees shall submit reports only to the Board of Directors and Resolutions only to the Committee on Nominations and Resolution. Committee reports are not considered official actions until approved by the Board of Directors. Committee resolutions are not considered official actions of USAHA until approved by the general membership.

7. Committee Chairs may appoint subcommittees as necessary. Subcommittee members must be members of the parent committee. Subcommittees shall deliberate only the subject matter(s) delegated to them by the parent committee and shall report only to the parent committee.

8. Committee rosters for the current year should be finalized no later than 30 days prior to the start of the Annual Meeting.

PARTICIPATION IN USAHA OF FEDERAL AGENCIES AND FEDERAL EMPLOYEES
2009

Federal agencies and personnel have long been an integral and valuable part of USAHA. Agencies have taken part in the organization through official membership and representation on the Board of Directors. This provides the opportunity for presenting agency positions and concerns to the Association. Individual membership and participation of numerous animal health, food safety, and research professionals from a variety of federal agencies is critical to the committees’ success.

A major function of USAHA is development of policies and procedures of national disease control and eradication programs. This means that many
committee findings and resolutions constitute recommendations to the appropriate federal agency which is responsible for the area of concern. Some of these recommendations are contrary to agency policy or position. For this reason, federal employees should actively share their expertise and opinions as committee members, but should not serve as chairs where they would be making recommendations to their employer.

A number of committees have used federal employees as assistant chairs to good advantage. Also, committees which do not deal with federal agency policy may be chaired by federally-employed USAHA members where appropriate.

The Executive Committee is responsible for the daily activities of the Association, and represents the Association on a year-round basis. To avoid conflict of interest, federal employees should not serve in elected officer positions of the Association. Individuals that serve as an officer that become employed by the federal government should resign their officer position, and a replacement should be sought in accordance with the bylaws.

FINANCIAL AND INVESTMENT POLICY

The following policy outlines the administrative principles of the United States Animal Health Association reserve funds.

Goals

1. Build and maintain two year’s operation expenses in reserves.
2. Maintain adequate liquidity in the instance funds must be called for use.
3. Earn reasonable interest on reserves to maintain principle and exceed economic inflation rates.

Delegation of Authority

Both Treasurer and Executive Director should be designated as signors on any USAHA accounts. At this time, USAHA will not employ a third-party account manager to manage investments. However, USAHA may utilize the services of a brokerage manager for locating investment opportunities and advice.

Responsibilities

- Treasurer: Primary authority for investment decisions, acting within parameters of investment policy. Responsible for monthly review of financials and chairing audit committee.
- Executive Director: Manager of investments, to act under direction of Treasurer. Provide research, recommendations to Treasurer for decisions. Responsibility for day-to-day bookkeeping and reporting (to Treasurer/Executive Committee) of financial information. Compile and distribute quarterly investment reports to EC.
III. B. USAHA ADMINISTRATIVE POLICIES

- Executive Committee: Provide regular review of investments from quarterly reports. Provide oversight of Treasurer and Executive Director decisions.
- Board of Directors: Provide approval and/or amendments to investment policy for execution.

Asset Management

USAHA shall put at risk no principle of its reserve funds or operating funds. Investments will be held in secured, FDIC insured institutions. Investments should be less than $100,000 in any single financial institution whenever possible.

All cash received will be deposited into the checking account. To the extent possible, the checking account balance should not exceed $100,000 at the end of each monthly reporting period. Reserve funds shall be invested in Certificates of Deposit, Money Market, Treasury Bills or Treasury Notes as determined by the Treasurer. The following guidelines will assist in determining terms to allow reasonable liquidity should the reserves be needed.

- Maximum of 25% of Reserve Funds in products of greater than 4 years.
- Maximum of 25% of Reserve Funds in products of 24 months to 4 years.
- Minimum of 40% of Reserve Fund in products less than 24 months.
- Minimum of 10% of Reserve funds in money market savings account for immediate liquidity.

USAHA shall make efforts to ladder CD maturity dates so that at least $50,000 comes due in each fiscal quarter.

This policy will be reviewed annually by the Executive Committee, with any amendments to be brought before the Board of Directors.

Reserve Fund Balance (2010)

USAHA targets a financial reserves balance equal to two years of operating expenses. The Treasurer and Executive Director are responsible for monitoring this status, and reporting accordingly to the Executive Committee.

Should the reserve balance drop below the target amount, the following criteria should take place:

85-99% of Target Balance

The Executive Committee shall make appropriate budget adjustments to increase funds to target amount within one year, or an appropriate timeframe according to current economic conditions.

50% - 84% of Target Balance

The Executive Committee shall make appropriate financial cuts and budget adjustments to increase funds to target amount within three years, or a more appropriate timeframe according to current economic conditions.

Less than 50%
The Executive Committee shall undertake a major financial overhaul of the organization and develop a plan to: 1) operate in a sustainable manner and 2) rebuild the reserve funds to the target area. Adjustments should be made immediately upon Executive Committee approval of the new plan, with modifications subject to Board of Directors at the next annual meeting.

Should the above mitigations prove unsuccessful, the Executive Committee should evaluate all options for the organization to reduce expenses to a sustainable manner. This can include merging management with other organizations, merging the organization collectively with another, or ceasing operations altogether, in which case the organization will be dissolved according to the bylaws and applicable laws.

YEAR-ROUND ACTIVITIES

USAHA is a year-round organization, and is often asked to comment on specific issues related to its mission. USAHA should first refer to its resolutions to address a given issue.

USAHA staff will act upon all resolutions as directed by the membership and Board of Directors, involving necessary correspondence. For issues that arise, that pertain to resolutions, can have direct action taken as deemed necessary. No additional voting is necessary, though the input of the executive committee is encouraged.

Should an issue be presented that no resolution has been approved, the Executive Director/Secretary will coordinate with President and First Vice President (Chair of Government Relations) to determine if USAHA should address the specific issue, with consensus from the Executive Committee.

SPECIAL FUNDS POLICY

USAHA will manage special funds for Committees and closely related organizations to house finances and bookkeeping services. Special funds will be held separate of the general USAHA fund, and USAHA will record transactions accordingly. USAHA will enter into a written agreement for each account with the primary representative of the group or Committee and a designated treasurer for that account. The designated account treasurer holds authority for all transactions. Special fund oversight is held by the USAHA Treasurer with support of the Secretary/Executive Director.

JOB POSTINGS FOR NEWS ALERTS AND WEB SITE

USAHA has available opportunities for distributing position announcements through its daily News Alert Summaries, currently on a weekly basis. The following policy sets forth guidelines for use of this service.
III. B. USAHA ADMINISTRATIVE POLICIES

USAHA Job Postings are available to any member of the association at no fee. The association will post positions to its web site in addition to the distribution among members.

Non-member groups may also submit positions, however, are subject to review and approval for distribution. The following criteria will be considered:

1) Animal health or animal agriculture related
2) Fields of veterinary medicine, research, diagnostics, regulatory, technical services, non-profit, and/or other related supporting disciplines
3) Align with the mission of USAHA

USAHA reserves the right to refuse posting of any position.

OFFICIAL AGENCY, ALLIED ORGANIZATION MEMBER SUBSTITUTIONS

Official Agency and Allied Organization Members have a designated representative to serve on the board of directors and receive the member benefits for that organization. Occasionally, the designated representative is unable to attend all or some of the annual meeting. In these instances, the representative can designate a substitution to fulfill their obligations on behalf of their agency/organization. This includes:

- Board of Directors Meetings
- Membership Meetings
- Committee Meetings (of which the original representative is an appointed member)

While the USAHA Bylaws state that proxy voting is not allowed, the substitution is treated differently as a transfer of the representative duties.

POLICIES REGARDING USAHA ANNUAL MEETING

ANNUAL MEETING SPEAKER REGISTRATION/COMPLIMENTARY REGISTRATION

Revised 2011

USAHA will not provide complimentary registration to any member or regular attendee of USAHA annual meetings that is speaking on a committee agenda.

USAHA will provide a complimentary registration to non-member, invited speakers by request for committees for the purpose of presenting to a committee or general session. Requests must be submitted to the USAHA office.

USAHA will consider providing for travel expenses for general session and committee speakers on a limited basis. Requests must be submitted to the Executive Committee in advance, with consideration being given to a proposed speaker’s expertise, timeliness of subject matter, likelihood of attending the meeting otherwise, and budgetary capabilities.
III. B. USAHA ADMINISTRATIVE POLICIES

VIDEO & AUDIO RECORDING OF COMMITTEE PROCEEDINGS
2008
USAHA prohibits third-party video and audio recording of committee meetings at the Annual Meeting.

THIRD PARTY MEETINGS
2008
USAHA will permit related organizations, with missions consistent with those of USAHA, to partner in its Annual Meeting to provide a venue for their gatherings. Agreements are arranged on a case-by-case basis, with input from the Program Chair and approval by the Executive Committee. In general, these organizations are expected to cover related expenses to USAHA for their event. Attendees are also expected to pay registration fees for the Annual Meeting.

AAVLD PARTNERSHIP
2008
USAHA will maintain a Memorandum of Understanding with AAVLD regarding all issues surrounding the Annual Meeting execution. The MOU will serve as a basis for coordination between the two organizations, and be reviewed annually.

ANNUAL MEETING HOST STATE BENEFITS POLICY
2010
As the State hosting the Annual Meeting is often requested to provide support to the organization in terms of staff, supplies and time commitments, USAHA will provide reciprocal in-kind benefits to the hosting State to help offset those costs. USAHA will provide one complimentary registration for every three (3) paid registrations for host state employees. The state animal health official is responsible for communicating the complimentary registration designees to USAHA by the pre-registration deadline. Exceptions to this guideline are subject to review and approval by the Executive Committee.

DIRECTOR, OFFICER AND STAFF RELATED POLICIES

REIMBURSEMENT AND EXPENSES
2008
In accordance with the Bylaws, Section 10.7, USAHA may provide reimbursement or stipend to its officers, board of directors or committee leadership for reasonable expenses incurred while performing specific assignments of the Association. Requests must be submitted to the Executive Committee for approval in advance of the assignment. The
Executive Committee will remain judicious in granting requests and mindful of budgetary limitations when considering requests.

USAHA will reimburse staff for all reasonable expenses incurred while performing duties of the Association. Each individual will furnish full documentation of expenses for audit purposes, subject to review of the Treasurer.

Mileage will be reimbursed at the federal Internal Revenue Service rate.

CONFLICT OF INTEREST POLICY
2008
Due to increased scrutiny of non-profit organizations, by the IRS and requirements for increased transparency, USAHA should have in place a conflict of interest policy for its Board of Directors, Officers and Employees.

Policy:
Any member or employee involved in a business transaction of the United States Animal Health Association in which a conflict of interest may be present, shall notify the Executive Committee promptly. Said individual shall refrain from voting on such transactions, and exclude themselves from deliberations. The individual will refrain from any personal influence on the transaction. A transaction that involves a conflict of interest should be reviewed against relative competitive bids or proposals. Decisions to pursue a transaction with a potential conflict of interest should first uphold the best interests of USAHA, and include terms that are reasonable to USAHA within the given marketplace.

Approvals will be made by the Executive Committee. A written disclosure summarizing any possible conflict of interest shall be kept on file at the USAHA office. Discussion and resolution shall be indicated in the minutes of the USAHA Executive Committee session.

Conflict of interest should be disclosed if: a transaction of USAHA involves any close relative of a Director or Employee as the direct vendor/provider, or the Director/Employee stands material gain through a transaction. A Director or Employee holds financial interest if holdings are of 5% or greater of the potential vendor, or holds position of influence with an organization that seeks to do business with USAHA.

A close relative is defined as any parent, spouse, sibling, child, grandchild, or spouse of the aforementioned. Also to be included would be any individual residing in the same household that would resemble a parental or marital relationship.

WHISTLEBLOWER POLICY
2008
Employees and members of USAHA should report illegal or unethical activities, directly relating to the business of USAHA, to the President. The President, in consultation with the Executive Committee, will then determine
III. B. USAHA ADMINISTRATIVE POLICIES

appropriate actions for investigation, reporting to proper authorities, and reconciliation as necessary.

Employees and members will be provided full confidentiality for reporting such activities, and the President and Executive Committee will ensure due diligence in protecting against retaliation by the organization, its members or other employees and supervisors.

DOCUMENT RETENTION AND DESTRUCTION POLICY
2008
USAHA will maintain all financial records for seven years. They will then be disposed of by either cross-shredding or incineration.

Meeting registrations and membership renewals will be kept for three years.

USAHA PROFESSIONAL DEVELOPMENT SUPPORT
2011
USAHA sees the importance of continuing education for its employees. USAHA may support the opportunities sought by its employees to enhance his/her skill sets. The following is an outline of benefit for employees.

USAHA may provide support as follows:

**General**
Support for professional development must be pre-approved by the employee’s supervisor prior to commitment in order to receive benefits. Any opportunity should be directly beneficial to current job functions or can be justified as direct future benefit to the Association.

**Flexible Scheduling:**
USAHA may work with employee to accommodate scheduling of work hours to allow for professional development. This can include:
- University/College courses during normal work hours
- Conferences/seminars for professional development
- Other events with pre-approval of supervisor

Employees should strive to maintain a full work week (40 hours) by making up any lost time at hours mutually agreed upon by employee and supervisor.

**Academic Courses**
USAHA may support tuition for courses directly beneficial to the employee’s job duties, up to $1000 per fiscal year. Tuition will be reimbursed upon completion of the course by the employee, with a minimum of a C grade or relative “passing” status when grading is not applicable. Courses will be considered regardless of degree/non-degree track.

(*Reimbursements are a taxable benefit.)

**Conference/Seminar registration**
USAHA may support registration costs for conferences, seminars or other related courses (self-directed, web-based, etc.) Such programs should
enhance the employee's ability to do current job functions, or expand skill sets to take on additional duties. USAHA may support up to 3 conferences per year to a maximum of $1000, unless employee is taking academic courses.

**Travel**

Travel, lodging and meals are reimbursable at federal per diem rates for development opportunities outside of local meetings, such as the St. Joseph or Kansas City areas.
III. C. Previous Meetings of the United States Animal Health Association
<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date</th>
<th>Place of Meeting</th>
<th>President</th>
<th>Secretary/Executive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sept. 27-28, 1897 †</td>
<td>Fort Worth, TX</td>
<td>*Mr. C.P. Johnston, Springfield, IL</td>
<td>*Mr. D. O. Lively, Fort Worth, TX</td>
</tr>
<tr>
<td>2</td>
<td>Oct. 11-12, 1898</td>
<td>Omaha, NE</td>
<td>*Mr. C.P. Johnston, Springfield, IL</td>
<td>*Mr. Taylor Riddie, KS</td>
</tr>
<tr>
<td>3</td>
<td>Oct. 11-12, 1899 ††</td>
<td>Chicago, IL</td>
<td>*Mr. C.P. Johnston, Springfield, IL</td>
<td>*Mr. Mortimer Levering, Lafayette, IN</td>
</tr>
<tr>
<td>4</td>
<td>Oct. 2-3, 1900</td>
<td>Louisville, KY</td>
<td>*Mr. C.P. Johnston, Springfield, IL</td>
<td>*Dr. E.T. Eisenman, Louisville, KY</td>
</tr>
<tr>
<td>5</td>
<td>Oct. 8-9, 1901</td>
<td>Buffalo, NY</td>
<td>*Dr. E.P. Niles, VA</td>
<td>*Dr. E.T. Eisenman, Louisville, KY</td>
</tr>
<tr>
<td>6</td>
<td>Sept. 23-24, 1902</td>
<td>Wichita, KS</td>
<td>*Mr. W.H. Dunn, TN</td>
<td>*Mr. Wm. P. Smith, Monticello, IL</td>
</tr>
<tr>
<td>7</td>
<td>Sept. 22-23, 1903</td>
<td>Denver, CO</td>
<td>*Mr. E. Bolton, Woodward, OK</td>
<td>*Mr. Wm. P. Smith, Monticello, IL</td>
</tr>
<tr>
<td>8</td>
<td>Aug. 23-24, 1904</td>
<td>St. Louis, MO</td>
<td>*Dr. J.C. Norton, AZ</td>
<td>*Mr. Wm. P. Smith, Monticello, IL</td>
</tr>
<tr>
<td>9</td>
<td>Aug. 15-16, 1905</td>
<td>Guthrie, OK</td>
<td>*Mr. Wm. P. Smith, Monticello, IL</td>
<td>*Dr. S. H. Ward, St. Paul, MN</td>
</tr>
<tr>
<td>10</td>
<td>Aug. 15-16, 1906</td>
<td>Springfield, IL</td>
<td>*Mr. M. M. Hankins, Quanah, TX</td>
<td>*Dr. S. H. Ward, St. Paul, MN</td>
</tr>
<tr>
<td>11</td>
<td>Sept. 16-17, 1907</td>
<td>Richmond, VA</td>
<td>*Dr. D. F. Luckey, Columbia, MD</td>
<td>*Dr. S. H. Ward, St. Paul, MN</td>
</tr>
<tr>
<td>12</td>
<td>Sept. 14-16, 1908</td>
<td>Washington, DC</td>
<td>*Dr. Charles G. Lamb, CO</td>
<td>*Dr. C. E. Cotton, St. Paul, MN</td>
</tr>
<tr>
<td>13</td>
<td>Sept. 13-15, 1909 †‡</td>
<td>Chicago, IL</td>
<td>*Dr. W. H. Dalrymple, Baton Rouge, LA</td>
<td>*Dr. C. E. Cotton, St. Paul, MN</td>
</tr>
<tr>
<td>14</td>
<td>Dec. 5-7, 1910</td>
<td>Chicago, IL</td>
<td>*Dr. C. E. Cotton, St. Paul, MN</td>
<td>*Mr. J. J. Ferguson, Chicago, IL</td>
</tr>
<tr>
<td>15</td>
<td>Dec. 5-6, 1911</td>
<td>Chicago, IL</td>
<td>*Dr. John F. Devine, Goshen, NY</td>
<td>*Mr. J. J. Ferguson, Chicago, IL</td>
</tr>
<tr>
<td>16</td>
<td>Dec. 3-5, 1912</td>
<td>Chicago, IL</td>
<td>*Dr. Macyck P. Ravener, Madison, IL</td>
<td>*Mr. J. J. Ferguson, Chicago, IL</td>
</tr>
<tr>
<td>17</td>
<td>Dec. 2-4, 1913</td>
<td>Chicago, IL</td>
<td>*Dr. Peter F. Bahnsen, Atlanta, GA</td>
<td>*Mr. J. J. Ferguson, Chicago, IL</td>
</tr>
<tr>
<td>18</td>
<td>Feb. 16-18, 1914</td>
<td>Chicago, IL</td>
<td>*Dr. S.H. Ward, St. Paul, MN</td>
<td>*Mr. J. J. Ferguson, Chicago, IL</td>
</tr>
<tr>
<td>19</td>
<td>Dec. 2-3, 1915</td>
<td>Chicago, IL</td>
<td>*Dr. J. L. Gibson, Des Moines, IA</td>
<td>*Mr. J. J. Ferguson, Chicago, IL</td>
</tr>
<tr>
<td>20</td>
<td>Dec. 5-7, 1916</td>
<td>Chicago, IL</td>
<td>*Dr. O. E. Dyson, Springfield, IL</td>
<td>*Mr. J. J. Ferguson, Chicago, IL</td>
</tr>
<tr>
<td>21</td>
<td>Dec. 3-5, 1917</td>
<td>Chicago, IL</td>
<td>*Dr. J. G. Wills, Albany NY</td>
<td>*Dr. S. H. Ward, St. Paul, MN</td>
</tr>
<tr>
<td>22</td>
<td>Dec. 2-4, 1918</td>
<td>Chicago, IL</td>
<td>*Dr. M. Jacob, Knoxville, TX</td>
<td>*Dr. S. H. Ward, St. Paul, MN</td>
</tr>
<tr>
<td>23</td>
<td>Dec. 1-3, 1919</td>
<td>Chicago, IL</td>
<td>*Dr. G. W. Dumphy, Lansing, MI</td>
<td>*Dr. D. M. Cambpell, Chicago, IL</td>
</tr>
<tr>
<td>Meeting</td>
<td>Date</td>
<td>Place of Meeting</td>
<td>President</td>
<td>Secretary/Executive</td>
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<tr>
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<tr>
<td>24</td>
<td>Nov. 29-Dec. 1, 1920</td>
<td>Chicago, IL</td>
<td>*Dr. S. F. Musselman, Frankfort, KY</td>
<td>*Dr. D. M. Cambpell, Chicago, IL</td>
</tr>
<tr>
<td>25</td>
<td>Nov. 28-30, 1921</td>
<td>Chicago, IL</td>
<td>*Dr. W. F. Crewe, Bismarck, MD</td>
<td>*Dr. Theo. Burnett, Columbus, OH</td>
</tr>
<tr>
<td>26</td>
<td>Dec. 6-8, 1922</td>
<td>Chicago, IL</td>
<td>*Dr. T. E. M. Munce, Harrisburg, PA</td>
<td>*Dr. Theo. Burnett, Columbus, OH</td>
</tr>
<tr>
<td>27</td>
<td>Dec. 5-7, 1923</td>
<td>Chicago, IL</td>
<td>*Dr. W. J. Butler, Henena, MT</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>28</td>
<td>Dec. 3-5, 1924</td>
<td>Chicago, IL</td>
<td>*Dr. J. G. Ferneyhough, Richmond, VA</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>29</td>
<td>Dec. 2-4, 1925</td>
<td>Chicago, IL</td>
<td>*Dr. J. H. McNeil, Trenton, NJ</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>30</td>
<td>Dec. 1-3, 1926</td>
<td>Chicago, IL</td>
<td>*Dr. John R. Mohler, Washington, DC</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>31</td>
<td>Nov. 30-Dec. 2, 1927</td>
<td>Chicago, IL</td>
<td>*Dr. L. Van Es, Lincoln, NE</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>32</td>
<td>Dec. 5-7, 1928</td>
<td>Chicago, IL</td>
<td>*Dr. C. A. Cary, Auburn, AL</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>33</td>
<td>Dec. 4-6, 1929</td>
<td>Chicago, IL</td>
<td>*Dr. Chas. O. Lamb, Denver, CO</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>34</td>
<td>Dec. 3-5, 1930</td>
<td>Chicago, IL</td>
<td>*Dr. A. E. Wright, Washington, DC</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>35</td>
<td>Dec. 2-4, 1931</td>
<td>Chicago, IL</td>
<td>*Dr. J. W. Connaway, Columbia, MD</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>36</td>
<td>Nov. 30-Dec. 2, 1932</td>
<td>Chicago, IL</td>
<td>*Dr. Peter Malcolm, Des Moines, IA</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>37</td>
<td>Dec. 6-8, 1933</td>
<td>Chicago, IL</td>
<td>*E. T. Faulder, Albany, NY</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>38</td>
<td>Dec. 5-7, 1934</td>
<td>Chicago, IL</td>
<td>*Dr. T. E. Robinson, Providence, RI</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>39</td>
<td>Dec. 4-6, 1935</td>
<td>Chicago, IL</td>
<td>*Dr. Edward Records, Reno, NV</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
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<td>40</td>
<td>Dec. 2-4, 1936</td>
<td>Chicago, IL</td>
<td>*Dr. Walter Wisnicky, Madison, WI</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
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<td>41</td>
<td>Dec. 1-3, 1937</td>
<td>Chicago, IL</td>
<td>*Dr. R. W. Smith, Concord, NH</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
</tr>
<tr>
<td>42</td>
<td>Nov. 30-Dec. 2, 1938</td>
<td>Chicago, IL</td>
<td>*Dr. D. E. Westmoreland, Frankfort, KY</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
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<td>43</td>
<td>Dec. 6-8, 1939</td>
<td>Chicago, IL</td>
<td>*Dr. J. L. Axby, Indianapolis, IN</td>
<td>*Dr. O. E. Dyson, Kansas City, MO</td>
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<td>44</td>
<td>Dec. 4-6, 1940</td>
<td>Chicago, IL</td>
<td>*Dr. H. D. Port, Cheyenne, WY</td>
<td>*Dr. Mark Welsh, College Park MD</td>
</tr>
<tr>
<td>45</td>
<td>Dec. 3-5, 1941</td>
<td>Chicago, IL</td>
<td>*Dr. E. A. Crossman, Boston, MA</td>
<td>*Dr. Mark Welsh, College Park MD</td>
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<td>46</td>
<td>Dec. 2-4, 1942</td>
<td>Chicago, IL</td>
<td>*Dr. I. S. McAdory, Auburn, AL</td>
<td>*Dr. Mark Welsh, College Park MD</td>
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<tr>
<td>47</td>
<td>Dec. 1-3, 1943</td>
<td>Chicago, IL</td>
<td>*Dr. W. H. Hendricks, Salt Lake City, UT</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<tr>
<td>Meeting</td>
<td>Date</td>
<td>Place of Meeting</td>
<td>President</td>
<td>Secretary/Executive</td>
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<td>Dec. 6-8, 1944</td>
<td>Chicago, IL</td>
<td>*Dr. J. M. Sutton, Atlanta, GA</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>49</td>
<td>Dec. 5-7, 1945</td>
<td>Chicago, IL</td>
<td>*Dr. C. U. Duckwork, Sacramento, CA</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>50</td>
<td>Dec. 4-6, 1946</td>
<td>Chicago, IL</td>
<td>*Dr. William Moore, Raleigh, NC</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>51</td>
<td>Dec. 3-5, 1947</td>
<td>Chicago, IL</td>
<td>*Dr. Will J. Miller, Topeka, KS</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
</tr>
<tr>
<td>52</td>
<td>Oct. 13-15, 1948</td>
<td>Denver, CO</td>
<td>*Dr. Jean V. Knapp, Tallahassee, FL</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
</tr>
<tr>
<td>53</td>
<td>Oct. 12-14, 1949</td>
<td>Columbus, OH</td>
<td>*Dr. T. O. Brandenburg, Bismarck, ND</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>54</td>
<td>Nov. 1-3, 1950</td>
<td>Phoenix, Az</td>
<td>*Dr. C. P. Bishop, Harrisburg, PA</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>55</td>
<td>Nov. 14-16, 1951</td>
<td>Kansas City, KS</td>
<td>*Mr. F. E. Mollin, Denver, CO</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<tr>
<td>56</td>
<td>Oct. 29-31, 1952</td>
<td>Louisville, KY</td>
<td>*Dr. Ralph L. West, St. Paul, MN</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>57</td>
<td>Sept. 23-25, 1953</td>
<td>Atlantic City, NJ</td>
<td>*Dr. T. Childs, Ottawa, Canada</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>58</td>
<td>Nov. 10-12, 1954</td>
<td>Omaha, NE</td>
<td>*Dr. T. C. Green, Charleston, WV</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<tr>
<td>59</td>
<td>Nov. 16-18, 1955</td>
<td>New Orleans, LA</td>
<td>*Dr. H. E. Wilkins, Helena, MT</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>60</td>
<td>Nov. 28-30, 1956</td>
<td>Chicago, IL</td>
<td>*Dr. A. L. Brueckner, Baltimore, MD</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>61</td>
<td>Nov. 13-15, 1957</td>
<td>St. Louis, MO</td>
<td>*Dr. G. H. Good, Cheyenne, WY</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>62</td>
<td>Nov. 4-6, 1958</td>
<td>Miami Beach, FL</td>
<td>*Dr. John G. Milligan, Montgomery, AL</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<tr>
<td>63</td>
<td>Nov. 15-18, 1959</td>
<td>San Francisco, CA</td>
<td>*Mr. F. G. Buzzell, Augusta, ME</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<tr>
<td>64</td>
<td>Oct. 17-21, 1960</td>
<td>Charleston, WV</td>
<td>*Dr. J. R. Hay, Chicago, IL</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>65</td>
<td>Oct. 30-Nov. 3, 1961</td>
<td>Minneapolis, MN</td>
<td>*Dr. A. P. Schneider, Boise, ID</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>66</td>
<td>Oct. 30-Nov. 2, 1962</td>
<td>Washington, DC</td>
<td>*Dr. W. L. Bendix, Richmond, VA</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<tr>
<td>67</td>
<td>Oct. 15-18, 1963</td>
<td>Albuquerque, NM</td>
<td>*Dr. T. J. Grennan, Jr. Providence, RI</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>69</td>
<td>Oct. 25-29, 1965</td>
<td>Lansing, MI</td>
<td>*Dr. J. W. Safford, Helena, MT</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<tr>
<td>70</td>
<td>Oct. 10-14, 1966</td>
<td>Buffalo, NY</td>
<td>Dr. C. L. Campbell, Tallahassee, FL</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<td>71</td>
<td>Oct. 16-20, 1967</td>
<td>Phoenix, AZ</td>
<td>*Dr. Grant S. Kaley, Albany, NY</td>
<td>*Dr. R. A. Hendershott, Trenton, NJ</td>
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<tr>
<td>Meeting</td>
<td>Date</td>
<td>Place of Meeting</td>
<td>President</td>
<td>Secretary/Executive</td>
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<td>72</td>
<td>Oct. 6-11, 1958</td>
<td>New Orleans, IA</td>
<td>*Dr. John F. Quinn, Lansing, MI</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
</tr>
<tr>
<td>73</td>
<td>Oct. 12-19, 1969</td>
<td>Milwaukee, WI</td>
<td>*Dr. John L. Oharra, Reno, NV</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
</tr>
<tr>
<td>74</td>
<td>Oct. 18-23, 1970</td>
<td>Philadelphia, PA</td>
<td>*Dr. Frank B. Wheeler, Baton Rouge, LA</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
</tr>
<tr>
<td>75</td>
<td>Oct. 24-29, 1971</td>
<td>Oklahoma City, OK</td>
<td>*Dr. M.D. Mitchell, Pierre, SD</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
</tr>
<tr>
<td>76</td>
<td>Nov. 5-10, 1972</td>
<td>Miami Beach, FL</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
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<td>77</td>
<td>Oct. 14-19, 1973</td>
<td>St. Louis, MO</td>
<td>*Dr. W. C. Tobin, Denver, CO</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
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<td>78</td>
<td>Oct. 13-18, 1974</td>
<td>Roanoke, VA</td>
<td>*Mr. O. H. Timm, Dixon, CA</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
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<td>79</td>
<td>Nov. 2-7, 1975</td>
<td>Portland, OR</td>
<td>*Dr. J. E. Andrews, GA</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
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<td>80</td>
<td>Nov. 7-12, 1976</td>
<td>Miami Beach, FL</td>
<td>*Dr. H. E. Goldstein, Columbus, OH</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
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<td>81</td>
<td>Oct. 16-21, 1977</td>
<td>Minneapolis, MN</td>
<td>*Dr. A. E. Janawicz, Montpelier, VT</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
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<td>82</td>
<td>Oct. 21-Nov. 3, 1978</td>
<td>Buffalo, NY</td>
<td>**Dr. L. E. Bartell, Sacramento, CA</td>
<td>*Dr. W.L. Bendix, Richmond, VA</td>
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<td>83</td>
<td>Oct. 28-Nov. 2, 1979</td>
<td>San Diego, CA</td>
<td>*Dr. T. F. Zweigart, Raleigh, NC</td>
<td>Dr. J. C. Shook, Hyattsville, MD</td>
</tr>
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<td>84</td>
<td>Nov. 2-7, 1980</td>
<td>Louisville, KY</td>
<td>*Mr. B. W. Hawkins, Ontario, OR</td>
<td>Dr. J. C. Shook, Hyattsville, MD</td>
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<td>85</td>
<td>Oct. 11-16, 1981</td>
<td>St. Louis, MO</td>
<td>*Dr. L. W. Hinchman, Indianapolis, IN</td>
<td>Dr. J. C. Shook, Hyattsville, MD</td>
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<td>86</td>
<td>Nov. 7-12, 1982</td>
<td>Nashville, TN</td>
<td>Dr. G. B. Rea Salem, OR</td>
<td>Dr. J. C. Shook, Hyattsville, MD</td>
</tr>
<tr>
<td>87</td>
<td>Oct. 15-21, 1983</td>
<td>Las Vegas, NV</td>
<td>Dr. J. R. Ragan, Nashville, TN</td>
<td>Dr. J. C. Shook, Annapolis, MD</td>
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<tr>
<td>88</td>
<td>Oct. 21-26, 1984</td>
<td>Fort Worth, TX</td>
<td>*Mr. J. O. Pearce, Jr. Okeechobee, FL</td>
<td>Dr. J. C. Shook, Annapolis, MD</td>
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<td>89</td>
<td>Oct. 27-Nov. 1, 1985</td>
<td>Milwaukee, WI</td>
<td>*Dr. David U. Walker, Montpelier, VT</td>
<td>Dr. J. C. Shook, Annapolis, MD</td>
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<td>90</td>
<td>Oct. 14-19, 1986</td>
<td>Louisville, KY</td>
<td>*Dr. N. W. Kruse, Lincoln, NE</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>91</td>
<td>Oct. 25-30, 1987</td>
<td>Salt Lake City, UT</td>
<td>*Dr. J. F. Hudelson, Denver, Co</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>92</td>
<td>Oct. 16-21, 1988</td>
<td>Little Rock, AR</td>
<td>*Dr. J. A. Cobb, Atlanta, GA</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>93</td>
<td>Oct. 28-Nov. 3, 1989</td>
<td>Las Vegas, NV</td>
<td>Mr. P. E. Bradshaw, Griggsville, IL</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>94</td>
<td>Oct. 6-12, 1990</td>
<td>Denver, CO</td>
<td>Dr. M. A. Van Buskirk, Harrisburg, PA</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>95</td>
<td>Oct. 26-Nov. 1, 1991</td>
<td>San Diego, CA</td>
<td>*Dr. P. L. Smith, Sacramento, CA</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>Meeting</td>
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<td>Place of Meeting</td>
<td>President</td>
<td>Secretary/Executive</td>
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<td>96</td>
<td>Oct. 31-Nov. 6, 1992</td>
<td>Louisville, KY</td>
<td>Dr. J. Lee Alley, Montgomery, AL</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>97</td>
<td>Oct. 23-29, 1993</td>
<td>Las Vegas, NV</td>
<td>Dr. T. J. Hagerty, St. Paul, MN</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>98</td>
<td>Oct. 29-Nov. 4, 1994</td>
<td>Grand Rapids, MI</td>
<td>Mr. J. B. Finley, Jr., Encinal, TX</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>99</td>
<td>Oct. 28-Nov. 3, 1995</td>
<td>Reno, NV</td>
<td>Dr. H. Wesley Towers, Dover, DE</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>100</td>
<td>Oct. 12-18, 1996</td>
<td>Little Rock, AR</td>
<td>Dr. M. R. Marshall, Salt Lake City, UT</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>101</td>
<td>Oct. 17-24, 1997</td>
<td>Louisville, KY</td>
<td>Dr. Larry L. Williams, Lincoln NE</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>102</td>
<td>Oct. 3-9, 1998</td>
<td>Minneapolis, MN</td>
<td>Dr. Richard H. McCapes, Davis, CA</td>
<td>Dr. J. C. Shook, Mechanicsburg, PA</td>
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<td>103</td>
<td>Oct. 19-26, 2000</td>
<td>Birmingham, AL</td>
<td>Dr. Ernest W. Zirkle, Trenton, NJ</td>
<td>Dr. J Lee Alley, Montgomery, AL</td>
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<td>104</td>
<td>Nov. 1-8, 2001</td>
<td>Hershey, PA</td>
<td>Dr. Bob R. Hillman, Boise, ID</td>
<td>Dr. J Lee Alley, Montgomery, AL</td>
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<td>105</td>
<td>Oct. 1-24, 2002</td>
<td>St. Louis, MO</td>
<td>Dr. Maxwell Lea, Jr., Baton Rouge, LA</td>
<td>Dr. J Lee Alley, Montgomery, AL</td>
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<td>107</td>
<td>Oct. 9-16, 2003</td>
<td>San Diego, CA</td>
<td>*Mr. Bob Frost, Lincoln, CA</td>
<td>Dr. J Lee Alley, Montgomery, AL</td>
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<td>108</td>
<td>Oct. 21-27, 2004</td>
<td>Greensboro, NC</td>
<td>Dr. Donald Lein, Ithaca, NY</td>
<td>Dr. J Lee Alley, Montgomery, AL</td>
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<td>109</td>
<td>Nov. 3-9, 2005</td>
<td>Hershey, PA</td>
<td>Dr. Richard D. Willer, Phoenix, AZ</td>
<td>Dr. J Lee Alley, Montgomery, AL</td>
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<td>110</td>
<td>Oct. 12-18, 2006</td>
<td>Minneapolis, MN</td>
<td>Dr. Bret D. Marsh, Indianapolis, IN</td>
<td>Dr. J Lee Alley, Montgomery, AL</td>
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<td>111</td>
<td>Oct. 18-24, 2007</td>
<td>Reno, NV</td>
<td>Dr. Lee M. Myers, Atlanta, GA</td>
<td>Dr. J Lee Alley, Montgomery, AL</td>
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<td>112</td>
<td>Oct. 23-29, 2008</td>
<td>Greensboro, NC</td>
<td>Mr. James W. Leafstedt, Alcester, SD</td>
<td>Mr. Benjamin Richey, St. Joseph, MO</td>
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<td>113</td>
<td>Oct. 8-14, 2009</td>
<td>San Diego, CA</td>
<td>Dr. Donald E. Hoenig, Belfast, ME</td>
<td>Mr. Benjamin Richey, St. Joseph, MO</td>
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<td>114</td>
<td>Nov. 11-17, 2010</td>
<td>Minneapolis, MN</td>
<td>Dr. Richard E. Breitmeyer, Sacramento, CA</td>
<td>Mr. Benjamin Richey, St. Joseph, MO</td>
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<tr>
<td>115</td>
<td>Sept. 29-Oct. 5, 2011</td>
<td>Buffalo, NY</td>
<td>Dr. Steven L. Halstead, East Lansing, MI</td>
<td>Mr. Benjamin Richey, St. Joseph, MO</td>
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**Key**

* Deceased  † Last meeting of the Interstate Association of Livestock Sanitary Boards
** Resigned Dec. 12, 1977  †† Reprinted in 66th Annual Proceedings
† Reprinted in 54th Annual Proceedings  § USAHA hired an Executive Director, in lieu of the Secretary, effective 2006-2007
III. D. USAHA Medal of Distinction Award Winners
USAHA MEDAL OF DISTINCTION RECIPIENTS

110th Annual Meeting, Minneapolis Minnesota – 2006
Dr. Clarence L. Campbell, Tallahassee, Florida
Dr. Richard H. McCapes, Davis, California

111th Annual Meeting, Reno, Nevada – 2007
Dr. J. Lee Alley, Montgomery, Alabama
Mrs. Linda B. Ragland, Richmond, Virginia

Dr. John C. Shook, Mechanicsburg, Pennsylvania

113th Annual Meeting, San Diego, California – 2009
Dr. Bret E. Marsh, Indianapolis, Indiana

114th Annual Meeting, Minneapolis, Minnesota – 2010
Mr. Neal F. Black, Eagan, Minnesota
Dr. Thomas J. Hagerty, St. Michael, Minnesota

Dr. Bob E. Hillman, Boise, Idaho
IV. GLOSSARY OF COMMONLY USED ACRONYMS
### IV. GLOSSARY OF ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>AAHSC</td>
<td>Aquatic Animal Health Standards Commission</td>
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<tr>
<td>AAVCT</td>
<td>American Academy of Veterinary and Comparative Toxicology</td>
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<td>AAVLD</td>
<td>American Association of Veterinary Laboratory Diagnosticians</td>
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<td>ABADRL</td>
<td>Arthropod-Borne Animal Disease Research Laboratory</td>
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<tr>
<td>ABSL</td>
<td>Animal Biosafety Levels</td>
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<td>AC</td>
<td>Animal Care (USDA-APHIS)</td>
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<td>ACE</td>
<td>Antigen Capture ELISA</td>
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<td>ACVIM</td>
<td>American College of Veterinary Internal Medicine</td>
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<td>ADT</td>
<td>Animal disease traceability</td>
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<td>AF</td>
<td>Accredited Free</td>
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<td>AFIA</td>
<td>American Feed Industry Association</td>
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<td>AFS</td>
<td>American Fisheries Society</td>
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<td>AFWA</td>
<td>Association of Fish and Wildlife Agencies</td>
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<td>AHP</td>
<td>Animal Health and Production Division</td>
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<td>AHPA</td>
<td>Animal Health Protection Act</td>
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<td>AHSISC</td>
<td>Animal Health Surveillance and Information Systems Committee</td>
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<td>AHSM</td>
<td>Animal Health Surveillance and Management</td>
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<tr>
<td>AICAP</td>
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<tr>
<td>AI-CMC</td>
<td>Avian Influenza Crisis Management Center</td>
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<tr>
<td>ANV</td>
<td>Avian nephritis virus</td>
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<td>APHIS</td>
<td>Animal and Plant Health Inspection Service</td>
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<td>APIC</td>
<td>Association for Professionals in Infection Control and Epidemiology</td>
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<tr>
<td>ARS</td>
<td>Agriculture Research Service</td>
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<td>BCG</td>
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<td>Brucellosis Emergency Action Plan</td>
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### IV. GLOSSARY OF ACRONYMS

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<th>Acronym</th>
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<tr>
<td>BQFS</td>
<td>Bison Quarantine Feasibility Study</td>
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<td>BRT</td>
<td>Brucellosis ring test</td>
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<tr>
<td>BSC</td>
<td>Biological Standard Commission</td>
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<td>BSE</td>
<td>Bovine spongiform encephalopathy</td>
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<tr>
<td>BSL</td>
<td>Breed-specific legislation</td>
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<tr>
<td>BTV</td>
<td>Bluetongue virus</td>
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<tr>
<td>BVDV</td>
<td>Bovine diarrhea virus</td>
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<td>CAC</td>
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<td>CAV</td>
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<td>CBPP</td>
<td>Contagious bovine pleuropneumonia</td>
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<td>Centers for Disease Control and Prevention</td>
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<td>CEAH</td>
<td>Centers for Epidemiology and Animal Health</td>
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<tr>
<td>CEI</td>
<td>Center for Emerging Issues</td>
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<td>CEM</td>
<td>Contagious equine metritis</td>
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<td>CENAPA</td>
<td>National Parasite and Toxic Residue Laboratory (Mexico)</td>
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<td>CENASA</td>
<td>National Animal Disease Laboratory (Mexico)</td>
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<td>CFIA</td>
<td>Canadian Food Inspection Agency</td>
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<td>CFR</td>
<td>Code of Federal Regulations</td>
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<td>CI/KR</td>
<td>Critical infrastructure and key resources</td>
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<td>CIMBS</td>
<td>The Center for Research at the Interface of Mathematical and Biological Sciences</td>
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<tr>
<td>CMC</td>
<td>Crisis Management Center</td>
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<td>CNS</td>
<td>Central Nervous System</td>
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<td>COMEXA</td>
<td>Mexico - United States Commission on the Eradication of Livestock Screwworm</td>
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<td>CONASA</td>
<td>Consejo Nacional de Salud Animal</td>
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<td>COOL</td>
<td>Country of Origin Labeling</td>
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<td>CPA</td>
<td>Mexico - United States Commission on the Eradication of Foot-and-Mouth Disease and Other Foreign Animal Diseases</td>
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<td>Consumer Price Index</td>
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<td>CSF</td>
<td>Classical swine fever</td>
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<td>CSPS</td>
<td>Caprine Scrapie Prevalence Study</td>
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### IV. GLOSSARY OF ACRONYMS

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<tr>
<th>Acronym</th>
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<td>Certificate of Veterinary Inspection</td>
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<td>CVM</td>
<td>Center for Veterinary Medicine (FDA)</td>
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<td>CWD</td>
<td>Chronic wasting disease</td>
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<td>DAL</td>
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<td>Department of Health and Human Services</td>
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<td>DHIA</td>
<td>Dairy Herd Improvement Association</td>
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<td>DHS</td>
<td>Department of Homeland Security</td>
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<td>DIVA</td>
<td>Differentiating Infected from Vaccinated Animals</td>
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<td>DJC</td>
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<td>DNR</td>
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<td>Department of the Interior</td>
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<td>DS</td>
<td>Diplomatic security</td>
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<td>Extension Disaster Education Network</td>
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<td>Equine infectious anemia</td>
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<td>Enzyme Linked Immunosorbent Assay</td>
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<td>Electron microspray</td>
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<td>END</td>
<td>Exotic Newcastle disease</td>
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<td>ESF</td>
<td>Emergency Support Function</td>
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<td>European Union</td>
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<td>FPA</td>
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<td>FY</td>
<td>Fiscal Year</td>
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<td>Good aquaculture practice</td>
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<td>GCC</td>
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<td>Generic Database</td>
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<td>GMP</td>
<td>Good management practices</td>
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<td>GYIBC</td>
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<tr>
<td>HACCP</td>
<td>Hazard analysis and critical control points</td>
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<td>HEYM</td>
<td>Herrold's egg yolk medium</td>
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<td>HD</td>
<td>Hemorrhagic disease</td>
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<td>HPAI</td>
<td>Highly pathogenic avian influenza</td>
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<td>HSIN</td>
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<tr>
<td>IAI</td>
<td>Integrated agricultural intelligence</td>
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<td>IBH</td>
<td>Inclusion body hepatitis</td>
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<td>IBMP</td>
<td>Interagency Bison Management Plan</td>
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<td>ICS</td>
<td>Incident Command System</td>
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<td>IFAH</td>
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<td>IHC</td>
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<td>ILRI</td>
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<td>ITRCB</td>
<td>International Technical Regulatory Capacity Building</td>
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<td>JEI</td>
<td>Johne's Education Initiative</td>
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<td>Acronym</td>
<td>Description</td>
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<td>JPPD</td>
<td>Johnin purified protein derivative</td>
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<td>LBMS</td>
<td>Live Bird Marketing System</td>
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<tr>
<td>LC/MS</td>
<td>Liquid Chromatography/Mass Spectroscopy</td>
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<td>LPAI</td>
<td>Low Pathogenic avian influenza</td>
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<td>LPNAI</td>
<td>Low Pathogenic notifiable avian influenza</td>
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<td>MA</td>
<td>Modified Accredited</td>
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<tr>
<td>MAA</td>
<td>Modified Accredited Advanced</td>
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<td>MAC</td>
<td>Multi-agency coordination committee</td>
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<td>Mycobacterium avium paratuberculosis</td>
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<td>MAZ</td>
<td>Modified Accredited Zone</td>
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<td>MDR</td>
<td>Multi-drug resistant</td>
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<td>MIM</td>
<td>Mobile Information Management</td>
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<td>MOU</td>
<td>Memorandum of Understanding</td>
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<td>MST</td>
<td>Microbial Source Tracking</td>
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<td>Minor Use/Minor Species</td>
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<td>NADC</td>
<td>National Animal Disease Center</td>
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<td>NAHLN</td>
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<td>NAHMS</td>
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<td>National Animal Health Surveillance System</td>
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<td>NAIS</td>
<td>National Animal Identification System</td>
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<td>NARMS</td>
<td>National Anti-Microbial Resistance Monitoring System</td>
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<td>NCBA</td>
<td>National Cattlemen's Beef Association</td>
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<td>NCFAD</td>
<td>National Centre for Foreign Animal Disease</td>
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<td>NCIE</td>
<td>National Center for Import and Export</td>
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<td>NCUSAHA</td>
<td>North Central USAHA (District)</td>
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<td>NDV</td>
<td>Newcastle disease virus</td>
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<td>NER</td>
<td>National Elk Refuge Bison</td>
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<td>Northeast USAHA (District)</td>
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<td>NIAA</td>
<td>National Institute for Animal Agriculture</td>
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<td>NIH</td>
<td>National Institute of Health</td>
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### IV. GLOSSARY OF ACRONYMS

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<th>Acronym</th>
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<td>NJDDHP</td>
<td>National Johne’s Disease Demonstration Herd Project</td>
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<td>NJWG</td>
<td>National Johne’s Working Group</td>
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<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
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<td>NPB</td>
<td>National Pork Board</td>
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<td>NPD</td>
<td>National Preparedness Directorate</td>
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<td>NPIP</td>
<td>National Poultry Improvement Plan</td>
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<td>NPS</td>
<td>National Park Service</td>
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<td>National Response Framework</td>
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<td>National Science and Technology Council</td>
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<td>National Veterinary Accreditation Program</td>
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<td>National Veterinary Stockpile (USDA)</td>
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<td>Online Certificate of Veterinary Inspections System</td>
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<td>Optical density</td>
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<td>Office of Health Affairs (DHS)</td>
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<td>OM</td>
<td>Osteomyelitis</td>
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<td>ORST</td>
<td>Outbreak Response and Surveillance Team</td>
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<td>Office of Science and Technology Policy</td>
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<td>PADOH</td>
<td>Pennsylvania Department of Health</td>
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<tr>
<td>PC</td>
<td>Pre-conditioning</td>
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<td>PBS</td>
<td>Phosphate buffered saline</td>
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<td>PCR</td>
<td>Polymerase chain reaction</td>
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<td>PCV 2</td>
<td>Porcine circovirus 2</td>
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<td>PETS</td>
<td>Pets Evacuation and Transportation Standards Act</td>
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<td>PFGE</td>
<td>Pulsed Field gel electrophoresis</td>
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<td>PFI</td>
<td>Pet Food Institute</td>
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<td>PHLIS</td>
<td>Public Health Laboratory Information Systems</td>
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<td>Pork Industry Identification Working Group</td>
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<td>Payette National Forest</td>
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<td>PQA</td>
<td>Pork Quality Assurance</td>
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<td>PRRS(V)</td>
<td>Porcine respiratory and reproductive syndrome (virus)</td>
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### IV. GLOSSARY OF ACRONYMS

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<td>Proficiency Test</td>
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<td>PVS</td>
<td>Performance, Vision and Strategy</td>
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<td>RA/HMP</td>
<td>Risk Assessments/Herd Management Plans</td>
</tr>
<tr>
<td>RAPIDD</td>
<td>The Research and Policy for Infectious Disease Dynamics</td>
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<tr>
<td>RES</td>
<td>Regionalization Evaluation Services</td>
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<td>RFID</td>
<td>Radio frequency identification</td>
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<td>RSSS</td>
<td>Regulatory Scrapie Slaughter Surveillance</td>
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<tr>
<td>RT-PCR</td>
<td>Real-Time Polymerase Chain Reaction</td>
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<td>Secretary of Agriculture, Ranching, Rural Development, Fisheries and Food Supply (Mexico)</td>
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<tr>
<td>SAHA</td>
<td>Southern Animal Health Association (District)</td>
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<tr>
<td>SB</td>
<td>Brucella suis (swine brucellosis)</td>
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<td>Southeastern Cooperative Wildlife Disease Study</td>
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<td>SENASICA</td>
<td>National Services of Animal and Plant Health, Quality and Food Safety (Mexico)</td>
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<td>Scrapie Flock Certification Program</td>
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<td>SHI</td>
<td>Synergistic Hemolysin Inhibition</td>
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<td>SHTP</td>
<td>Slaughter Horse Transport Program</td>
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<td>SIV</td>
<td>Swine Influenza Virus</td>
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<td>SNGD</td>
<td>Scrapie National Generic Database</td>
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<td>SODA</td>
<td>Statistical Outbrek Detection Algorithm</td>
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<td>SOP</td>
<td>Standard Operating Procedure</td>
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<td>SOSS</td>
<td>Scrapie Ovine Slaughter Surveillance</td>
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<td>Security and Prosperity Partnership of North America</td>
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<td>Swine Welfare Assurance Program</td>
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<td>Targeted Advanced Development</td>
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<td>Tibial dyschondroplasia</td>
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<tr>
<td>TRV</td>
<td>Turkey-origin reovirus</td>
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<td>Transmissible spongiform encephalaphy</td>
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<td>Unified Database</td>
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<tr>
<td>UEP</td>
<td>United Egg Producers</td>
</tr>
<tr>
<td>UHF</td>
<td>Ultra High Frequency</td>
</tr>
<tr>
<td>Acronym</td>
<td>Full Form</td>
</tr>
<tr>
<td>---------</td>
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</tr>
<tr>
<td>UM&amp;R</td>
<td>Uniform Methods &amp; Rules</td>
</tr>
<tr>
<td>USAHA</td>
<td>United States Animal Health Association</td>
</tr>
<tr>
<td>USDA</td>
<td>United States Department of Agriculture</td>
</tr>
<tr>
<td>USFS</td>
<td>United States Forest Service</td>
</tr>
<tr>
<td>USFW</td>
<td>United States Fish &amp; Wildlife Services</td>
</tr>
<tr>
<td>VBJDCP</td>
<td>Voluntary Bovine Johne's Disease Control Program</td>
</tr>
<tr>
<td>VHS(v)</td>
<td>Viral Hemmoragic Septicemia (Virus)</td>
</tr>
<tr>
<td>VICH</td>
<td>International Cooperation on Harmonization of Technical Requirements for Registration of Veterinary Medicinal Products</td>
</tr>
<tr>
<td>VIC-S</td>
<td>Veterinary Infection Control Society</td>
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<tr>
<td>VJDHSP</td>
<td>Voluntary Johne's Disease Herd Status Program</td>
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<tr>
<td>VLT</td>
<td>Vaccinal laryngotracheitis</td>
</tr>
<tr>
<td>VS</td>
<td>Veterinary Services (USDA)</td>
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<td>VSPS</td>
<td>Veterinary Service Process Streamling</td>
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<tr>
<td>WAFWA</td>
<td>Western Association of Fish and Wildlife Agencies</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
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<td>Wildlife Services (USDA)</td>
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<td>Western States Livestock Health Association</td>
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<tr>
<td>WTO</td>
<td>World Trade Organization</td>
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<tr>
<td>YNP</td>
<td>Yellowstone National Park</td>
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<tr>
<td>YWHP</td>
<td>Yellowstone Wildlife Health Program</td>
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