REPORT OF THE COMMITTEE ON TRANSMISSIBLE DISEASES OF POULTRY AND OTHER AVIAN SPECIES

Chair: Dr. Julie D. Helm, SC
Vice Chair: Dr. Marion Garcia, WV

Bruce L Akey, NY; John K Atwell, NC; George P Badley AR; Deanna L Baldwin, MD; Marilyn F Balmer, MD; Sue K Billings, KY; Richard E Breitmeyer, CA; Deborah L Brennan, GA; Paul W Brennan, IN; Max Brugh, GA; Tony A Caver, SC; Bruce R Charlton, CA; Jim Clark, ON; Steven R Clark, NC; Max E Coats, Jr., TX; Stephen R Collett, GA; Stephen K Crawford, NH; Sherrill Davison, PA; Thomas J DeLiberto, CO; Don W Waldrip, NC; Brandon Doss, AR; Richard L Dutton, NE; Aly M Fadly, MI; Naola M Ferguson-Noel, GA; Tony M Forshey, OH; Rose Foster, MO; Marion Garcia, WV; Eric N Gingerich, IN; Eric C Gonder, NC; Tanya D Graham, SD; Randy R Green, DC; James C Grimm, TX; Scott J Gustin, AR; Nancy E Halpern, NJ; David A Halvorson, MN; William L Hartmann, MN; Ruud G Hein, DE; Julie D Helm, SC; Michael E Herrin, OK; Bill W Hewat, AR; Heather Hirst, DE; Donald E Hoenig, ME; Frederic J Hoerr, AL; Guy S Hohenhaus, MD; Peter Holt, GA; Floyd P Horn, MD; Danny R Hughes, AR; Dennis A Hughes, NE; John P Huntley, WA; Mark W Jackwood, GA; Eric L Jensen, AL; Hailu Kinde, CA; Gary O Kinder, WV; Bruce L King, UT; Patrice N Klein, MD; Spangler Klopp, DE; Michael D Kopp, IN; Elizabeth A Krushinskie, DE; Hiram N Lasher, DE; Dale C Lauer, MN; Randall L Levings, IA; David J Ligda, IN; Tsang Long Lin, IN; Jose A Linares, TX; Mary J Lis, CT; Martha A Littlefield, LA; Howard M Magwire, MD; Edward T Mallinson, MD; David T Marshall, NC; Sarah J Mason, NC; Hugo Medina, MN; Beatriz E Miguel, NJ; Andrea M Miles, NC; Gay Y Miller, IL; Ricardo A Munoz; TX; Lee M Myers, GA; Thomas J Myers, MD; Steven H Olson, MN; Kristy L Pabilonia, CO; Mary J Pantin-Jackwood, GA; Boyd H Parr, SC; James E Pearson, IA; Patrick M Pilkington, AR; Jewell G Plumley, WV; Michael Poulos, CA; Willie M Reed, IN; G. Donald Ritter, DE; Thomas J Roffe, MT; C. Stephen Roney, GA; A. Gregorio Rosales, AL; Michael L Rybolt, DC; Y.M. Saif, OH; John P Sanders, WV; David D Schmitt, IA; Andy L Schwartz, TX; Jack A Shere; NC, H.L Shivaprasad, CA; Marilyn M Simunich, ID; John A Smith, GA; Joe Starcher, WV; Philip Stayer, MS; Bruce N Stewart-Brown, MD; David L Suarez, GA; Seth R Swafford, CO; David E Swayne, GA; Hilary S Thesmar, DC; Matthew T Torres, MD; H. Wesley Towers, DE; Deoki N Tripathy, IL; Susan C Trock, GA; Patricia S Wakenell, IN; James A Watson, MS; Stephen E Weber, CO; Annette M Whiteford, CA; Richard L Wilkes, VA; Ching-Ching Wu, IN; Ernest W Zirkle, NJ

The Committee met on November 15, 2010 from 1:00 to 6:00 p.m. and November 16, 2010 from 12:35 to 4:30 p.m. at the Hilton in Minneapolis, Minn. There were 51 Committee members and 59 guests in attendance, for a total of 110. Chair Julie D. Helm presided, assisted by Vice-Chair Marion Garcia. The Chair welcomed the Committee, summarized the 2009 meeting, and reported on the responses to the 2009 Resolutions:

Resolution 45 (Combined): "Failure of importing countries to follow world organization for animal health guidelines for importations of animals." Response: "USDA continues to strongly encourage trading partners to meet their obligations as OIE members, recommend a science-based approach, and promote compliance with OIE guidance during all trade negotiations although not all countries do."

Resolution 28: "Cooperative agreement funding for notifiable avian influenza surveillance." Response: "Securing funding to support the H5/H7 LPAI program is an ongoing process. In FY 2009 and FY 2010, these LPAI and HPAI funds were consolidated into a notifiable avian influenza (NAI) budget line item to better integrate and maintain adequate funding and risk-based allocation to participating States for NAI surveillance, prevention, and control activities. In addition, these activities will be maintained despite redirection of some funds to APHIS' Animal Care. APHIS will continue to request sufficient funds to maintain and support the H5/H7 NAI program. The final amount of appropriated funding is at the discretion of the U.S. Congress."

Resolution 30: "Containment of very virulent infectious bursal disease virus in California." Response: "VS recognizes the efforts of the State of California and the poultry industry to control vvIBDV and has been working with California to contain and eliminate this disease before it spreads. In fiscal years 2009 and 2010, APHIS provided $70,000 (through March 2010) to support several ongoing activities of the California Poultry Study Group, such as development of an epidemiology study, enhanced field surveillance, mitigation strategies, and research and development."

Dr. Eric Jensen, Aviagen, Inc, Huntsville, AL and Chair of the Mycoplasma Subcommittee, gave the subcommittee report. The report was approved by the Committee and is included in these proceedings.

Dr. Marion Garcia, Aviagen Turkeys Inc, Lewisburg, West Virginia and Vice-Chair Committee on Transmissible Diseases of Poultry, gave the subcommittee report for the Infectious Laryngotracheitis (ILT)

Subcommittee in the absence of Dr. Sherryll Davidson, Chair of the Infectious Laryngotracheitis Subcommittee. The report was approved by the Committee and is included in these proceedings.

Dr. Mary Pantin-Jackwood, USDA, Agricultural Research Service (ARS), Southeastern Poultry Research Laboratory (SEPRL), gave the Avian Influenza and Newcastle Disease Subcommittee report in the absence of Dr. David Swayne. The report was approved by the Committee and is included in these proceedings.

Dr. Deirdre Johnson, Gold-N-Plump Poultry, presented the annual status report for the broiler industry. The report was approved by the Committee and is included in these proceedings.

Dr. Eric N. Gingerich, Diamond V, delivered the annual status report for the table egg industry. The report was approved by the Committee and is included in these proceedings.

Dr. Steven Clark, Alpharma Animal Health, presented the annual status report for the turkey industry. The report was approved by the Committee and is included in these proceedings.

Dr. Henry Marks, United States Poultry and Egg Association (USP&EA US Poultry Research Advisory Committee, presented a status report from USP&EA. The report was approved by the Committee and is included in these proceedings.

Dr. Ellen Kasari, USDA-APHIS-VS-CEAH National Surveillance Unit, presented an update from National Animal Health Reporting System (NAHRS). The report was approved by the Committee and is included in these proceedings.

Dr. Steve Roney, USDA-APHIS-VS, presented the annual status report for the National Poultry Improvement Plan (NPIP) for the Senior Coordinator, Mr. Andrew H. Rhorer, USDA-APHIS-VS. The report was approved by the Committee and is included in these proceedings.

Ms. Jan Pederson, USDA-APHIS-VS-NVSL, delivered the annual Avian Import Activities and the NVSL Avian Influenza and Newcastle Disease diagnostic reports. The reports were approved by the Committee and are included in these proceedings.

Dr. Matthew Erdman, USDA-APHIS-VS-NVSL, delivered the annual NVSL Diagnostic Bacteriology, Mycoplasma, Pasteurella, and Salmonella report. The report was approved by the committee and is included in these proceedings.

Dr. Fidelis Hegngi, USDA-APHIS-VS, National Center for Animal Health Programs, presented an update on the Live Bird Market System Program. The report was approved by the committee and is included in these proceedings.

Dr. Tom DeLiberto, USDA-APHIS, Wildlife Services (WS), presented an update report on the Migratory Waterfowl Surveillance. The report was approved by the Committee and is included in these proceedings.

The Monday session adjourned at this point, at approximately 6:00 PM. The meeting reconvened at 12:35 PM on Tuesday, November 16, 2010.

Dr. Mary Pantin-Jackwood, USDA, Agricultural Research Service (ARS), Southeastern Poultry Research Laboratory (SEPRL), presented the research update report. The report was approved by the Committee and is included in these proceedings.

Dr. Aly Fadly, Avian Disease and Oncology Lab (ADOL) presented the research update report. The report was approved by the Committee and is included in these proceedings.

Dr. Dale Lauer, Minnesota Poultry Diagnostic Laboratory, presented a case report on H7N9 Low-Pathogenicity Avian Influenza in Minnesota. The report was approved by the Committee and is included in these proceedings.

Dr. Hugo Medina, Sparboe Farms Inc., presented the USDA Emergency Management update on the Secure Egg Supply (SES) Plan. The report was approved by the Committee and is included in these proceedings.

Dr. Michael David, Director of Sanitary International Standards, National Center for Import and Export, USDA-APHIS-VS, was not able to attend the meeting to present the annual update on the World Organization for Animal Health (OIE) poultry activities. The summary report was distributed to the Committee and is included in these proceedings.

Committee Business

The Committee approved a Resolution entitled “United States National List of Reportable Animal Diseases (NLRAD)” requesting that USDA finalize a NLRAD after consulting with stakeholders and then initiate the regulatory process to establish and maintain the NLRAD and associated reporting requirements.

The Committee approved a Resolution entitled “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” requesting that all States and Tribal Agencies incorporate the Secure Egg Supply (SES) Plan into their Highly Pathogenic Avian Influenza (HPAI) response plans.

The Committee approved a Resolution entitled “Need for Targeted Education and Funding for People in Metropolitan Areas Raising Poultry (Urban Chickens/Poultry)” requesting an expansion of educational material produced by Biosecurity for the Birds (Healthy Birds) campaign to include urban poultry target audiences and continue to fund the program.

The Committee approved a Resolution entitled “Involvement of veterinarians in the implementation of the FDA Salmonella enteritidis rule and audit of poultry operation compliance with the Rule” requesting that FDA include veterinarians and poultry subject matter experts in overall implementation of the Egg Safety Rule of 2009.

Resolutions were sent to the Committee on Nominations and Resolutions for review.

REPORT OF THE SUBCOMMITTEE ON MYCOPLASMA

Eric L. Jensen
Aviagen, Inc.

The Subcommittee met at the Minneapolis Hilton on November 14, 2010 with 27 attendees.

National Poultry Improvement Plan (NPIP) Update by Dr. Stephen Roney. A review of percent condemnations for airsacculitis by year for broilers showed a correlation between the implementation of *Mycoplasma gallisepticum* (MG) and *Mycoplasma synoviae* (MS) programs and decline in incidence. The number of cases of MG and, in particular, MS has declined in broiler breeders since the previous year that has resulted in a corresponding decline in the number of broiler cases. *Mycoplasma* plate antigens are a concern with both supply and consistency. The NPIP is working with a European company to import their MG, MS, and possibly MM plate antigen under a conditional license initially. There was some discussion about relative sensitivity of the MS plate antigen and the ELISA test for MS surveillance in turkeys. Dr. Ferguson-Noel will continue to produce a panel of convalescent sera for use by NPIP authorized laboratories and also host the *mycoplasma* workshop in support of NPIP training requirements. This support is invaluable for helping to maintain the high technical standards at NPIP authorized laboratories.

Avian *Mycoplasma* Research Update by Dr. Naola Ferguson-Noel. The current situation for MG in the US is occasional outbreaks in boiler breeders and turkeys and endemic in commercial egg layers. The sequencing of MG isolates shows over 100 different sequence types with predominance of ts-11 and wild house finch types. For broiler breeders, there was a spike in submissions in 2008 and many of these were from flocks vaccinated with ts-11. Over time, the wild-type has disappeared and the ts-11 vaccine has become the most prevalent type identified. Currently there is a situation with ts-11-like type in broilers produced from breeders that were vaccinated with ts-11. There has been no direct evidence of vertical transmission but the broiler isolates cannot be differentiated from the ts-11 vaccine and are virulent. MS outbreaks are more common than MG and about 70% of commercial layers are positive for MS. There is concern that the MS situation in the US changing. Traditional infections were not very virulent but now more virulent isolates are being detected. For turkey surveillance it appears that the plate test is not very sensitive and the ELISA is slow to become positive, and often the flock is asymptomatic. There also appears to be differences in the relative value of the hemagglutination-inhibition (HI) test using tubes and microtiter plates. There was consensus that additional research is needed to develop more sensitive protocols for detecting MS by serology in turkeys. The results of a study comparing different swab types (cotton, polyester, flocked and mini-flocked) and their sensitivity for collecting samples for mycoplasma polymerase chain reaction (PCR) testing found that all swab types were equally effective. Dry swabs work fine, transport media is not needed for PCR. Finally, data was presented from a study on the efficacy of MG vaccines at reducing both air sac lesions and ovary regression. MG vaccines are used in layers primarily for protection of the reproductive tract. The F-strain and bacterin provided the best protection against air sac lesions and ovarian regression.

Arkansas MS Update by Dr. Eric Jensen. Information was presented showing the incidence of MS in broiler breeders in Arkansas over the past two years. The data indicated that the incidence level decreased significantly after the introduction of a live MS vaccine used under a conditional license. It appears that vaccination may be a useful tool for controlling large scale outbreaks of MS.

Analyte Specific Reagent (ASR) from Idexx by Pablo Lopes and Phyllis Tyrrell. This project for the detection of *mycoplasma* DNA is being initiated in response to changes made to the NPIP in 2010 changes that will allow molecular screening for the mycoplasma. This will be a real-time PCR assay for MG, MS and *Mycoplasma meleagridis* (MM). Idexx is asking the industry for partnership in validating the assay by providing both positive and negative samples for evaluation. The benefit will be standardized primers so that results produced by all authorized laboratories conducting the assay will be comparable. The assay will be flexible so that it can be used with many different platforms.

REPORT OF THE SUBCOMMITTEE ON INFECTIOUS LARYNGOTRACHEITIS (ILT)

Marion Garcia
Aviagen Turkeys Inc

Dr. Naola Ferguson-Noel reviewed research that has been conducted by Dr. Maricarmen Garcia. This research looked at the effectiveness of using vectored vaccine at ½ dose in ovo. Fowl Pox (FP) and Herpes Virus (HV) vectored vaccines were compared to Tissue Culture (TC) vaccines in a challenge model. Vaccinated and control birds were challenged at 35 or 57 days post-vaccination. Both vectored vaccines allowed colonization and shedding of ILT at both challenge times. HV vectored vaccine decreased clinical signs at 35 days and both vectored vaccines decreased clinical signs at 57 days. The regional updates discussed the control and vaccination programs being used in various areas of the country. There are many different control programs in use with many different levels of efficacy.

REPORT OF THE SUBCOMMITTEE ON AVIAN INFLUENZA AND NEWCASTLE DISEASE

Mary Pantin-Jackwood, David Swayne, Claudio Afonso and Patti Miller
USDA-ARS-SEPRL

The subcommittee gives the following summary on exotic diseases of poultry as provided by the World Organization for Animal Health (OIE). For the period July 2009 to June 2010, 97 countries reported virulent Newcastle disease either as outbreaks, clinical disease, or are considered endemic countries. For 2010, 18 countries in Asia, Africa and Europe (Bangladesh, Bhuthan, Bulgaria, Cambodia, China, Egypt, Hong Kong, India, Indonesia, Israel, Laos, Myanmar, Mongolia, Nepal, Romania, Russia, Spain, and Vietnam) reported outbreaks of high pathogenicity avian influenza; all as H5N1 subtype of the A/chicken/Guangdong/1996 lineage, except an H7N7 outbreak in Spain. Five countries reported incidence of H5 or H7 low pathogenicity avian influenza in 2010: 1) Denmark, H7N7, mallards for release, 4000 destroyed. 2) France, H5N3, foie gras ducks, 9000 destroyed. 3) Netherlands, H7N4, free range layers; 28,000 destroyed. 4) S. Korea, H5N6, commercial ducks; 23,400 destroyed; H7N7, LBM chickens and ducks, destroyed 3274; H7N7, commercial ducks; 86,000 destroyed. 5) Taiwan, H5N2, broilers (90,000) and layers (18,000); quarantined and retested until virus isolation negative, broilers sent to slaughters, layers released from quarantine.

Five outbreaks of pandemic H1N1 influenza A virus have been reported in turkey breeder farms, all showing decrease in egg production: 1) Chile, August 2009. 2) Canada, September 2009. 3) USA, Virginia, November 2009. 4) France, January 2010. 5) USA, California, February 2010.

Since July of 2010, outbreaks of NDV have occurred in double crested cormorants in Minnesota, North Dakota, Wisconsin, and Maryland. Sequencing of vvNDV's from Colombia and Venezuela isolated in 2008-09 indicated that these viruses are related to highly virulent Chinese and South African goose NDV of genotype VII. This is the first report of this genotype in South America.

The 8th International Symposium on Avian Influenza will be held at the Royal Holloway, University of London, U.K., 1-4 April, 2012. The Proceeding of the 7th Symposium have been published in *Avian Diseases*, 54(1) (Supplemental Issue), 2010. The 1st International Avian Respiratory Disease Conference will be held at the University of Georgia, Athens, GA, USA, May 15-18, 2011. This meeting is being organized by Patti Miller, Mark Jackwood, John Smith, and Ruud Hein. It will focus on avian coronaviruses, avian paramyxoviruses and laryngotracheitis (LT) virus. Note that work on avian influenza viruses will not be covered.

Broiler Annual Report

Deirdre Johnson
Gold-N-Plump Poultry

Mortality versus Bird Size: Of the three bird sizes (small = 3.6-4.4 lbs, middle = 5.2-6.0 lbs, large = >7.5 lbs), an increase was observed in the small and large bird categories. The increase in mortality, especially for the large bird category, could be due to the high temperatures this past summer.

7 Day Mortality: Seven day mortality increased across all categories and was highest amongst the middle bird category. This trend could be due to a decrease in egg pack quality (production demands) or hatchery conditions.

Condemnation: Condemnation numbers (whole birds plus parts) are down in the middle and large bird categories, but increased in the small bird category. This year the highest condemnation occurred in the large bird category, which trended different from previous years where the highest numbers occurred in the middle bird category.

Ranking of Disease Concerns: The disease concerns of nine poultry Veterinarians (33% of Association) from the AVBP (Association of Veterinarians in Broiler Production) are ranked below.

DISEASE	AVERAGE	MINIMUM	MAXIMUM
Legs	3.3	1	5
Paws	3.2	2	5
Inflammatory Process	3.2	1	4
Coccidiosis	3.0	2	5
Salmonella	3.0	1	5
Infectious Bronchitis	2.7	1	4
Infectious Laryngotracheitis	2.7	1	5
Wet Litter	2.7	1	5
Gangrenous Dermatitis	2.4	1	4
Breeder Flushing & Mortality	2.3	1	4
Round Worms	2.3	2	4

For musculoskeletal diseases of the legs, the two predominant diseases seen in the broiler industry are femoral head necrosis (osteomyelitis) and gastrocnemius tendon rupture (green leg). Femoral head necrosis has been associated with airsacculitis or enteritis challenges; however, poor nutrition and underlying bone strength can predispose birds to the condition. Ruptured tendons have increased in prevalence over the last several years. Early reovirus challenge results in the condition and an association with certain feed ingredients has been noted with an unknown pathogenesis.

Many companies still export graded paws. Paws also serve as an animal indicator of litter conditions and overall house environment. The PAACO broiler paw scoring system specifies guidelines to score paws for animal welfare. These guidelines differ from the quality grading guidelines used in the plant.

Inflammatory process continues to be a health problem for broilers in the United States. Possible etiologies include increased density (placement as well as migration), decreased feed availability, poor litter conditions, increased bird activity, excitatory lighting programs, poor feathering, and possibly antibiotic-free rearing.

Coccidiosis always remains a concern for the broiler industry. The clinical and subclinical disease costs the industry a tremendous amount of money. Over the past several years, the industry's use of coccidia vaccines has increased due mostly to side effects associated with ionophores. Eimeria maxima control helps limit the incidence of necrotic enteritis.

Ranking of Non-Disease Concerns: The disease concerns of nine poultry Veterinarians from the AVBP (Association of Veterinarians in Broiler Production) are ranked below.

NON-DISEASE	AVERAGE	MINIMUM	MAXIMUM
Food Safety Regulation	3.9	2	5
Antibiotic Use	3.8	1	5
Salmonella Standards	3.8	1	5
Fuel Costs	3.7	2	5
Export	3.3	2	5
Markets	3.3	2	5
Negative Media	3.3	2	5
Animal Welfare	3.2	1	5
Litter	3.2	2	4

Cap and Trade	3.0	1	5

The AVBP concentrated on two documents (comments submitted on both documents during public commenting period)

Compliance Guideline for Controlling Salmonella and Campylobacter in Poultry, Third Edition, May 2010, Docket No. FSIS-2009-0034: We support a scientifically verified approach to Salmonella control and request the decision making documents used to establish the new performance standards. Regulatory officials and industry representative alike have the same goal to provide a safe, wholesome product to the consumer. As an industry, we want to make sure that the current reduction measures and strategies are of value to our consumers.

Draft Guidance: The Judicious Use of Medically Important Antimicrobial drugs in Food-Producing Animal, Docket No. FDA-2010-D0094: From "Principle 1", the AVBP asks that the phrases "medically important" and "evidence that the use is linked to a specific etiologic agent" be further clarified. Since most of the compounds used to treat chickens have limited use in humans, we request explanation of the "medically important" antimicrobials. Due to the type of Veterinary medicine that poultry veterinarians practice, identifying the specific etiologic agent is not always possible. Many of the cases presented have multifactorial causes (disease complexes) and /or the underlying disease agent is unknown/untreatable. We also frequently utilize other tools to diagnose disease. These include collection of an adequate history, previous experience in the house or on that farm, as well as necropsy of a subset of birds from that house. Using these tools, we choose the appropriate treatment to prevent the exponential spread of the disease through the remainder of the house, often a time sensitive matter. Routine necropsy also serves as a tool to diagnose subclinical disease (birds with no clinical signs but still shedding infectious agent). By practicing population medicine, poultry veterinarians use this tool to treat the disease when in a low-grade status in order to prevent the disease from escalating into widespread clinical disease throughout the house or population (a.k.a. preventative health care).

From "Principle 2", we stated the current FDA regulation at the licensed feed mills and emphasized the shortage of food animal Veterinarians in United States. Again, as mentioned in the response to "Principle 1", a lack of "veterinary oversight" will translate into delayed treatment of infected animals and increased disease incidence/severity in the population depending on that time delay.

Broiler Industry Comments: The incidence of Salmonella has decreased in the broiler industry. Overall, the broilers in the U.S. are currently very healthy. This is partly due to the dedicated poultry veterinarians that apply scientifically based preventative disease measures (vaccination programs, gastrointestinal health programs, biosecurity programs, etc). Also, our ability to practice population medicine is greatly facilitated by the fact that our industry is fully integrated allowing veterinarians to apply these programs strategically for the benefit of the entire broiler population.

US Table Egg Industry Update

Eric Gingerich
Diamond V

US Table Egg Industry Update, October 2009 to October 2010 – Eric Gingerich, DVM

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 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, 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 the 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 and severity in their area of service on a scale of 1 to 4 with 1 = no problems, 2 = scattered problems, 3 = a common problem, and 4 = serious, widespread problems. The survey revealed the following diseases of concern occurring in US:

Ranking	Caged Pullets	Caged Layers	Cage-free Pullets	Cage-free Layers
1	Coccidiosis – 2.16	Colibacillosis and mites – tie 2.42	Coccidiosis – 2.60	Cannibalism – 3.08
2	Chick starveouts – 2.11		Chick starveouts – 2.40	Colibacillosis – 2.46
3	Chick yolk infections – 2.00	Cannibalism and calcium depletion – tie 2.26	Chick yolk infections, Ascarids – 2.20	Cocci – 2.38
4	Marek's – 1.95			Mites – 2.31
5	E. coli – 1.68	Focal duodenal necrosis and *Mycoplasma gallisepticum* (MG) – tie 2.00	Marek's – 2.00	Hysteria, Ascarids – 2.15
No. of Responses	19	19	10	13

The survey also asked about other issues and diseases of concern on a scale of 1 to 4 with 1 = low concern and 4 = very high concern. In the opinions of the 15 respondents, a high to very high level of concern was expressed for 1) banning of cages (3.65), 2) the lack of effective treatments (3.45), 3) *Salmonella enteritidis* (SE) (3.50), and 4) welfare issues overall (3.16). A level of some concern to high concern was expressed for 1) avian influenza (AI) (2.30), 2) on-farm euthanasia of spent fowl (2.30), 3) beak trimming (2.15), 4) molting (2.15), 5) lack of effective vaccines (2.15), and 6) disposal of male chicks (2.15). The degree of concern for avian influenza has diminished for the past two years due to continued success in the live bird market program and the lack of finding high pathogenic AI in the Americas.

Colibacillosis is a problem mainly of young flocks with mortality rates of 0.5 to 4% per week starting shortly after housing can occur. 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, rose to prominence in cage layers in this years' survey. 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. Decontamination of pullet moving trucks and equipment may also be lacking especially if the equipment was used previously for spent fowl movement.

Calcium depletion is normally associated with low intake of calcium, phosphorus, and/or vitamin D3 especially early in production with low feed intakes.

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.

Focal duodenal necrosis (FDN) is felt 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, probiotics, prebiotics, and botanical products are being evaluated for their usefulness in prevention of FDN.

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. Vaccination of caged or cage-free pullets has met with challenges of high mortality due to poor uniformity of vaccine application and litter moisture in cage-free housing.

Marek's Disease was mentioned in the survey as being no problem to scattered in pullets. Increases in the HVT + Rispens vaccine's inability to provide full protection against clinical lesions should be expected over time as the Rispens vaccine was first introduced 18 years ago. HVT and SB-1 vaccines lasted only 10 years after they were introduced before serious problems started to appear.

Diseases under control and of low incidence are as follows: infectious laryngotracheitis (ILT), 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. 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 facilities. 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) seen in northern California in Dec08 and May09 have not shown a recurrence of the disease.

Poultry welfare concerns continue to be of high to very high concern due to continued activities by activist groups. The full interpretation of the passed and HSUS-backed ballot initiative of 2008 in California is not yet known. One egg producer has built and populated an enriched cage facility in the hope that enriched cages will satisfy the law after interpreted. After Ohio established its Livestock Care Board by ballot initiative in 2009, the Humane Society of the United States (HSUS) threatened a ballot initiative in November 2010 to force the Board to follow HSUS guidelines. In late June of 2010, to avoid losing the upcoming ballot initiative, the Ohio governor and Ohio Farm Bureau made an agreement with HSUS to not allow any further building of cage layer units but will allow present facilities to operate plus other appeasements. During the year, videos taken by undercover activists showed male chicks being ground live (staged) and rough handling of spent fowl being euthanized using CO2 carts.

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. Neomycin and oxytetracycline were removed from layer use this year. The lack of an anti-parasitic product for used in controlling ascarids, 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.

Concern for SE and its consequences is increasing due to the unknown effect of the FDA Egg Safety Rule and the heightened awareness given to the issue due to 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. The 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 are struggling to gear up to handle the increased testing load this requires. The procedures required by FDA for testing eggs are more sensitive and tedious than used presently and will require expenditures by the laboratories for equipment not required presently. Producers who have a flock that tests egg positive and do not have a pasteurization or hard-cooking plant that will take their eggs are in a dilemma as to what to do with that flock. In addition, the producer faces a dilemma as to what to do when a manure positive swab is found; hold all eggs from the time eggs are collected for testing or risk a recall of product should it test positive after 10+ days required now for running the egg test using FDA BAM methodology. The industry is awaiting the use of PCR based tests that can cut the time required for testing to 48 hours. 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.

AI has fallen from very high concern to a high concern. Active and passive surveillance programs are continue across the US 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 a 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 NJ Departments of Agriculture and USDA to reduce the positivity of the live bird markets from 60% positive markets in 2004 to near zero since. No significant AI isolations have been made in layer flocks in the US 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 good profits for the last year. Some price drop was seen due to the egg recall and higher bird numbers this last summer. Egg prices responded nicely in the fall however due likely in part to disposal of hens involved in the egg recall. Feed prices have risen this fall due to poor yields across the Corn Belt and competition from the ethanol industry and exports of corn and soybeans.

Current Health and Industry Issues Facing the Turkey Industry

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In preparation for this report to the USAHA Committee on the Transmissible Diseases of Poultry & Other Avian Species, the subcommittee chairman, Dr. Clark, and turkey industry colleagues, Drs. Pyle and Thesmar, a majority of the US turkey industry professionals and veterinarians involved in turkey production, responded to a survey about the health status of turkeys produced in August 2009 through August 2010. The turkey industry reports several disease challenges for this 12 months varying by geographical 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 2010 are efficacious drugs, cellulitis, turkey coronavirus, blackhead, MS and FDA issues.

The "**lack of approved efficacious drugs**" continues to be the top disease issue ranked in 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 **colibacillosis** (ranked #3, unchanged from prior year), or **fowl cholera** (ranked #15 from #9). 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 increased to a score of 4.0 (from 3.8 in prior year) and ranked #2 (no change), from 3.3 (#3) and 3.1 (#5) in 2008 and 2007, respectively. Analysis indicates range of concern; 69% of respondents score CD a 4 or 5 (severe), 13% score it a 2 or 1 (mild). CD is most commonly seen in, but not limited to, commercial male turkeys nearing market age. The prevalence and severity of CD continues to increase. Veterinarians reply that the occurrence is confirmed at younger ages and in both toms and hens. *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.

Poult enteritis of unknown etiologies has decreased in importance, to position #7 from #4, with a score of 2.9 (from 3.3). **Turkey Coronavirus** (TCV), as a defined cause of enteritis, was ranked #25 (Table 1), increasing from #32, with 91 reported cases (Table 2). The majority of cases represented 2 separate outbreaks from 2 geographically distinct areas.

Late mortality ranked fourth (#4) health issue and increased from #5 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 (#5, prior year was #6) 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.

Blackhead, also known as Histomoniasis, increased to position #13 in 2010 (#11, 2009; #16, 2008; #22, 2007). It is one disease with no efficacious drug approved for use in turkeys. There were 91 reported cases of blackhead (Table 2) representing a 36% increase from 2009. 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, but were taken away from the poultry industry due to misuse in another industry.

Heat stress ranked #6 following a hot summer, compared to #16 the prior year. Poult Enteritis Mortality Syndrome (**PEMS** ranked #33 versus #25 previously), Ornithobacterium rhinotracheale (**ORT**, ranked #16 versus #10 previously) and **protozoal enteritis** (#22 versus #15) all decreased in ranking on this year's survey. Avian Metapneumovirus (**AmPV**) ranked #34.

Mycoplasma synoviae (**MS**, infectious synovitis) infections, ranked #28 (#27, prior year), are one cause of synovitis. It may be present in flocks 10-12 weeks of age with typically low mortality and low morbidity. There were 56 cases of MS reported (Table 2) representing a 47% increase from the prior year. The primary breeders have remained free of M. gallisepticum (**MG**), M. meleagridis (**MM**) and 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 US 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 [111th Congress] Preservation of Antibiotics for Medical Treatment Act of 2009, introduced into both the House and Senate [H.R.1549.IH; S.619.IS], otherwise known as PAMTA 2009. The turkey industry opposes PAMTA 2009, 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 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 2010 was addressing issues with veterinary oversight and antimicrobial use in food production animals. The Food and Drug Administration Center for Veterinary Medicine published two documents related to these issues. The first was an advance notice of proposed rulemaking for the Veterinary Feed Directive (Docket FDA-2010-N-1055). Second, the agency solicited public comments on a broad policy statement entitled Draft Guidance #209, "The Judicious Use of Medically Important Antimicrobial Drugs in Food-Producing Animals" (Docket FDA-2010-D0094). The Draft Guidance is the agency's response regarding antibiotics in food animals and how it possibly relates to antibiotic resistance in humans. The agency's intent is to evaluate judicious use and veterinary oversight of antimicrobial drugs in food-producing, particularly those with deemed medically important in human medicine. Guidance #209 is considered high level policy document regarding antimicrobial drugs, in particular those used for growth promotion and feed efficiency. NTF, AVTP, American Association of Avian Pathologists, American Veterinary Medical Association and numerous individual colleagues submitted comments on both documents offering solutions that would help protect the health of turkeys. Protection of the few drugs approved for use in turkeys was a key concern of individuals responsible for the health of the birds.

In 2010 the turkey industry has had more frequent problems with green livers and suspect osteomyelitis (TOC, Turkey Osteomyelitis Complex) in processing plants. Osteomyelitis ranked position #18 in 2010. Several plants have had unnecessary inspection action due to this issue. We are not sure if it is increased incidence of TOC, poor correlation among TOC inspection, or the case that green liver discoloration is no longer strongly associated with TOC.

In 2009, turkey production decreased to 7,149.94 from 7922.09 million pounds (live weight) in 2008. This was the lowest production level since 2005. Overall domestic per capita consumption for turkey products decreased to 16.90 lbs in 2009 from 17.60 lbs in 2008. The preliminary number for 2010 is 15.90 lbs turkey consumption per capita, which is the lowest level since 1989. Production in 2009 decreased to 247.359 million head with an average live weight of 28.91 lbs. In 2008, 273.008 million head were produced with an average live weight of 29.01 lbs. In general, in addition to decreases in flock sizes, birds were marketed earlier on average. (Reference: National Turkey Federation Sourcebook, June 2010)

Table 1. Turkey health survey (September) of US veterinarians in turkey production ranking current disease issues (1= no issue to 5 = severe problem). Survey response (reply) is 100% (n=25).

Issue	Score Average (1-5)	Score Mode (1-5)
Lack of approved, efficacious drugs	4.6	5.0
Clostridial Dermatitis (Cellulitis)	4.0	5.0
Colibacillosis	3.3	3.0

Late Mortality	3.2	4.0
Leg Problems	3.1	3.0
Heat stress	2.9	2.0
Poult Enteritis of unknown etiologies	2.9	3.0
Bordetella avium	2.7	4.0
Breast Blisters and Breast Buttons	2.6	3.0
Salmonella	2.6	3.0
Shaky Leg Syndrome	2.6	2.0
Tibial Dyschondroplasia (TDC, Osteochondrosis)	2.5	2.0
Blackhead (Histomoniasis)	2.5	2.0
Cannibalism	2.5	3.0
Cholera	2.4	3.0
Ornithobacterium rhinotracheale (ORT)	2.4	3.0
Fractures	2.4	2.0
Osteomyelitis (OM)	2.3	2.0
Round Worms (Ascaridia dissimilis)	2.3	2.0
Mycoplasma iowae (MI)	2.3	1.0
Coccidiosis	2.1	1.0
Protozoal Enteritis	2.0	2.0
H3N2 Swine influenza	2.0	1.0
Newcastle Disease Virus (NDV)	1.9	1.0
Turkey Coronavirus	1.9	1.0
Bleeders	1.9	1.0
Avian Influenza	1.8	1.0
Mycoplasma synoviae (MS)	1.6	1.0
Spondylolisthesis (Kinky-Back)	1.6	1.0
Erysipelas	1.5	1.0
Necrotic enteritis	1.4	1.0
Mycoplasma gallisepticum (MG)	1.4	1.0
PEMS (Poult Enteritis Mortality Syndrome)	1.4	1.0
Avian Metapneumovirus	1.2	1.0

Table 2. Turkey health survey (September) of US veterinarians in turkey production. Survey response (reply) is 100% (n=25).

	2010	**2009**	**2008**	**2007**
Cases (##) of Blackhead (Histomoniasis)	108	67	63	68
Cases (##) of *Mycoplasma synoviae* (MS)	56	38	47	52
Cases (##) of Turkey Coronavirus (TCV)	91	3	10	n/a

Update on the US Poultry & Egg Association Research Grants Program

Henry Marks
US Poultry 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 Harold E. Ford Foundation investments. The Research Advisory Committee (RAC) reviewed 42 research proposals with 7 of the research proposals receiving approval by the Foundation Board of Directors. A total of $339,560.00 was granted in support of 3 disease, 3 production, and 1 environmental project. Plans are to return to having two competitions in 2011 (spring and fall).

Pre-proposals for the 2011 Spring competition were received in November. The Research Advisory Committee requested full proposals from 39 individuals submitting preproposals. February 1, 2011 is the due date for receiving full proposals. May 1 and October 1 have been established as permanent research project preproposal due dates. Plans are underway to develop additional funding to support research efforts of the Harold E. Ford Foundation.

The following is an overview/summary of the U. S. Poultry & Egg Association Research Grants Program:

Table 1: US Poultry Research Grant Payments by Fiscal Year

1969	$16,000	1980	$48,982	1991	$571,935	2001	$1,302,824
1970	$9,500	1981	$40,871	1992	$759,002	2002	$1,159,493
1971	$18,043	1982	$73,395	1993	$791,879	2003	$1,069,800
1972	$14,577	1983	$109,132	1994	$889,116	2004	$1,046,438
1973	$10,500	1984	$488,040	1995	$948,187	2005	$1,024,974
1974	$9,590	1985	$311,186	1996	$1,072,950	2006	$819,811
1975	$18,077	1986	$224,226	1997	$1,045,102	2007	$851,938
1976	$15,590	1987	$432,530	1998	$1,180,070	2008	$1,015,338
1977	$6,600	1988	$1,455,775	1999	$1,078,901	2009	$318,535
1978	$16,500	1989	$706,802	2000	$1,049,219	2010	$339,560
1979	$29,500	1990	$591,905			2011	$325,093
						(6mos)	

Table 2: Institutions receiving US Poultry grants

ABC Research	University of Kentucky	Texas A&M University
New York University	Georgia Poultry Lab	University of Pennsylvania
University of Connecticut	Protein Sciences Corporation	Louisiana State University
Auburn University	University of Maine	Texas Tech University
North Carolina State University	Georgia Tech	University of Saskatchewan
University of Delaware	Purdue University	Loyola College of Maryland
Clemson University	University of Maryland	University of Arizona
North Dakota State University	Illinois Inst. of Technology	University of Wisconsin
University of Florida	Russell Research Lab	Michigan State University
Colorado Quality Rsch	University of Minnesota	University of Arkansas
Ohio State University	Iowa State University	USDA-ARS
University of Georgia	Southeast Poultry Research Lab	Mississippi State University
Cornell University	University of Missouri	University of California, Davis
Pennsylvania State University	Johns Hopkins University	Virginia Tech
University of Illinois	Southern Illinois University	Montana State University
Drew University	University of Nebraska	Washington State University
Praxis Biologics	Kansas State University	

Table 3: US Poultry research grants by general subject

Diseases	$8,786,942
Food Safety	$3,576,700
Poultry Production	$4,034,574

Litter/Waste Management	$2,950,014
Further Processing	$1,011,000
Processing	$821,722
Poultry Nutrition	$655,000
Egg-related	$783,560
Miscellaneous	$455,000
Egg Cholesterol	$155,000
Worker Health	$62,000
Total Approximately	$23,291,512

Update on the National List of Reportable Animal Diseases (NLRAD) Report

Ellen Kasari,
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The NLRAD is being developed in response to the 2007 USAHA Resolution # 9 that requested a national list of reportable animal diseases be developed, and the 2008 USAHA Resolution #10 that tasked the NAHRS Steering committee and Veterinary Services with the development of the national list of animal diseases, including case definitions and reporting criteria for each disease. In response, the National Animal Health Reporting System (NAHRS) Steering Committee, in cooperation with Veterinary Services drafted a NLRAD overview document and a proposed list of reportable animal diseases in 2009. The drafted NLRAD is based on the OIE list of animal diseases. In 2010, the NLRAD overview document and disease list were revised and redistributed to the NAHRS steering committee. An update on the NLRAD was shared with the Veterinary Services Management Team in October 2010 and their comments will be addressed in an upcoming revision. Commodity group, NASAHO, and other stakeholder review and input are either actively being sought, or are planned in the near future. A brief overview of the definitions “Notifiable” and “Monitored” have been provided along with a list of proposed NLRAD diseases that impact Poultry. Comments about the NLRAD from the Committee on Transmissible Diseases of Poultry and other Avian Species should be directed to the NAHRS Steering committee’s Poultry Working Group Chair, Dr. Bruce Stewart Brown. Support for a resolution by the Committee on Animal Health Surveillance and Information Systems for continued support of the NLRAD development is requested.

National Poultry Improvement Plan Annual Report

Steve Roney
USDA-APHIS-VS

National Poultry Improvement Plan is a Federal-State-Industry cooperative program. There are 49 Official State Agencies and 126 Authorized Laboratories. Official NPIP disease monitoring classifications include: U.S. Pullorum Typhoid Clean, U.S. Mycoplasma Gallisepticum Clean & Monitored, U.S. Mycoplasma Synoviae Clean & Monitored, U.S. Mycoplasma Meleagridis Clean, U.S. Salmonella Enteritidis Clean, U.S. Sanitation Monitored, U.S. Salmonella Monitored, U.S. Avian Influenza Clean, and U.S. H5/H7 Avian Influenza Clean for poultry breeding flocks; and U.S. H5/H7 Avian Influenza Monitored for commercial (production) poultry flocks.

Pullorum-Typhoid Status: In FY 2010(July 2009-June 2010) there were no isolations of *Salmonella pullorum* in the US. There were no isolation/outbreaks of *Salmonella pullorum* (standard strain) reported during calendar year 2009 and one isolation in calendar year 2008. There have been no isolations of *Salmonella gallinarum* since 1988 in any type poultry. U.S. Pullorum-Typhoid Clean participating hatcheries include: 283 egg and meat-type chicken hatcheries, 40 turkey hatcheries, and 790 waterfowl, exhibition poultry and game bird hatcheries.

NPIP U.S.Pullorum-Typhoid Clean Participating Breeding Flocks and Number of Birds are listed below:

- **Egg-Type Chickens:** 203 Flocks with 3,562,748 birds
- **Meat-Type Chickens:** 5,575 Flocks with 83,278,808 birds
- **Turkeys:** 824 Flocks with 6,789,659 birds
- **Waterfowl, Exhibition Poultry, and Game Birds:** 2975 Flocks with 1,345,462 birds

Avian Influenza Status: In FY 2010 (July 1, 2009-June 30, 2010), there was an H7N9 isolated in turkeys in MN, an H7N3 from a game bird farm in NJ and an H5N2 antibody detection from a pet chicken in WA.

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:

Subpart	Flocks	Birds	Tests
Egg-Type Chicken Breeders	203	3,562,748	35,939
Table-Egg Layers	3,151	237,208,212	176,323
Meat-Type Chicken Breeders	5,575	83,278,808	190,448
Meat-Type Chickens Commercial	103,230	8,356,682,478	1,398,892
Turkey Breeders	824	6,789,659	32,066
Meat-Type Turkeys	13,891	144,027,275	139,315
Waterfowl, Upland Gamebirds, Ex. Poultry	5,011	12,554,859	72,816
Total	131,885	8,844,104,207	2,045,799

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. Demand for this is increasing yearly. 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 2010.

NVSL Avian Influenza and NewCastle Disease Activities Report, FY 2010

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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 4,283 specimens in 624 submissions from 10 states (CA, CT, FL, MA, NJ, NY, OH, PA, RI, and TX) by virus isolation in embryonating chicken eggs. The surveillance is a collaborative effort between individual States and the United States Department of Agriculture. With the exception of NJ, only specimens submitted to the NVSL as presumptive positive specimens detected at the State level, are reported here.

In FY 2010, AIV or APMV was isolated from 12% (72 of 624) of submissions and 3.1% (133 of 4283) of specimens tested. AIV subtype H3N1 (PA, n=4) and H6N8 (FL, n=6, PA, n=1) were the most common subtypes found in the LBMS this year. Other subtypes of AIV isolated from the states where the specimens originated, and the number of isolations were: H10N2 (FL, n=3), H4N6 (PA, n=2), H5N2 (PA, n=1), H6N2 (OH, n=1, TX (n=1), H6N4 (NJ, n=1). The remaining 113 viruses isolated were identified as APMV; 102 were APMV-1 from 6 states (FL, NJ, PA, RI, TX, NY), and 9 were identified as pigeon paramyxovirus type-1 (PPMV-1) from NJ and PA. Pathogenicity of representative APMV-1 isolates was determined by the intracerebral pathogenicity index (ICPI, n=24) test and/or by analysis of the deduced amino acid profile at the fusion protein cleavage site (n=65). All but 9 isolates were characterized as low virulent (lentogenic pathotype) strains; the 9 isolates were characterized as pigeon paramyxovirus type-1 (PPMV-1), a pigeon-adapted variant of Newcastle disease virus. In addition, an APMV-3 was identified in one specimen from FL, and an APMV-8 was identified from one specimen from NJ.

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 testing of positive specimens. An AIV subtype H7N3 was isolated from specimens received from a preserve/breeding farm in Salem County, NJ. This flock was raised for on-premises hunting (no meat consumption), and was not linked or related to any commercial poultry operations or the LBM. The H7 AIV was pathotyped as low pathogenicity avian influenza (LPAI) virus by the chicken pathogenicity test and amino acid sequence analysis of the hemagglutinin (H) cleavage site. During FY 10, no detections of notifiable LPAI (LPNAI) in commercial poultry were reported to the World Organization for Animal Health (OIE). Pandemic H1N1 (pH1N1) was detected in commercial turkeys in 2 states, VA and CA. For VA, 6 flocks infected with pH1N1 experienced a significant drop in egg production (10 – 68%) following insemination, but no other clinical symptoms were present. Sequence analysis for the H, neuraminidase (NA), and matrix (M) genes was conducted. The VA detection is the first confirmed case of pH1N1 influenza virus infection in a commercial turkey breeder flock in the U.S. following presumptive human to turkey transmission. The detection in CA represented two turkey flocks in Merced County, CA with a drop in egg production. No mortality or clinical signs were reported. Sequence analysis was conducted on the HA, NA and M genes.

The NVSL received 506 submissions from commercial and backyard poultry for AI antibody confirmation and subtyping in FY10. NVSL detected influenza H1, H3, N1, and/or N2 antibodies in 352 commercial turkey submissions from 10 states (IA, MI, MN, NE, NC, OH, PA, SD, WI, and VA) in FY10. Detection of additional LPAI AIV or AIV-specific antibodies in poultry/birds is shown in Table 1.

AI Diagnostic Reagents Supplied by the NVSL. During FY 2010, a total of 14,810 units of AGID reagents (antigen and enhancement serum) were shipped to 77 state, university, and private laboratories in 39 states. The quantity is sufficient for approximately 1,777,200 AGID tests. An additional 256 units (30,720 tests) were shipped to 8 foreign laboratories.

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 2010, PTs were distributed to 277 diagnosticians in 58 laboratories for AI and APMV-1 (Newcastle disease) rRT-PCR. The AI rRT-PCR proficiency panel was increased from 10 specimens to 15 and included specimens for the detection of swine influenza, specifically pH1N1.

AIV Surveillance in Wild Waterfowl. In 2010, waterfowl surveillance for highly pathogenic notifiable H5N1 in Alaska and the lower 48 states continued. The surveillance is a cooperative effort of USDA's Animal and Plant Health Inspection Service (APHIS, NVSL), Wildlife Services (WS, National Wildlife Research Center, Fort Collins, CO) and the Department of Interior's United States Geological Survey (USGS, National Wildlife Health Center, Madison, WI). Specimens collected from wild-caught and hunter-killed waterfowl were screened by rRT-PCR for AIV specific RNA at National Animal Health Laboratory Network (NAHLN) laboratories and the USGS laboratory in Madison, WI. Specimens collected from mortality events were tested at the USGS and NVSL laboratories. All presumptive H5 and H7 positive specimens were submitted to the NVSL for confirmation and virus isolation. For

the 2010 wild bird surveillance biological year, 897 presumptive positive specimens were received for confirmation testing. No HPNAI H5N1 was detected; however, LPAI H5N1 virus was detected in specimens submitted from 3 states (MD, OH and WI). A total of 61 H5 viruses (various N subtypes) from 18 states and 44 H7 viruses (various N subtypes) from 15 states were isolated. All H5 and H7 AIVs were characterized as LPAI viruses of North American lineage. Other AIV subtypes isolated included H1, H2, H3, H4, H6, H10, and H11. Details of the wild bird surveillance will be reported separately.

NewCastle Disease

Isolations of Virulent Newcastle Disease Virus (vNDV). In FY 2010, no vNDV was isolated from domestic poultry. However, vNDV was isolated from one lot of Blue-bellied Rollers and Barbets imported through a quarantine facility in California, and pigeon paramyxovirus type-1 (PPMV-1) was isolated from 11 pigeons in 6 states (GA, MT, NY, OH, PA, and TX). In addition, vNDV was isolated from wild cormorant specimens from DE, IL, NH, MA, and MN. 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 2010, 36 isolates of APMV-1 were received for characterization at the NVSL or were isolated at the NVSL from diagnostic submissions. The specimens originated from 6 states (CA, MN, NC, PA, TX, and WI). All of the isolates were characterized as LoNDV by the ICPI and/or by deduced amino acid motif at the fusion protein cleavage site.

Table 1. Subtypes of non H5 or H7 low pathogenicity avian influenza virus (AIV) or specific antibodies detected in poultry/birds, FY 2010.

State	Species	Subtype of AIV* (number)	Antibody Subtypes (number)
Washington	Chicken		H5N2 (2)
Pennsylvania	Turkey		H9N2 (21)
Pennsylvania	Chicken		H1,3,6 N1,4 (1)
Texas	Chicken/Turkey		H3,6N2 (24)
Alaska	Loon		N2,N4 (1)
Florida[a]	Swan		H3,5 N2,7 (1)
Maryland	Wild turkey		H3N2,8 (1)
Pennsylvania	Muscovy Duck	H5N2** (1)	
California	Turkey	pH1N1 (7)	
Virginia	Turkey	pH1N1 (10)	
Pennsylvania	Quail	H4N6* (2)	
Pennsylvania	Turkey	H1N1* (2)	
Texas	Chicken	H4N6* (7), H6N2* (2)	
Oregan	Game birds	H3N8* (2)	

*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.

[a]Zoological garden

National Veterinary Services Laboratories Update: *Salmonella, Pasteurella* and *Mycoplasma* from Poultry

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***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 January 1 through December 31, 2009 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 January 1 to December 31, 2009 there were 4,761 isolates from chicken sources and 1,155 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 2010 test included *Salmonella* serotypes *enteritidis, kentucky, berta, heidelberg, Escherichia coli*, *E. coli* (H_2S+), *Pseudomonas aeruginosa*, and *Proteus mirabilis*. The test consisted of 5 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 2009: Chicken

Clinical		**Non-Clinical**	
Serotype	**No. Isolates**	**Serotype**	**No. Isolates**
enteriditis	49	enteritidis	944
heidelberg	20	kentucky	930
kentucky	15	heidelberg	633
senftenberg	13	senftenberg	180
typhimurium	9	mbandaka	145
All others	48	montevideo	119
		schwarzengrund	90
		typhimurium	82
		anatum	60
		berta	59
		All others	1365
Total	**154**	**Total**	**4607**

Table 2: Most common serotypes in 2009: Turkeys

Clinical		**Non-Clinical**	
Serotype	**No. Isolates**	**Serotype**	**No. Isolates**
senftenberg	46	senftenberg	170
ouakam	16	hadar	132
montevideo	15	worthington	107
heidelberg	15	muenster	61

hadar	14	saintpaul	48
All others	92	london	45
		agona	35
		albany	28
		schwarzengrund	25
		montevideo	21
		All others	285
Total	**198**	**Total**	**957**

Table 3: Summary of the NVSL *Salmonella* proficiency test

	2009	**2010**
Participants	40	55
Mean Score	93%	92%
Score Range	100-44%	100-44%
Below Passing	4	3

Salmonella enteritidis

The number of *Salmonella enteritidis* (SE) isolates submitted from chickens in 2009 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.

Table 4: Number of chickens *Salmonella enteritidis* isolates per calendar year at the NVSL

	2005	**2006**	**2007**	**2008**	**2009**
No. chicken isolates	6236	4579	4971	6164	4761
No. chicken SE isolates	424	437	580	876	993
SE percent of all isolates	6.8%	9.5%	11.7%	14.2%	20.9%

Table 5: Most common *Salmonella enteritidis* phage types from chicken sources per calendar year

Rank	**2005**	**2006**	**2007**	**2008**	**2009**
1	13 (98)	8 (156)	8 (103)	8 (240)	8 (131)
2	8 (80)	13 (96)	13 (29)	13 (82)	13 (54)
3	22 (14)	23 (16)	23(16)	23 (58)	13a (19)
4	13a (13)	4 (12)	13a (15)	13a (43)	23 (10)
5	23 (9)	13a (8)	22 (1)	RDNC (10)	RDNC (4)
Total typed	223	297	167	444	228

( ) = number of isolates for each phage type
RDNC = reacts, does not conform

Salmonella pullorum

The NVSL provided 485 ml of *S. pullorum* tube antigen, 1,075 ml of *S. pullorum* stained microtiter antigen, and 73 ml of antisera to testing laboratories. The NVSL conducted 136 *S. pullorum* microtiter tests. The NVSL did not identify any isolates of *S*. *pullorum* via serotyping in 2009.

Pasteurella* and *Mycoplasma

NVSL received 160 isolates for somatic typing in 2010, a slight decrease from 2009 (Table 6). NVSL also supplied 40 ml of *P. multocida* typing sera, a decrease from 159 ml in 2008.

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.

	2008	**2009**	**2010**
Type 3	46	54	38

Type 3,4	39	33	27
Type 1	33	14	25
All other	80	62	70
TOTAL	**198**	**163**	**160**

Table 7: *Mycoplasma* antisera (ml) provided by NVSL per fiscal year

Antisera	2006	2007	2008	2009	2010
M. gallisepticum	330	374	340	266	256
M. meleagridis	46	74	120	54	32
M. synoviae	402	342	346	222	256
Negative	168	136	252	162	222
Total	946	926	1058	704	766

Table 8: *Mycoplasma* antigen (ml) provided by NVSL per fiscal year

Antigen	2006	2007	2008	2009	2010
M. gallisepticum	490	515	390	190	150
M. meleagridis	90	120	150	75	75
M. synoviae	605	610	510	200	215
Total	1185	1245	1050	465	440

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2010 Live Bird Marketing System (LBMS) Notifiable Avian Influenza (NAI) Program Working Group Report

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In October 2004, the Animal and Plant Health Inspection Service (APHIS) Veterinary Services (VS) published Uniform Standards for NAI Prevention and Control in the LBMS to establish a more consistent approach by participating States in the control of NAI in the LBMS. In August 2008, VS published an updated edition of the Uniform Standards, which includes a new section on General Criteria for Indemnification of H5/H7 Low Pathogenicity Avian Influenza (LPAI) in the LBMS.

State participation is voluntary. Participating States will enact regulations for compliance of their live bird markets (LBMs), producers, and distributors. All LBMs, producers, and distributors that supply the retail markets must be registered or licensed with the State and allow Federal and State inspectors access to their facilities, birds, and records. These facilities must also have written biosecurity protocols in place. APHIS coordinates and administers the program. APHIS provides field and laboratory personnel and resources to assist States with implementation and compliance with program requirements.

In February 2010, the annual LBM Working Group business meeting was held in Miami, Florida, to address the LBMS NAI Prevention and Control program concerns. More than 55 participants attended the meeting including APHIS field, regional, and headquarters staff; State Department of Agriculture representatives; and LBMS industry stakeholders. Participants discussed the program's progress, shared ideas for continued program development, and agreed on further implementation of the program.

In addition, the working group discussed (1) updates on the 2010 NAI consolidated work plans and cooperative agreements; (2) the procedural format for NAI Situation reports and Epidemiology reports; and (3) critical information needs on NAI findings in the LBMS for international reporting. Special presentations were given on: the Micro-tag project in Pennsylvania to look at individual bird identification, the Miami import station, an urban poultry survey in Colorado, a backyard poultry survey in Georgia, and the 2010 National Animal Health Monitoring System poultry study. Several States presented their program accomplishment reports. Further, the Agricultural Research Service and National Veterinary Services Laboratories discussed AI research and diagnostic updates. The working group also learned more about the game bird industry, which supplies many game bird species to retail LBMs.

The annual LBMS continuing education training workshop was held at the University of Minnesota, College of Veterinary Medicine, Minneapolis and Saint Paul, in August 2010. Of the 59 registrants, 48 were either State or Federal personnel (from 21 States and Territories) and 11 were international participants from 10 countries representing Barbados, Costa Rica, the Dominican Republic, Grenada, Guatemala, Montserrat, Panama, El Salvador, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago.

The workshop equips regulatory personnel with the basic information and skills for LBMS NAI surveillance activities. The agenda included the different components of the LBMS, poultry respiratory disease, collecting samples, biosecurity and disease risks in various segments of the LBMS, tools for evaluating risk, and education and outreach of information on mitigation techniques. The training also included field trips to evaluate biosecurity and records auditing at a Hmong LBM and the Minnesota State Fair to conduct an emergency scenario exercise.

In fiscal year (FY) 2010, surveillance in the LBMS was a high priority. In FY 2009, 136,074 tests were performed in the LBMS surveillance program, and approximately 113,221 tests were conducted for AI surveillance in the LBMS for the first three quarters of FY 2010. Tests included agar gel immunodiffusion, real-time reverse-transcriptase polymerase chain reaction (rRT-PCR), antigen capture immunoassay, and virus isolation. For virus isolation and rRT-PCR, each sample may represent five individual swabs pooled for a composite single sample/test.

APHIS initiated cooperative agreements with 41 States and Territories in FY 2010 to conduct LBMS surveillance. In the Western Region, 18 States were awarded cooperative agreements (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Iowa, Kansas, Louisiana, Missouri, Montana, Nebraska, North Dakota, Oklahoma, Oregon, South Dakota, Texas, and Washington). In the Eastern Region, 23 States and 2 Territories were awarded cooperative agreements (Alabama, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Kentucky, Massachusetts, Maryland, Minnesota, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, West Virginia, Puerto Rico, and U.S. Virgin Islands).

Since the H5/H7 LPAI LBMS program was initiated in 2004, the number of LBMS positive premises has decreased steadily. FY2007 marked the successful eradication of the low pathogenicity H7N2 AI virus that had been circulating in the LBMS in the Northeast United States since 1994. The H7N2 virus has not been detected since April 2006. In FY 2008, 20 LBMS premises were found positive for NAI virus (all H5N2 with an exception of one H5N9). Three were in production flocks, 2 in auctions, and 15 in retail LBMs. Also in FY 2008, five backyard

premises were positive for NAI virus. In FY 2009, two LBMs were positive for NAI H5N2 virus, with one market testing positive three times. In FY2010, one LBMS premises was found positive for H5N2 NAI virus.

Update on the Early Detection for Highly Pathogenic Avian Influenza in Wild Migratory Birds

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In 2006, the U.S. Departments of Agriculture, Interior, and Health and Human Services, along with state and university cooperators developed and implemented the US Interagency Strategic Plan for An Early detection for HPAI in Wild Migratory Birds. After five years of implementation the threat of HPAI H5N1 introduction still remains, and has likely increased due to the continued evolution of the virus in domestic poultry and ducks, and wild birds. Establishing the wild bird early detection system was, and remains, an important component of the US pandemic influenza strategy. Prior to its establishment, no national level surveillance stream for influenza in wild birds existed.

The early detection system in wild birds is an effective, coordinated approach in which standardized protocols for sampling wild birds, and for testing and communicating results from those samples. Fifty state wildlife agencies and multiple tribal offices have collaboratively worked with the usda and doi in collecting over 344,400 wild bird samples through four strategies: morbidity and mortality events, live bird sampling, hunter harvest, and sentinel animals. Additionally 101,550 environmental fecal samples were collected and tested. Sampling was targeted toward highest risk locations and species throughout the us. Deliberto et al. (2009) published a completer review of the interagency strategy and results through 2009. The us effort was coordinated with similar efforts by Canada and Mexico, resulting in the largest and most successful animal disease surveillance system ever implemented.

In addition to providing a surveillance stream that can detect an introduction of HPAI in wild birds, the Early Detection System produced a number of ancillary benefits. These benefits include enhanced communication and collaboration of wildlife, agriculture, and public health agencies, as well as the agricultural and sport hunter industries. The establishment of a National Tissue archive by USDA at the Colorado State Veterinary Diagnostic Laboratory continues to provide benefits from previous surveillance activities by providing samples for development of new diagnostic techniques and analysis of other disease agents. Perhaps the most obvious benefits of the Early Detection System are its proven ability to detect other emerging disease events such as virulent Newcastle Disease, infectious bursal disease, Rift Valley fever, classical swine fever, tick-borne diseases, malignant catarrhal fever, salmonelosis, Johne's disease, brucellosis, mycoplasmosis, and infectious laryngotracheitis. The system also has improved our understanding of the ecology of LPAI in wild birds, which we are now using to improve our understanding of the risk to the poultry industry. Finally, the infrastructure developed for the Early Detection System has also improved preparedness to respond to disease outbreaks in domestic as well as wild species, as well as assisting the public by responding to emergencies such as the Deepwater Horizon Oil spill and natural disasters.

Unfortunately, reduced funding and a reprioritization of existing funds, will result in the elimination of the USDA's Early Detection System on 31 March 2011. Consequently, we have begun the process of reducing infrastructure including personnel and funding to state agencies and diagnostic labs. This reduction will not only terminate the Early Detection System, but will also dramatically reduce our capability to respond to future disease outbreaks.

Southeast Poultry Research Laboratory Research Update

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The Southeast Poultry Research Laboratory (SEPRL) does intramural research for the United States Department of Agriculture on several poultry diseases. Following are some of the research accomplishments from last year. In the area of influenza research, we demonstrated that laying turkey hens inoculated with the pandemic H1N1 virus can be infected by the intraoviduct route. This new route of transmission explained the introduction of the virus into turkey flocks through routine artificial insemination. Chicken layers became infected when inoculated by the intranasal, intracloacal or introviduct routes with a type H6N2 low pathogenic avian influenza (LPAI) virus, but not with a type H9N2 virus, indicating that LPAI viruses can also transmit in chickens through other routes besides the intranasal route; however this transmission depends on the virus. Canine influenza of the H3N8 subtype, which is endemic in the US, was shown to be nonpathogenic in chickens, turkeys and domestic ducks. Work continues with antigenic cartography to develop antigenic maps of the H5, H7 and H9 subtypes with chicken sera, which will greatly facilitate the selection of optimal vaccine seed strains. Studies on vaccination of ducks and geese against H5N1 HPAI were also done. A study using passively transferred antibodies to simulate maternal antibodies to avian influenza showed that maternal antibodies can negatively affect vaccination with both killed and live recombinant vaccines and that targeting the vaccine to the field strain was the best correlate of protection.

Newcastle disease research included studies evaluating the effectiveness of U.S. pasteurization standards for egg products to inactivate a low virulent NDV; the development and evaluation of two Newcastle disease virus (NDV) LaSota strain-based vaccine vectors expressing avian metapneumovirus subtype C (aMPV-C) virus glycoprotein (G) or fusion (F) and G proteins generated by reverse genetics; and a study evaluating egg production after virulent NDV challenge showing how its differentially affected by the genotype of the NDV vaccine.

Research on enteric viruses included the characterization of un-described viruses present in the turkey gut, a pyrosequencing platform to compile an RNA virus metagenome from turkeys experiencing enteric disease. Numerous viral sequences from the dsRNA viruses (Reoviridae and Picobirnaviruses), and the ssRNA viruses (Caliciviridae, Leviviridae, Picornavirales, and Astroviridae) were identified. RT-PCR tests were developed targeting the RdRp of a novel picobirnavirus and the non-structural polyprotein region of a novel calicivirus; these primers were used to identify turkey picobirnavirus and calicivirus RNA in United States turkey flocks with enteric disease signs.

Avian Disease and Oncology Laboratory (ADOL) Research Update

Aly Fadly, Hans Cheng, John Dunn, Mohammad Heidari, Henry Hunt,Lucy Lee, Robert Silva and Huanmin Zhang
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GENOMICS

To meet the growing demands of consumers, the poultry industry will need to continue to improve methods of selection in breeding programs for production and associated traits. One possible solution is genome-wide marker-assisted selection (GWMAS). In brief, evenly-spaced genetic markers spanning the entire genome are genotyped (scored) on individuals to estimate their breeding value, which in theory could substantially increase the rate of genetic gain compared to traditional selection methods. To test the power of GWMAS, meat-type and egg-type chicken lines are being selected in parallel using either traditional (BLUP) or GWMAS. This year, after completing two rounds of selection, we conclude that compared to birds selected in parallel using current state-of-the-art breeding methods, genomic selection is superior for the vast majority of the traits selected including body weight and breast yield. This research strongly suggests that genomic selection is an improved breeding method. If costs for genetic testing continue to go down, then poultry breeders should be able to economically breed chickens faster using genomic selection and adapt more readily to changing consumer demands. The economic impact could be great since with 1 million meat-type birds processed per hour in the US alone, the net effect of even small improvements are large and worth millions of dollars.

MAREK'S DISEASE

Diagnosis, Surveillance and Pathotyping: Marek's disease virus (MDV) strains with similar mutation were isolated from chicken farms in Pennsylvania in 2007 and 2010. Affected farms ranged from 13-28 miles apart; the case involved different bird strains, vaccine companies, and pullet farm and hatchery origins. The isolated MDV strains were typed as vv+, but not unusually virulent. Mutation affects specificity of T65 monoclonal antibody for differentiating field strains from Rispens. We also diagnosed MD early mortality syndrome in Connecticut backyard flock, demonstrating high potential virus load and need for vaccination even in backyard flocks. Peripheral neuropathy was also diagnosed in 6 week-old pullets in Ohio; the case involved low incidence of leg paralysis and the presence of lymphoplasmacytic neuritis and edema.

Immunogenetics: Understanding the relationship between host genetics and MD vaccine efficacy plays an important role in developing vaccination schemes for better control of the disease. Recently, chickens from two highly inbred lines (highly resistant and susceptible) and a series of 19 recombinant congenic strains were used to evaluate the protective efficacy of two commonly used MD vaccines and a candidate recombinant vaccine termed rMd5-Meq deleted vaccine. The protective indices of the vaccine ranked from high to low; the change in the ranking order of protective indices for two of the three vaccines between the two chicken lines indicated a vaccine X chicken line interaction affecting the vaccine protective efficacy.

Marek's disease virus immune evasion gene: MDVs retain the ability to evade immune recognition. Identifying and removing the viral genes that are responsible for virus immune evasion will produce a more effective vaccine. We have previously shown that MDV down-regulates MHC class I, a critical protein that signals the chicken's immune system there is a virus infection, however, the gene (s) involved have not been identified. Recently, we demonstrated that an MDV gene, termed MDV012 is capable of reducing surface expression of MHC class I on chicken cells. Our results suggest that this is the first non-mammalian MHC class I immune evasion gene identified, and that it is highly conserved in herpesviruses.

Cytokine and chemokine gene expression analysis in MDV infection: Through cytokine and chemokine gene expression analysis, we have discovered that vv+ strains of MDV drive the immune response to a Th-2 lineage and suppression of Th-1 immunity. Th1-type adaptive immune activity is critical for the induction of a successful host antiviral immune response. Global gene expression profiling has provided evidence that highly pathogenic strains of MDV induce severe and prolonged immune suppression by repression of the transcriptional activities of many genes that are critical components of both the innate and adaptive immune responses. Among the many immune response genes down regulated by MDV, adhesion molecules are of critical importance. Suppression of these cell surface receptors impedes the transmigration of leukocytes to the site of infection and inflammation.

Vaccines: Using cosmid clone and bacterial artificial chromosome (BAC) technologies, we have developed a recombinant MD vaccine virus where both copies of the Meq gene were deleted. Evaluation of this vaccine, termed rMd5-meq deleted vaccine under laboratory and field conditions revealed that the vaccine is efficacious and provided better protection than the most effective commercially available vaccines. Attempts are now being made to insert gB and gJ genes from infectious laryngotracheitis virus (ILTV) into our BAC- rMd5-meq-deletd virus; if successful this new vaccines should provide protection against both vv strains of MDV and ILTV.

AVIAN LEUKOSIS

Screening for recombinant avian leukosis viruses: Use of genetically resistant (restrictive) chicken embryo fibroblasts (CEFs) is essential for screening for subgroups of ALVs. In susceptible CEFs dually infected

with avian leukosis virus (ALV) subgroup A (ALV-A) and ALV-J, ALV-A appeared to be the dominant subgroup. Under these experimental conditions, dual infection of susceptible CEFs with ALV-A and ALV-J resulted only in either ALV-A, or ALV-J. No recombinant ALV such as ALV-A/J or ALV-J/A was detected. Use of PCR specific for envelope and LTR of subgroup of ALV following propagation on restrictive CEFs should be a useful tool in identifying recombinant ALVs, if present. Inability to detect recombination between ALV-A and ALV-J suggests that conditions used in the current experiment were not suitable for recombination. Factors that were not tested and should be considered such as multiplicity of infection, virus dose, strain and subgroup of virus

RETICULOENDOTHELIOSIS

Characterization of various reticuloendotheliosis virus (REV) isolates obtained from various species located in different geographical regions in the United States: Nine reticuloendotheliosis virus (REV) isolates obtained from broiler breeders, turkeys, and prairie chickens located in three different geographical regions in the USA, and three isolates obtained from known contaminated live-virus vaccines were characterized using polymerase chain reaction (PCR) and indirect immunofluoresence (IFA) assays. All isolates were propagated in chicken-embryo-fibroblasts (CEF) obtained from a specific-pathogen-free (SPF) breeder flock. Results from sub-typing indicated that all nine isolates from broiler breeders, turkeys, and prairie chickens belonged to subtype 3, and are antigenically related to the chick-***syncytial*** virus (CSV) strain of REV, the prototype of subtype 3 REV. In contrast, the three isolates from contaminated vaccines were classified as subtype 2, and antigenically related to spleen necrosis virus (SNV) strain of REV, the prototype of subtype 2 REV. Results from DNA sequence analysis confirmed those from sub-typing and indicated that the three REV isolates representing those from broiler breeders, turkeys, and prairie chickens are closely related to CSV of REV, with an amino acid homology of 98% or greater as compared to SNV with an amino acid homology of 95% or less. Data from this study clearly indicate that subtype 3 is the most common subtype of REV circulating in three different avian species, namely broiler breeders, turkeys and prairie chickens located in three different geographical regions in the United States.

H7N9 LPAI in Minnesota

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Summary – During 2009, H7N9 LPAI (Low Pathogenic Avian Influenza) was identified in commercial poultry flocks in four states (KY, TN, IL, MN). In Minnesota it was identified in commercial confinement turkey operations, with the index case confirmed May 14, 2009. Evidence of the virus was identified on eight premises in four counties (1,000,000 turkeys), where a total of eighty-nine (89) commercial confinement turkey flocks were exposed to or infected with H7N9 LPAI. The initial four premises involved independent turkey growers associated with an out-of-state processor (Area One). The last four premises (Area Two) were company owned farms located 60 miles from Area One with no direct company or epidemiological links. Within six (6) months of the initial introduction, all premises were depopulated via controlled marketing (87 flocks) or mass depopulation (2 flocks) per the Minnesota H5/H7 LPAI Initial State Response and Containment Plan (Minnesota Plan). All premises have been repopulated with no evidence of H7N9 LPAI infection.

State/Industry Response – The index flock was identified from pre-slaughter samples collected May 6, 2009. Samples collected from the flock (17 weeks of age) were Agar Gel Immunodiffusion (AGID) positive with no significant mortality or clinical signs at that time. After confirmation from the National Veterinary Services Laboratory (NVSL) May 14, 2009, the Minnesota Board of Animal Health (MBAH) in cooperation with the affected growers and Minnesota poultry industry implemented the Minnesota Plan, also known as the Initial State Response and Containment Plan (ISRCP). Approved by the United States Department of Agriculture Veterinary Services (USDA/VS), the Minnesota Plan is a written plan that details the response in the event of an H5 or H7 LPAI introduction in Minnesota. The initial response involved notification of the poultry industry through disease alerts, increased industry biosecurity and discussion of premises depopulation measures with Minnesota's Emergency Management Committee (EMC). In addition, increased active surveillance, movement restrictions and re-population surveillance were implemented as the event progressed. With limited clinical signs and mortality, 87 virus negative flocks were depopulated via controlled marketing at a Minnesota processing plant. Per the Provisions of the National Poultry Improvement Plan (NPIP), poultry moved for controlled marketing would not be eligible for indemnity under 9 Code of Federal Regulations (CFR) Part 56.3, but flock owners would be eligible for cleaning and disinfection indemnity costs. Two young flocks that were identified as exposed were mass depopulated via foaming. In-house composting was the method of carcass disposal for these two flocks. For Area One, an Incident Command Post (ICP) was set up the first week of the event (May 19) to expedite surveillance testing and was closed at the end of the week. MBAH and USDA/VS personnel continued the Incident Command Structure (ICS) to coordinate three mile surveillance testing, premises identification, testing prior to controlled marketing, and cleaning and disinfection activities. In Area Two, an ICP was set up (July 6) and was dismantled six (6) weeks later conducting the same types of activities. The EMC met in person, via conference calls several times and via e-mail as needed for updates and to review/discuss the situation. Per the Minnesota Plan, when affected premises were identified, LPAI surveillance testing of flocks within the infected and surveillance zones was conducted. Surveillance activities consisted of weekly examination and sample collection by MBAH and/or USDA/VS District Veterinarians. Between 3 – 6 miles, premises were identified, with no samples collected. 1,706 premises were identified as part of the investigations. 524 flock exams were completed on 84 flocks within the 3 mile zones (Areas One and Two). Except for premises #2, all surveillance tests were LPAI negative.

Trade Implications – Immediately after the positive H7N9 serologic results (Area One), trade bans from Russia and Japan were implemented. With the H7N9 virus confirmation at NVSL (Area Two), the OIE was notified and a News Release was prepared and released by the MBAH August 5, 2009. As a result, some of the trade restrictions for Minnesota poultry/poultry products included: Japan (Minnesota poultry slaughtered from April 16, 2009 – April 1, 2010 was ineligible), Russia (fresh/frozen poultry meat from birds raised or processed in Minnesota and slaughtered from May 15 – December 2, 2009 was ineligible, Mexico (uncooked/raw poultry and poultry meat products from Meeker County only, derived from birds slaughtered from July 5, 2009 – August 12, 2010 was ineligible) and Hong Kong (poultry and poultry products from birds raised or processed in Meeker County until February 9, 2010 was ineligible).

Repopulation – Poultry on the affected premises were quarantined and required by the MBAH to meet certain conditions before quarantine release. After depopulation of the affected premises, all barns were closed and heated, with litter samples collected to ensure a virus negative status. All buildings were washed, litter removed, cleaned/disinfected and left empty for a designated time period before MBAH inspection/approval and repopulation. Repopulation surveillance consisted of weekly testing for 42 days. Premises were repopulated with an average down time of 100 – 125 days (NVSL confirmation – premises repopulation). Flock Plans were prepared and submitted to USDA/VS for indemnity payments.

Epidemiology – USDA-VS personnel came to Minnesota (August 24 – September 4, 2009) to conduct an epidemiological investigation. Area One premises consisted of independent turkey growers associated with one out-of-state processor. Area Two premises are company owned farms located 60 miles from the Area One premises with no direct company or epidemiological links. **Area One:** These premises are all located south of the Minnesota River Valley and appear to have under gone infection during a rather narrow period of time (mid April). All flocks were tom turkey operations associated with one out-of-state processor, identified by pre-slaughter testing (3) or surveillance zone testing (1). There were no established epidemiological contacts between these farms based on interviews, observations and information gathered. When records were reviewed, the only apparent contacts were the processing trailers that picked up the previous flocks. This could indicate either undiagnosed or late breaking flocks on these vehicles prior to going to the next premises. The investigation also pointed out that 3 – 18 days after load out of the last negative flock, one of the younger flocks on the farm experienced increased mortality or respiratory signs, flocks that subsequently tested positive at 17 weeks of age. **Area Two:** These premises were identified from additional testing implemented due to the events occurring in Area One. In Area Two there were enough potential epidemiological contacts to reasonably explain movement between premises either through equipment or personnel contacts. Two sources were identified as possible vehicles of virus introduction. The first was the close proximity to known avian influenza reservoirs (gulls, ducks and geese) in and around the buildings with several opportunities for virus introductions (ventilation, standing water and feed spillage areas). The second area of concern was the daily dead bird disposal methods (rendering) used at these locations. Use of rendering for daily mortality is an acceptable method but also historically a high risk method when a route pick up brings vehicles from rendering sites to production farms on a set schedule depending upon age of the birds. Rendering itself is not the issue, but anytime there is a viable link from a rendering operation to live production facilities it will be highly suspicious since the history of these links is repeated over and over. It is clear that there is still an unidentified reservoir of this H7N9 LPAI virus, but ducks and geese are assumed to be the probable reservoir. On a related note, in 2007 in nearly the same geographic area, a commercial confinement turkey flock was also identified with antibodies to H7N9 avian influenza virus from samples collected at processing. Confirmation at NVSL (H7N9 – May 2, 2007) triggered the implementation of the Minnesota Plan at that time as well.

Implications for Future H5/H7 LPAI Events – Scientific Approach: Using an LPAI control approach that utilizes documented information (time and temperature) on known virus sources, modes of transmission, the poultry industry's infrastructure and lockdown production measures (critical biosecurity level) helped to limit the number of infected flocks and premises. **Dead Bird Disposal:** In virtually all past avian influenza events the issue of disposal of normal mortality has been a concern. Issues and comments from the field to provide improvements to current methods as well as basic suggestions to reduce risk is needed. **Wild Bird Surveillance:** Of interest and concern especially with these spring LPAI introductions is the commercial poultry and wildlife species interface. Prior to 2007, avian influenza cases in Minnesota have usually been associated with staging concentrations and related to fall migration patterns. One of the primary reasons for wild bird testing is to point to threats of potential risks to the poultry industry, especially when the wildlife sector can serve as a potential reservoir. Testing based upon areas of direct interface between commercial poultry operations and wild bird populations (gulls, ducks, geese, etc.) may involve non standard species as well as testing at inopportune times of the year, i.e. nesting times. **Program Awareness**: The H5/H7 LPAI program for commercial poultry is a voluntary program with NPIP funding and State oversight. The combination of a control program with indemnity provisions should help ensure that H5/H7 LPAI introductions are detected and eradicated. **Diagnostics:** History has shown that early detection and reporting programs decrease the chances of LPAI spread, however in 2009 diagnostic surveillance did not identify any of the positive flocks. If a grower/company perceives little value or negative consequences from diagnostic testing then it simply will not occur. Furthermore if a grower/company's philosophy or attitude discourages diagnostic testing, delayed diagnostics and virus isolation efforts after the time of infection becomes a major hole in the diagnostic surveillance program. **The Minnesota Plan:** Having a written H5/H7 LPAI response plan that all parties involved can refer to and follow is critical to provide the policy, guidelines and flexibility necessary to respond to an event. **Education:** There continues to be a need to provide basic as well as detailed information to those involved in commercial poultry production (growers, vaccination crews, cleanout crews, diagnostic laboratories, feed mill employees, equipment repairs, load out crews, etc). They have valid and legitimate concerns about basic biosecurity, disease conditions and disease transmission. **Players:** Know the players who will be involved in an event and what your expectations are from each "player". During the 2009 H7N9 LPAI event, these "players" came from the Minnesota Poultry Industry and Trade Associations, Emergency Management Committee, Private Contractors, MBAH, Minnesota Department of Agriculture, Minnesota Department of Health, University of Minnesota, USDA/FSIS, USDA/APHIS/VS (AVIC, Regional Offices, NPIP) and Wildlife Services. **Toolbox:** Having a "Toolbox" ready that includes information about premises (locations, contacts and creation of surveillance zones), field surveillance/laboratory activities and depopulation (options, equipment, personnel, SOP's). **The Message:** Have a "Communications Message"

ready. This includes “What is the Message”? “Who puts the Message Together”? “What is the Timing of the Message”? and “How will the Message be Coordinated”?

USDA Emergency Management Update – Secure Egg Supply (SES) Plan

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Since 12 July 2010, the SES plan (over 100 pages long) has been endorsed by USDA. This plan was developed in cooperation with many agencies, academia, industry, and across several States. They presented a resolution in 2007 as an egg movement protocol which was approved based on business continuity. This plan is an outgrowth of that resolution. USDA/APHIS have put 3 different plans for National Response to AI over the years starting in 2005 which latest in 2010 called the Red Book. Today, they would like to ask that USDAHA consider this new SES plan be incorporated as part of the Red Book. This is a plan related to egg production industry which would continue to ensure market continuity, minimize the spread of AI. Secure egg supply plan benefits the consumer, the producer, and the industry and is in keeping with OIE compartmentalization principles, is in keeping with biosecurity principles. It also provides a tool which regulators could use as part of the incidence command set up. The plan was developed based on science, including the monitoring, testing, epidemiology, and response steps which are recommended. Risk assessment by commodity will be completed on the industry, the virus presence on shell or egg products. The Federal and State Transport (FAST) plan which is a recognized biosecurity plan implemented by companies prior to an adverse event has been incorporated into this SES plan. Clinical signs as well as 5-bird daily mortality testing are incorporated into the plan to determine whether the virus is present in any particular flock on a given day. Different types of permits based on the commodity are being proposed (eg. non-pasteurized liquid eggs, washed/sanitized shell eggs, nest run shell eggs) each with a specific product flow guidelines, diagnostic testing requirements, and on-farm response requirements. All these permits have been developed to include risk assessment, guides on traceability, biosecurity measures, definitions of premise statuses, delineation of zones, monitoring guidelines, comprehensive cleaning and disinfection guidelines, and documentation requirements. The SES is a living document which will continuously be improved. This type of plan is currently being used as a blueprint for other commodities such as the dairy and pork industries.

The World Organization for Animal Health (OIE) Updates – Poultry

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Chair's note: Report was distributed to members in lieu of a presentation

The World Organization for Animal Health (OIE) has either updated or drafted new animal disease Code chapters for 2010. At its May 2010 General Session, the World Assembly of Delegates adopted new text to several existing chapters. In addition, in September of 2010 the OIE's Terrestrial Animal Health Standards (Code) Commission met to propose further modifications to several chapters for consideration at the May 2011 General Session. Of interest to the poultry industry, the following chapters were updated in 2010 or are being proposed for further modification in 2011:

Avian Influenza (AI). For 2010, the Code chapter on AI received a few but critical updates. Specifically the words "or Notifiable AI" were removed from Article 10.4.20. This change will minimize manipulation by some countries which have been requiring complete freedom from all notifiable AI instead of limiting any health measures to highly pathogenic AI when trading in poultry meat. For 2011 the OIE is proposing only some minor modifications to the Code Chapter which clarifies certain procedures with respect to notification of disease events.

Newcastle disease (ND). The OIE adopted the US recommended change to combine feather meal and poultry meat meal (all meals) under the same basic treatment requirements. This will facilitate trade in poultry meal related products. As with the Code Chapter on AI, for 2011 the OIE is proposing only some minor modifications clarify certain procedures for notifying disease events.

Biosecurity Procedures in Poultry Production. The OIE has drafted a new chapter addressing basic biosecurity and hygiene procedures during poultry production. This a draft was distributed for comment in September of 2009 and again in October of 2010. Based on comments received from Member Countries, the OIE is making certain changes to the text, particularly in the areas of hygiene, and actions to take when a pathogen is detected. This chapter will be presented for adoption in May 2011.

Prevention, Detection and Control of *Salmonella* in Poultry. Some minor changes are being proposed to this Code Chapter which the US industry will need to review to ensure such changes are acceptable.

West Nile Fever. For 2010 the OIE accepted comments from the United States, and the World Assembly adopted the change which removes chicks and turkey poults from the list of species that are susceptible to the virus.

Animal Welfare. For 2010 the OIE added to the existing chapters on humane transport and humane slaughter some new text pertaining specifically to poultry. The United States received comments from pertinent stakeholders many of which were incorporated into the adopted chapter. Due to the number of comments received, the specific draft chapter on broiler production was not presented for adoption in 2010. The OIE is updating the draft and will distribute it to Member countries for further comment. It is expected that the OIE Members will vote on this chapter during the next General Session in May 2011.