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

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Vice Chair: Julie D. Helm, Columbia, SC

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The Committee met on October 22, 2007 from 1:00 to 6:00 p.m. and October 23, 2007 from 12:30 to 5:30 p.m. at John Ascuaga's Nugget Hotel,Reno, Nevada. There were 64 Committee members and 68 guests in attendance, for a total of 132 attendees. Chair John A. Smith presided, assisted by Vice Chair Julie D. Helm. The Chair welcomed the Committee, summarized the 2006 meeting, and reported on the responses to the 2006 Resolutions and Recommendations.

2006 Resolution 44, Water-Based Foam for Mass Depopulation of Poultry was approved as amended. Resolution 44 requested that the American Veterinary Medical Association (AVMA) fully endorse water-based foam as an acceptable option for mass depopulation of poultry when there is a need to limit human exposure or risk of human injury, or a requirement to accomplish the task quickly due to epizootic considerations. The AVMA Executive Board has approved a policy on the use of water-based foam for depopulation of poultry that supports such use in accordance with the conditions and performance standards outlined by the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Veterinary Services (VS).

Frederic J. Hoerr, Alabama Department of Agriculture Veterinary Diagnostic Laboratory and Chair of the Mycoplasma Subcommittee, gave the Subcommittee Report. The report was approved by the Committee and is included in these proceedings.

Sherrill Davison, University of Pennsylvania and Chair of the Subcommittee on Infectious Laryngotracheitis, gave the Subcommittee Report. The report was approved by the Committee and is included in these proceedings.

Scott Westall, Pilgrim's Pride Corporation, and President of the Association of Veterinarians in Broiler Production presented the annual disease status report for the broiler industry. The report was approved by the Committee and is included in these proceedings.

Eric N. Gingerich, University of Pennsylvania, delivered the annual disease status report for the table egg industry. The report was approved by the Committee and is included in these proceedings.

Charles Corsiglia, Foster Farms, California, gave the annual disease status report for the turkey industry on behalf of Steven Clark, Alpharma Animal Health. The report was approved by the Committee and is included in these proceedings.

Charles S. Roney, United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), presented the annual status report for the National Poultry Improvement Plan (NPIP) on behalf of the NPIP Senior Coordinator, Andrew H. Rhorer, USDA-APHIS-VS. The report was approved by the Committee and is included in these proceedings.

Brenda Morningstar, National Veterinary Services Laboratory (NVSL), VS-APHIS-USDA delivered the annual NVSL Diagnostic Bacteriology, Mycoplasma, Pasteurella, and Salmonella report. The report was approved by the Committee and is included in these proceedings.

Dennis Senne, NVSL-VS-APHIS-USDA, gave the annual NVSL Avian Import Activities, Avian Influenza, and Newcastle Disease diagnostic report. The report was approved by the Committee and is included in these proceedings.

Dr Bruce Stewart-Brown, Perdue Farms, Inc., presented a report on the National Animal Health Laboratory Network. After five years of existence, a committee was convened to evaluate progress. Stewart-Brown has participated in phase one of the evaluation to identify the five or six key areas of the NAHLN to examine further in subsequent phases of the evaluation. Over 60 professionals from government, academia and industry were identified as contributors to the evaluation process. Key areas identified for further examination included program leadership, management, and organization; laboratory network structure; information technology; communication; priority agents; and laboratory quality.

Aaron Scott, Center for Epidemiology and Animal Health (CEAH), VS-APHIS-USDA, delivered a report on the National Surveillance Unit (NSU), National Animal Health Surveillance System (NAHSS), the NAHSS Steering Committee, and the National Animal Health Reporting System (NAHRS). The report was approved by the Committee and is included in these proceedings.

Kim Forde-Folle, CEAH-VS-APHIS-USDA, announced the National Animal Health Monitoring System (NAHMS) Small Enterprise Chicken Study for 2007-2008, designed to examine the bio-security practices of small poultry operations with fewer than 20,000 birds.

Dr Bruce Stewart-Brown, Perdue Farms, Inc., presented a discussion about harmonization of reportable disease requirements at the state and federal levels. The Chair will appoint a Subcommittee, chaired by Stewart-Brown, to examine this issue and report back to the Committee at next year's meeting. The Committee approved the report.

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

David Castellan, Saskatchewan, Canada summarized the Avian Influenza outbreak in that province. The report was approved by the Committee and is included in these proceedings.

Drs. David Swayne and Mary Pantin-Jackwood, USDA-ARS, Southeast Poultry Research Laboratory (SEPRL), gave an update on avian influenza and other emerging and exotic disease research at SEPRL. Their report was accepted by the Committee and is included in these proceedings.

Daniel Perez, University of Maryland, reported on the Avian Influenza Coordinated Agricultural Program (AICAP). The AICAP is a multi-institutional cooperative project whose objectives are to develop knowledge-based integrated approaches to detect, control, and prevent the emergence of avian influenza viruses. Eight major objectives include: molecular aspects of interspecies transmission and pathogenesis of avian influenza in terrestrial poultry; risk factors in live bird markets (LBM) and supply flocks; AI surveillance in LBMs, supply flocks

and wild waterfowl; education on biosecurity; and composting; diagnostics; and vaccines. Perez provided examples of a number of the ongoing projects within the program.

The Monday session adjourned at this point, at approximately 5:40 p.m. The meeting reconvened at 12:30 PM on Tuesday, October 23, 2006.

Michael David, Director of Sanitary International Standards, National Center for Import and Export, VS-APHIS-USDA, presented the annual update on the World Organization for Animal Health (OIE) poultry activities. His comments were approved by the committee and are included in these proceedings.

Charles S. Roney, NPIP, delivered an update on the status of the National Poultry Improvement Plan low pathogenic Avian Influenza control program for the Senior Coordinator, Andrew H. Rhorer. Forty-four state plans have been received, of which 28 have been approved and the remaining 16 are under review. The six states not submitted include Arizona, Connecticut, Montana, Nevada, Rhode Island and Wyoming. Connecticut has an existing plan that is functional and is being submitted. In 2006-07, 2,005,121 total tests for AI have been performed. The following table gives the distribution of tests by Subparts:

Subpart	Number of Tests
Subpart B—Egg Type Chicken Breeders	13,689
Subpart B—Commercial Table Egg Layers	50,093
Subpart C—Meat-Type Chicken Breeders	364,207
Subpart C—Commercial Meat-Type Chickens	1,413,362
Subpart D—Turkey Breeders	37,219
Subpart D—Commercial Turkeys	155,623
Subpart E—Waterfowl, Exhibition, Game Bird	16,747

Jonathan Zack, VS-APHIS-USDA, gave an update on the USDA response plans for highly pathogenic Avian Influenza. The report was approved by the Committee and is included in these proceedings.

Eric Gonder, Goldsboro Milling, presented a report on the responses to low pathogenic avian influenza in the recent West Virginia and Virginia cases in turkeys on behalf of Steven Clark, Alpharma Animal Health. The report was approved by the Committee and is included in these proceedings.

Seth Swafford, Wildlife Services (WS), APHIS-USDA, delivered an update on the USDA migratory waterfowl Avian Influenza surveillance program. His presentation was approved by the committee and is included in these proceedings.

Christopher J. Brand, United States Geological Survey, National Wildlife Health Center, United States Department of the Interior (DOI), gave an update on the DOI migratory waterfowl Avian Influenza surveillance program. His presentation was approved by the committee and is included in these proceedings.

Susan Trock, New York State Department of Agriculture and Markets, presented an update on the progress in controlling avian influenza in the Live Bird Marketing System (LBMS) in New York. The report was approved by the committee and is included in these proceedings. Trock also presented information supporting a Resolution from the Northeast United States Animal Health Association regarding allocation of funding for these avian influenza control efforts in the LBMS. A resolution on this issue was approved as amended by the Committee and submitted to the Committee on Nominations and Resolutions.

Andrea M. Miles, Poultry Health Consulting, presented background information on a proposal requesting additional research on methods of depopulation and disposal for poultry. A Resolution on this issue was approved as amended by the Committee and submitted to the Committee on Nominations and Resolutions.

Hugo Medina, Sparboe Companies, presented background information on a proposal for handling table eggs and egg products during an outbreak of highly pathogenic Avian Influenza. A Resolution on this issue was approved as amended by the Committee and submitted to the Committee on Nominations and Resolutions.

John Smith, Fieldale Farms Corporation, presented background information on behalf of Spangler Klopp, Townsends, Inc., on a Resolution requesting elimination of the requirement in the USDA Agricultural Marketing Service's National Organic Program for access of organic birds to the outdoors. A Resolution on this issue was approved as amended by the Committee and submitted to the Committee on Nominations and Resolutions.

Gregory Gray, University of Iowa, presented a paper on the need to include swine and poultry industry workers in pandemic influenza planning. The Committee approved his paper and an abstract of his presentation is included in these proceedings. A Resolution on this issue was approved by the Committee and submitted to the Committee on Nominations and Resolutions.

Francois Elvinger, USAHA Committee on Animal Health Information Systems, presented a Resolution regarding funding and planning of integrated and comprehensive animal health surveillance. This Resolution was moved and seconded by the Committee but failed to pass.

Joe Garvin, Virginia Department of Agriculture and Consumer Services, presented a Resolution regarding regional initial state response and containment plans for the National Poultry Improvement Plan (NPIP) control program for low pathogenic H5/H7 Avian Influenza. This Resolution was moved and seconded by the Committee but failed to pass.

Report of the Subcommittee on Mycoplasma

Frederick J. Hoerr, Chair
Auburn University

The subcommittee met on October 20, 2007 at the John Ascuaga's Nugget Hotel in Reno, Nevada with 22 attendees.

Frederic Hoerr, Chair, presented the report of the Subcommittee on Mycoplasma. C. Stephen Roney reported an increase in *Mycoplasma gallisepticum* (MG) in broiler chickens in the preceding year. Problems with MG continue in back yard and noncommercial chickens. Utilization of mycoplasma check test sera from Stanley Kleven, University of Georgia, is increasing. Hoerr reported on weak positive polymerace chain reaction (PCR) tests using Lauerman primers for MG in male broiler breeders, first detected at 24 weeks of age. Repeated testing at 2-week intervals showed no seroconversion and cultures were negative through 33 weeks of age. The use of three additional primer sets failed to yield a positive PCR for MG or other mycoplasmas. The flock and its progeny remained asymptomatic for MG. At 33 weeks of age, the flock was declared MG negative with continued surveillance advised, but other indicators of MG never emerged during the lifetime of the flock.

Report of the Subcommittee on Vaccinal Laryngotracheitis

Sherrill Davison, Chair
University of Pennsylvania

Subcommittee Members: Louise Dufour-Zavala, Georgia Poultry Laboratory, Oakwood, GA; Maricarmen Garcia, University of Georgia, Athens, GA; Hashim M. Ghorie, Arkansas Livestock and Poultry Commission, Little Rock, AR; Frederic J. Hoerr, Alabama Department of Agriculture, Auburn, AL; Brett Hopkins, Biomune Company, Lenexa, KS; John A. Smith, Fieldale Farms Corporation, Baldwin, GA; Donald Waldrip, Wayne Farms, Oakwood, GA.

Introduction

Vaccinal Laryngotracheitis (VLT) is an acute viral respiratory disease primarily of chickens. Economic losses attributable to VLT have been important in many poultry producing areas throughout the United States and the world. Despite efforts to control the disease through vaccination and implementation of biosecurity measures, outbreaks of VLT are still a threat to the poultry industry.

Prior suggested action items - 2006

The Committee believes that additional tools are needed for the prevention and control of VLT and suggests the following:

- Studies of currently available vector vaccines by the *in ovo* route should be continued.
- Research should be conducted to develop newer molecular vaccines to control and prevent VLT.
- Vaccine manufacturers should determine if an adequate supply of Chick Embryo Origin (CEO) vaccine is available if its use is required in an outbreak situation.
- States should institute the use of a Geographic Information System as an integral part of control and prevention measures.

Update - vaccination trials

Over the past year, additional field evaluations of the Fowl Pox-Laryngotracheitis (FP-LT) vaccine in broilers by the *in ovo* route of vaccination have been conducted. Some reported that the *in ovo* dose has been reduced to lessen the effect of the vaccine on hatchability and 7-day mortality. In the field, the FP-LT vaccine did stop the spread of VLT between flocks in some locations. However, it has been reported that in "hot areas" *in ovo* vaccinated broiler flocks did break with VLT. Clinical signs and mortality was reduced but not prevented. FP-LT has also been used in *ovo* in combination with the CEO field boost at 2 - 2.5 weeks of age. It was noted that the *in ovo* vaccination FP-LT appears to “buffer” the reaction to the CEO vaccination.

It was previously reported that laboratory challenge in layer pullets vaccinated at one day of age subcutaneously with the HVT-LT vaccine demonstrated 100 percent protection at 3, 7, 10 and 15 weeks post-vaccination and 80 percent and 70 percent protection at 20 weeks and 25 weeks post-vaccination respectively. Recently, the recombinant HVT-LT vaccine has been used in the field in broilers and layer pullets. Results from the field evaluations will be reported at a later date when additional data is available.

Current suggested action items - 2007

The Committee believes that:

- Studies of currently available vector vaccines by the *in ovo* route should be continued.
- Research should be conducted to develop newer molecular vaccines to control and prevent VLT.
- States should adopt the Model State Program –VLT (USAHA – 2005).
- Procedures of proper administration of CEO and TCO vaccines must be reviewed.
- Field evaluations must be conducted in conjunction with laboratory research to evaluate the efficacy of control procedures.

References

Rosenberger, J. K. and Rosenberger, S.C., ILT vaccines: field and laboratory assessments, Proceedings of the Poultry Health and Processing, Ocean City, Maryland, pp. 81 -85, October 2006.

2007 United States Broiler Industry Update

Scott Westall
Pilgrim's Pride, Inc.

Based on yearly Agristats data for field condemnations, 7-day mortality, and total mortality, US broiler flock health has seen a slight decline over the past year. The decline was seen across all three parameters and is most likely due to continued issues with Infectious Laryngotracheitis (ILT) and runting stunting syndrome (RSS). A poll of broiler production veterinarians ranks ILT and RSS as the top two challenges facing the poultry industry.

ILT and mycoplasma are the two highest-ranking respiratory diseases. New vaccines and vaccination techniques are currently being implemented to control ILT. Mycoplasma was an issue earlier in the year but recently its spread has been limited. Infectious bronchitis (IBV) and Newcastle disease (ND) have been minor issues so far.

RSS, gangrenous dermatitis (GD), and infectious bursal disease (IBD) are the three top ranking immunosuppressive diseases. A consensus on the causative agent or agents of RSS has not been reached. However, there is no doubt that RSS related immunosuppression has impacted flock uniformity and processability and increased the incidence of secondary infections with GD and inclusion body hepatitis (IBH). IBD is also frequently implicated in these secondary infections.

Coccidiosis and necrotic enteritis (NE) are the top ranking enteric diseases. These issues are probably related and may take a more prominent role as feed costs increase.

Avian influenza (AI) has not directly impacted US broiler flocks although two outbreaks in commercial turkey flocks led to increased surveillance for broiler flocks in close proximity to the breaks. Broiler veterinarians indicate that a lot of time is still being devoted to AI education and contingency planning.

Antibiotic usage and Nutrition will play a more prominent role in broiler health in the coming year. Lack of effective antibiotics to treat diseases and increasing demand for "antibiotic free" production will increase the need for creative disease control and prevention strategies to maintain our current high level of health, welfare, and productivity. Nutritional strategies are also changing due to high input costs. Veterinarians will be challenged to make sure the nutritional needs of the birds are met. Failure to do so could result in classical deficiency diseases and immunosuppression.

Ranking of Disease Concerns among 17 Broiler Production Veterinarians

Infectious Laryngotracheitis	12
Runting Stunting Syndrome	8
Gangrenous Dermatitis	6
Mycoplasmosis	5
Chick Quality	3
Infectious Bursal Disease	3
Coccidiosis	2
Infectious Bronchitis Virus	2
Legs- Skeletal Issues	2
Necrotic Enteritis	2
Airsacculitis	1
Cholera	1
Inclusion Body Hepatitis	1
Roundworms	1

Ranking of Non-Disease Concerns among 17 Broiler Production Veterinarians

Antibiotic Issues	6
Management	3
Welfare	3
Avian Influenza (education and planning)	2
Feed/Nutrition	2
Food Safety	1
Dead Bird Disposal	1
Litter Beetles	1
Litter Supply	1

United States Table Egg Industry Update October 2006 to October 2007

Eric Gingerich, DVM
University of Pennsylvania

Overall health of the national table egg layer flock is very good. 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 in environmentally controlled facilities in cages off litter, and the use of sound biosecurity practices.

A poll of the Association of Veterinarians in Egg Production (AVEP) was conducted and 14 of 65 members responded. The survey revealed the following diseases of concern occurring in U.S. layer flocks: 1.)E. coli/peritonitis, 2.) a 3-way tie – coccidiosis/necrotic enteritis, *Mycoplasma gallisepticum* (Mg), and calcium depletion/tetany, and 5.) a 2-way tie – respiratory viruses (IB) and cannibalism. Other diseases of concern for diseases threatening the industry are avian influenza (AI) and *Salmonella enteritidis* (SE).

Colibacillosis is a problem mainly of young flocks with mortality rates of 0.5 to 4 percent per week starting shortly after housing. It is felt that this condition is most often secondary to upper respiratory challenges with Mg, *Mycoplasma synoviae* (Ms), ammonia, infectious bronchitis (IB), etc. It also may be a primary problem if water lines are contaminated with *E. coli*. The overall incidence of early onset colibacillosis is down from recent years. 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.

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 vaccine is being used in a variety of situations and appears to be useful in low challenge situations but still continues to be evaluated in high challenge facilities. Vaccine failures are somewhat common and the unit must resort to medication programs using tylosin or tetracycline antibiotics.

Coccidiosis and necrotic enteritis has been increasing in incidence in caged layers especially on the east coast and in one strain of layer. Vaccination of pullets is being used successfully as control.

Calcium depletion is normally associated with low intake of calcium, phosphorus, and/or vitamin D3 especially early in production with low feed intakes. Calcium tetany is seen when young flocks that are slow to mature are placed on calcium rich feeds too early. A post-molt problem with calcium tetany is also being found due to excessive calcium intake during the molt resulting in a shutdown on normal hormonal action to pull calcium from the medullary bone.

Cannibalism continues to be seen especially in high light intensity situations in both caged and cage-free syste In these cases, the 10-day rule for beak trimming results 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.

AI continues to be a very high concern across the country. Active and passive surveillance programs are increasing across the US in response to the threat of highly pathogenic H5N1 AI (HPAI) from Asia. There is great concern in the layer industry as to the effect of the response to an AI outbreak on movement of eggs and birds from negative flocks in or near the control zones. Discussion and research as to the best ways of bird euthanasia and disposal from large cage layer houses and complexes continues. The threat of low pathogenic AI (LPAI) for layer flocks on the East coast is much reduced due to the efforts by New York and New Jersey Departments of Agriculture and USDA to reduce the positivity of the live bird markets from 60 percent positive markets in 2004 to near zero since. No significant AI isolations have been made in layer flocks in the U.S. in the last year. A majority of egg operations are complying with the National Poultry Improvement Plan (NPIP) low pathogenic AI (LPAI) program for commercial layers.

SE was felt to be an issue that was being addressed adequately by state and industry egg quality assurance programs until the announcement on September 22, 2004 that the Food and Drug Administration (FDA) was proposing a program “Prevention of SE in Shell Eggs during Production”. FDA received over 200 written comments. Issues discussed were 1) laboratory procedures and laboratory availability for testing, 2) funding for testing, costs incurred if eggs are diverted, and administration of the program, 3) lack of egg pasteurization facilities in many egg producing areas to be able to effectively divert eggs from high risk flocks, 4) wet washing houses required between flocks where SE positive manure samples were found in the previous flock whereas dry cleaning, fumigation, vaccination of in-coming pullets, plus good rodent control has been found to be effective, 5) the excessively low requirement for 45 F egg storage prior to processing, etc. Comments were reopened in May of 2005 to ask questions about pullets. The initiation of this program is in doubt as it is stalled in the Office of Management and Budget (OMB), which has been studying it for over a year. The incidence of egg-

related SE outbreaks continues steady apparently due to areas of egg production where SE risk reduction programs are either not effective or totally embraced.

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 recombinant pox-vectored ILT vaccine has been determined not to be a suitable replacement for chick embryo origin (CEO) vaccines in high challenge areas but a good reduction of ILT losses in a region of high ILT incidence has been seen. The new HVT-vectored ILT vaccine is showing great promise and if effective will reduce the amount of CEO vaccine used in layer flocks that may spread to broilers.

Diseases that are very rarely a problem for table egg layers are pox, Marek's, Newcastle, infectious bursal disease, chick anemia virus, and fowl cholera.

Poultry welfare concerns are increasing as activist groups increase their activities in portraying the caged egg industry as not humane. Activists are promoting laws against caged egg production in several states including a major egg producing state, California. The United Egg Producers (UEP) Certified Animal Care Program now requires the use of full feed molting. Full feed molting programs have been proven to be fully workable in most operations. There continues to be concern that some producers will discontinue the UEP program due to competition with non-compliant producers in markets that are not requiring these cost-increasing welfare practices. Many producers of egg breaking stocks are now joining the UEP welfare program due to pressure from their customers.

The egg industry has experienced record egg prices and profits since the first of 2007 to present in spite of increased corn and feed prices. Reduced numbers of layers due the UEP required reduction in layers per cage and increased exports to Europe and Asia are felt to be the reasons.

Current Health and Industry Issues Facing the Turkey Industry

Steven Clark
Alpharma Animal Health

Mark Blakley
Carroll's Turkeys

Dave Mills
Jennie-O Turkey Store Company

In preparation for this report Clark and turkey industry colleagues Drs. Blakley and Mills, contacted several U.S. turkey industry professionals and veterinarians to inquire about the health status of turkeys produced in August 2006 through August 2007. 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 lists in Table 1 the challenges by disease and issues.

The lack of approved efficacious drugs continues to be the top disease issue. The withdrawal of the NADA for enrofloxacin use in poultry in 2005 leaves the industry with no adequate therapeutic response to colibacillosis (ranked 2), or fowl cholera (ranked 9). The turkey industry supports the scientific examination of the evidence in the cases against the use of antibiotics in agriculture, and supports the continued judicious use of antibiotics in animal agriculture.

Late mortality (3) and leg problems (4) are among the top concerns of the turkey industry. Late Mortality may be defined as mortality in excess of 1.5 percent per week in toms (males) 17 weeks and older; mortality is not diagnosed to a specific disease or cause. Excess cumulative mortality of 5 to 10 percent 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 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, including pododermatitis, fractured femurs, fractured tibia, osteomyelitis (OM), tibial dyschondroplasia (TDC), spondylolisthesis, "Shaky Leg", etc.

Blackhead, also known as Histomoniasis, (ranked 22) is one disease with no efficacious drug approved for use in turkeys. There were 68 reported cases of blackhead (Table 3). 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. It seems unconscionable that the industry is unable to prevent the suffering and death in flocks affected by histomoniasis when effective, yet unapproved, treatments exist. The industry recommends FDA consideration to allow limited use of such product(s) in valuable breeder stock.

Cellulitis (Table 2) remains a major disease issue across all geographic regions although the survey average decreased to a score of 3.1 and ranked 5th, from 3.5 and 3rd, respectively, the prior year. Analysis indicates a range of levels of concern; 26 percent of respondents score cellulitis at 5 (severe) and 22 percent at 1. Cellulitis is most commonly seen in, but not limited to, commercial male turkeys nearing market age. The prevalence and severity of cellulitis continues to increase. Veterinarians indicate that the occurrence is now 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 serosanguinous 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. Affected flocks have mortality greater than or equal to 0.5 dead per 1,000 birds 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 (Table 2).

Poult enteritis of unknown etiologies (7) and heat stress (6) rank high on the list. *Ornithobacterium rhinotracheale* (ORT, ranked 17 versus 8 previously), Poult Enteritis Mortality Syndrome (PEMS ranked 31 versus 29 previously), and protozoal enteritis (22 versus 19) all decreased in ranking on this year's survey. Avian Metapneumovirus (AmPV ranked 33 compared to 30) decreased in importance in the latest survey, as the incidence in geographical areas decreased.

Mycoplasma synoviae (MS) infections (infectious synovitis) 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 51 cases of MS reported (Table 3). The primary breeders have remained free of

Highly pathogenic avian influenza (H5N1) continues to infect poultry in Southeast Asia, with sporadic introductions in Europe and Africa. Poultry in the U.S. have continued to remain negative for Highly Pathogenic Avian Influenza (H5N1). The possibility of the spread of this virus to the U.S. through the illegal transport of infected birds or migration of infected wild birds remains a concern. The NPIP Commercial Poultry H5/H7 LPAI surveillance program provides for 100 percent indemnity for commercial plan participants. In many geographic areas where flock isolation is practical, controlled marketing may be the preferred method of eradication since consumption of meat from LPAI flocks does not pose a risk to the public health. If flock destruction is necessary in the eradication of H5/H7 LPAI, then 100 percent indemnity is appropriate, as it is already provided for in the eradication of HPAI.

The federal regulations governing the use of autogenous veterinary biologicals are antiquated and inhibitory toward effective preventive applications in the poultry industry. The main issues include the narrow time limits on the use of a microbiological isolate and the restrictions requiring use only in the herd of origin. The industry urges the Veterinary Services (VS), Center for Veterinary Biologics (CVB) to revise these regulations in favor of a more effective and user -friendly approach.

While the consumer and industry both desire safe food, public health officials and veterinarians must realize that the most effective interventions to prevent food-borne illness remain proper food preparation and handling. Proper food handling and appropriate processing technologies are the best way forward. Attempting to control food-borne disease by selectively eliminating normal intestinal inhabitants of domestic animals, as with the recent USDA Food Safety and Inspection Service (FSIS) focus on pre-harvest salmonella control, essentially represents a national certified raw meat program similar to the hazardous certified raw milk program. Such an effort is distracting to the main food preparation issues, and represents a major policy development failure. While significant progress has been made in *E. coli* 0157 control in beef, it must be pointed out that the improvements resulted from improved processing technology, not on-farm interventions. Pre-harvest interventions were not a factor.

National Animal Identification System (NAIS) is a modern, streamlined information system that helps producers and animal health officials respond quickly and effectively to animal health events in the US. The commercial, integrated poultry industry has the ability to do detailed trace backs within 48 hours. The industry has been tracking flocks for many years, and continues to update programs that streamline the ability to do epidemiological trace backs. We urge the USDA to consider developing criteria required to conduct adequate trace backs for the poultry industry rather than mandating a specific national program. A new national program would be costly and redundant because the industry would be required to overlay this on existing programs that are already more than adequate.

Over the past decade, the industry has adapted its production systems from multi-age facilities to single-age operations. The current survey reports that 55 percent (Table 3) on average, of the respondent's turkey operations are single-age production (all-in/all-out, brood-n-move). Single-age production systems have shown benefits to control/minimize disease challenges specific to different geographical areas.

Turkey Production in 2006 increased from 7206.56 to 7417.84 million pounds (live weight). Overall domestic per capita consumption for turkey products increased slightly from 16.654 to 16.874 pounds. Exports decreased slightly from 570 to 546 million pounds from 2005 to 2006. Production increased to 261.96 million head slaughtered with an average live weight of 28.32 pounds, compared to prior year figures of 252.053 million head and 28.15 pounds average weight, respectively (reference: Turkey Sourcebook, National Turkey Federation).

Table 1. Turkey health survey (September 2007) of US veterinarians in turkey production ranking current disease issues (1= no issue to 5 = severe problem). Survey response (reply) is 100% (n=23).

Issue	Score Average (1-5)
Lack of approved, efficacious drugs	4.7
Colibacillosis	3.4
Late Mortality	3.4
Leg Problems	3.3
Cellulitis	3.1
Heat stress	3.1
Poult Enteritis of unknown etiologies	3.0
Bordetella avium	2.7
Cholera	2.7
Breast Blisters and Breast Buttons	2.7

Osteomyelitis (OM)	2.6
Fractures	2.5
Cannibalism	2.5
H3N2 Swine influenza	2.4
Salmonella	2.4
Tibial Dyschondroplasia (TDC, Osteochondrosis)	2.4
Ornithobacterium rhinotracheale (ORT)	2.4
Newcastle Disease Virus (NDV)	2.2
Blackhead (Histomoniasis)	2.1
Coccidiosis	2.0
Round Worms (Ascaridia dissimilis)	2.0
Protozoal Enteritis	2.0
Shaky Leg Syndrome	2.0
Mycoplasma iowae (MI)	1.9
Erysipelas	1.7
Avian Influenza	1.6
Mycoplasma gallisepticum (MG)	1.6
Mycoplasma synoviae (MS)	1.6
Necrotic enteritis	1.4
Turkey Coronavirus	1.4
PEMS (Poult Enteritis Mortality Syndrome)	1.3
Mycoplasma meleagridis (MM)	1.2
Avian Metapneumovirus	1.2
Spondylolisthesis (Kinky-Back)	1.2

Table 2. Cellulitis survey (September 2007) of US veterinarians in turkey production ranking current disease issues (1 = NO to 2 = YES, mild to 5 = YES, severe). Survey response (reply) is 100% (n=23).

	2007	**2006**
Clinical presentation: acute mortality?	3.0	3.2
Bubble tail?	1.9	1.9
Abdominal subcutaneous fluid and crepitus?	3.3	3.5
Problem is less (1) - more (5) severe compared to prior year?	2.4	
Composter for dead bird disposal?	1.7	1.2
[Clostridium] contaminated meat-bone meal?	1.5	2.1
Meat-bone meal possibly "feeds" the gut clostridium?	1.7	1.8
Increased amount of unabsorbed protein in lower gut?	1.5	
Decreased incidence associated with formaldehyde feed treatment?	1.2	1.5
Decreased mortality/severity associated with formaldehyde feed treatment?	1.3	
Decreased incidence associated with intense water sanitation program?	1.5	1.6
Multi-age farm sites?	1.9	1.8
In hens?	1.8	1.8
In toms?	3.2	3.3
Mash feed?	1.4	1.4
Pelleted feed?	1.6	2.0
Expanded feed (expander milling process)?	1.3	1.2
Reused litter?	2.6	2.9

Table 3. Turkey health survey (September 2007) of US veterinarians in turkey production. Survey response (reply) is 100% (n=23).

Cases (##) of Blackhead	68
Cases (##) of Mycoplasma synoviae (MS)	52

Average of turkey operation utilize the Brooder Hub (off-site/single-age) system	56%

National Poultry Improvement Plan Status Report

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Presented by Charles S. Roney
National Poultry Improvement Plan

Pullorum-Typhoid Status

In calendar year 2006, there were no isolations /outbreaks of *Salmonella pullorum* reported to the National Poultry Improvement Staff. There were no isolations/outbreaks of *Salmonella pullorum* reported during calendar year 2007 from January to October 1, 2007. There have been no isolations of *Salmonella gallinarum* since 1988 in any type poultry.

Hatchery Participation in the National Poultry Improvement Plan Testing Year 2006	
Egg and Meat-Type Chickens: Participating	283
Capacity	698,974,826
Turkeys: Participating	49
Capacity	33,285,723
Waterfowl, Exhibition Poultry and Game Birds: Participating	721
Capacity	26,321,162

Egg-Type Chicken Breeding Flocks in the National Poultry Improvement Plan Participation and Testing Summary Testing Year 2006	
U.S. Pullorum-Typhoid Clean: Participating- Number	184
Birds in Flocks-Number	3,914,294
Average per Flock	21,273
Primary Breeding Flocks: Flocks – Proportion of Total	21.7
Primary Breeding Flocks: Birds- Proportion of Total	12.2

Meat-Type Chicken Breeding Flocks in the National Poultry Improvement Plan Participation and Testing Summary Testing Year 2006	
U.S. Pullorum-Typhoid Clean: Participating- Number	4,866
Birds in Flocks-Number	76,744,870
Average per Flock	15,772
Primary Breeding Flocks: Flocks-Proportion of Total	9.7
Primary Breeding Flocks: Birds-Proportion of Total	6.5

Turkey Breeding Flocks in the National Poultry Improvement Plan Participation and Testing Summary Testing Year 2006	
U.S. Pullorum-Typhoid Clean: Participating –Number	525
Birds in Flocks-Number	4,009,155
Average per Flock	7,636
Primary Breeding Flocks: Flocks-Proportion of Total	20.6
Primary Breeding Flocks: Birds-Proportion of Total	7.1

Waterfowl, Exhibition Poultry, and Game Birds Breeding Flocks In the National Poultry Improvement Plan Participation and Testing Summary Testing Year 2006	
U. S. Pullorum-Typhoid Clean Participating	3,826
Birds in Flocks	1,470,287
Primary Breeding Flocks: Flocks-Proportion of Total	32.6

Primary Breeding Flocks: Birds- Proportion of Total	48.2

Mycoplasma gallisepticum, *Mycoplasma synoviae*, and *Mycoplasma meleagridis* positive breeding flocks National Poultry Improvement Plan 2006/7				
	WEGBY	Egg-type Chickens	Meat-Type Chickens	Turkeys
Mycoplasma gallisepticum	17	0	35	1
Mycoplasma synoviae	17	4	43	5
Mycoplasma meleagridis		0		2

U.S. *Salmonella enteritidis* Clean- Egg-Type Chickens No. of flocks and birds in flocks by State with *Salmonella enteritidis* isolates, 1990-2006			
	Environmental	Dead Germ	Bird
Arkansas			
Flocks	1		2
Birds in Flocks	6000		15000
Georgia			
Flocks	1	2	
Birds in Flocks	400	46000	
Illinois			
Flocks	3	2	1
Birds in Flocks	3900	3700	1200
Indiana			
Flocks	15	2	1
Birds in Flocks	158345	27479	15092
Kentucky			
Flocks	1		
Birds in Flocks	6625		
Ohio			
Flocks	14		9
Birds in Flocks	183700		91600
Oregon			
Flocks	2		
Birds in Flocks	19516		
Pennsylvania			
Flocks	14		6
Birds in Flocks	166385		78450
Texas			
Flocks	1		
Birds in Flocks	10000		

Egg-type Chicken breeding flocks with isolates of *Salmonella enteritidis* by phage type and by year 1989-2006		
Year	No. Flocks	Phage Type
1989	1	13A
1990	11	13A, 13, 8, 28
1991	12	13A, 13, 8
1992	10	Untypable, 13A, 8,28,34
1993	5	Untypable, 8, 2
1994	3	13A, 8
1995	2	13A, 28

1996	5	Untypable, RNDC, 13A, 8,2
1997	2	8
1998	2	8
1999	1	13
2000	4	13, 8
2001	1	13
2002	0	
2003	0	
2004	0	
2005	1	13
2006	1	34
2007	4	13, 8

U.S. *Salmonella enteritidis* Clean Egg-Type Chickens
Number of flocks and birds in the flocks with *Salmonella enteritidis* isolates, 1990-2007

	Environmental	Dead Germ	Bird
Flocks	60	6	19
Birds in Flocks	599,871	77,179	201,342

National Veterinary Services Laboratories Summary of Poultry Pasteurella-Salmonella-Mycoplasma Activities, 2007

Brenda Morningstar
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USDA-APHIS-VS

Pasteurella

During the period of August 1, 2006 through July 31, 2007, the National Veterinary Services Laboratories (NVSL) received 297 *Pasteurella multocida* isolates for characterization. Of these, 58.5 percent were submitted for somatic type analysis, 13.6 percent were submitted for DNA fingerprint analysis, and 27.7 percent of isolates were submitted for both tests. Results indicated that 18.2 percent were type 3, 4; 12.5 percent were type 1; 11.4 percent were type 3; and five percent were type 4. A total of 45.4 percent of the isolates were identified as other somatic types. The somatic type of 7.4 percent of the isolates could not be identified.

Salmonella

During the period of July 1, 2006 through June 30, 2007, the NVSL serotyped 18,246 *Salmonella* isolates recovered from animals, their environment, or feed. Of the 4979 poultry isolates (27 percent of total isolates), 3162 were recovered from chickens or their environment and 1817 were recovered from turkeys or their environment. The most common serotypes found in poultry this year are listed in Tables 1 and 2.

Table 1: Most Frequently Identified Serotypes from Chickens

Clinical	Monitor
Enteritidis	Kentucky
Kentucky	Heidelberg
Typhimurium	Enteritidis
Heidelberg	Senftenberg
Senftenberg	Typhimurium

Table 2: Most Frequently Identified Serotypes from Turkeys

Clinical	Monitor
Senftenberg	Hadar
Anatum	Schwarzengrund
Hadar	London
Montevideo	Heidelberg
Agona	Saintpaul

Mycoplasma

During the period of August 15, 2006 through August 15, 2007, the NVSL performed 285 avian *Mycoplasma* hemagglutination inhibition tests; a 35 percent increase in testing from last year. During this same period, 1245 ml of hemagglutination antigen and 946 ml of control sera were provided to other diagnostic laboratories.

Avian Import Activities Fiscal Year 2007

Larry White
Delivered by Dennis Senne
National Veterinary Services Laboratory

Poultry and Hatching Eggs: During fiscal year (FY) 2007, 12,220,533 poultry including day old chicks, and 21,643,687 poultry hatching eggs were imported into the United States.

Commercial Birds: The imports of commercial birds are limited to those that are exempt for the Wild Bird Conservation Act, serviced by the U.S. Fish and Wildlife Service. During FY 2007, 452,188 commercial birds were released from USDA-supervised private bird quarantine facilities.

Pet Bird Program: There were 8,448 pet birds imported into the United States and quarantined at a USDA-operated animal import centers during FY 2007. The number of home quarantined birds was 538.

Ratite Importations: No ratites or ratite hatching eggs were imported into the United States. The current price of ratites and hatching eggs does not justify the cost of importing such birds.

Smuggled/confiscated birds: There were 266 birds confiscated by U.S. Customs during FY 2007.

National Veterinary Services Laboratory Avian Influenza and Newcastle Disease Activities FY 2007

Dennis Senne
National Veterinary Services Laboratory

AVIAN INFLUENZA

Live Bird Marketing System (LBMS): In FY 2007 the National Veterinary Services Laboratories (NVSL) tested 4,666 specimens in 859 submissions from 13 states (Connecticut, Florida, Kansas, Massachusetts, Maine, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, and Wisconsin) by virus isolation in embryonating chicken eggs for presence of avian influenza virus (AIV) and avian paramyxovirus type-1 (APMV-1) as part of the ongoing LBMS surveillance. The surveillance is a collaborative effort between individual States and the U.S. Department of Agriculture; however, only specimens submitted to NVSL are included in this report.

FY 2007 marked the successful eradication of the low pathogenicity H7N2 AIV that had been circulating in the live bird market system (LBMS) in the Northeast United States since 1994. The H7N2 virus has not been detected since March 2006. AIV or APMV was isolated from 17 percent (146 of 859) of LBMS submissions and 4.7 percent (217 of 4666) of specimens tested. Low pathogenicity H5 AIV was the most common subtype found in the LBMS this year; it was isolated from 39 specimens in 35 submissions. The H5N2 subtype AIV was isolated from 36 specimens from New York, and one each from New Jersey and Pennsylvania. In addition, an H5N9 subtype was isolated from a single specimen from Pennsylvania. The H5 viruses were shown to be low pathogenicity avian influenza (LPAI) virus by the chicken pathogenicity test and deduced amino acid profile at the hemagglutinin (H) cleavage site. Genetic studies showed the H5 viruses to be most closely related to North American H5 viruses circulating in wild ducks. Other subtypes of AIV isolated and the states the specimens originated and the number of isolations were: H2N3 (Ohio, n=2), H3N6 (Pennsylvania), H4N6 (New Jersey, n=2; New York, n=4; and Pennsylvania), H6N5 (Pennsylvania), H6N8 (New Jersey), H9N2 (New York), H10N7 (Pennsylvania), H11N2 (Massachusetts, n=2; New Jersey, n=2; and New York), and H11N9 (Pennsylvania). The remaining 159 viruses isolated were identified as APMV; 151 were identified as APMV-1 from nine states (Connecticut, Florida, Massachusetts, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, and Wisconsin), three were APMV-4 from Connecticut (2) and Pennslyvania, one was APMV-6 from New York and four were pigeon paramyxovirus type-1 (PPMV-1) viruses from New Jersey, New York and Pennsylvania. Pathogenicity of representative APMV-1 isolates from each submission was determined by the intracerebral pathogenicity index (ICPI, n=26) test and deduced amino acid profile at the fusion protein cleavage site (n=75). All but four isolates were characterized as low virulent (lentogenic pathotype) strains; the for isolates were characterized as pigeon paramyxovirus type-1 (PPMV-1), a pigeon-adapted variant of Newcastle disease virus.

Low Pathogenicity Avian Influenza (LPAI) in Commercial Poultry and Backyard Birds. Surveillance for AIV in commercial poultry continued in FY 2007 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. Three outbreaks of LP notifiable AI were detected in three states (West Virginia, Nebraska and Virginai) and reported to the World Organization for Animal Health (OIE) in FY 2007. The West Virgina outbreak occurred in April 2007 and involved a single flock of 25,600 turkeys. Pre-slaughter testing resulted in detection of antibodies to the H5N2 subtype AIV. Additional specimens collected from the flock were positive for H5 specific RNA by real-time reverse transcription-polymerase chain reaction (rRT-PCR) but no virus was isolated in embryonated chicken eggs. Sequencing of the RNA from the clinical specimen showed the cleavage site of the H gene to be consistent with that of LPAI H5 virus. The premises were depopulated. The outbreak of LPNAI in Nebraska occurred in June 2007 and involved a multi-age turkey operation of 145,000 birds. Antibodies to H7N9 subtype AIV were initially detected in serum samples collected at slaughter. Subsequent testing of younger birds on the premises showed presence of AI specific RNA by rRT-PCR in swab specimens; the H7N9 subtype AIV was also isolated and characterized as LPAI. The flock was disposed of by controlled marketing. Additional surveillance in surrounding flocks did not detect further spread of the virus. The third outbreak of LPNAI occurred in a flock of 54,000 turkeys in Virginia in July 2007. Initially, H5N1 specific antibodies were detected in pre-slaughter serum samples. Subsequent testing showed H5 RNA in clinical specimens by rRT-PCR but no H5N1 virus was isolated. However, the H5N1 virus was isolated from additional specimens collected at depopulation and characterized as LPAI. Surveillance of surrounding premises did not detect additional infections.

In addition to the outbreaks of notifiable AI H5 and H7, there were two submissions where only antibodies to H5 or H7 were detected. Isolated detections of antibodies in a flock in the absence of clinical disease or

epidemiologic link to an outbreak are not reportable. The first such case involved a flock of 9,500 turkeys in Minnesota. In May 2007 antibodies to H7N9 were detected in serum samples collected at slaughter. Pre-market serum samples collected two weeks prior to slaughter tested negative by the AI agar gel immunodiffusion test. Surveillance in the region did not detect additional positive flocks. The second case involved a flock of ducks and guinea fowl in Ohio in April 2007. Pre-movement testing required for interstate movement detected antibodies to H5N2 and H4N2 in serum samples. No virus was isolated from the flock, and rRT-PCR tests were negative for H5 specific RNA. Surveillance of adjacent flocks did not detect any infection.

In FY 2007, 407 submissions were received from 23 states for AIV antibody detection and subtyping. The majority of the submissions (371) were from commercial poultry (369 from turkeys and two from chickens) from 11 states (Arkansas, Iowa, Illinois, Indiana, Michigan, Minnesota, North Carolina, Ohio, South Carolina, South Dakota, and Wisconsin) that were positive for antibodies to subtypes H1 and/or H3 in combination with N1 and/or N2. Vaccination for H1 and H3 is commonly practiced in turkey breeder flocks that are raised in close proximity to swine. Therefore, the total number of positive flocks may represent multiple testing of the same breeder flocks to fulfill the quarterly testing requirements under the National Poultry Improvement Plan. Detection of AIV or AIV-specific antibodies to AIV in non-commercial poultry/birds is shown in Table 1.

AIV Surveillance in Wild Waterfowl. In 2007, funding was appropriated for surveillance to detect the highly pathogenic Asian strain of H5N1 in waterfowl in Alaska and the lower 48 states. The waterfowl surveillance is a cooperative effort between USDA's Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS), National Wildlife Research Center, and the Department of Interior's United States Geological Survey (USGS) National Wildlife Health Center. Specimens collected from wild-caught and hunter-killed waterfowl as well as from water, environment and feces were screened by rRT-PCR for AIV specific RNA at WS, National Animal Health Laboratory Network (NAHLN) laboratories and at the USGS laboratory in Madison, WI. Presumptive H5 and H7 positive specimens from WS, NAHLN and USGS were submitted to the NVSL for confirmation and virus isolation. In addition, specimens from wild bird mortality events (>500 birds) were submitted directly to the NVSL for testing. Between October 2006 and September 2007 more than 1,500 presumptive positive specimens were received for confirmation testing. No HPAI H5N1 was detected. However, LPAI H5N1 was detected in specimens submitted from 5 states (Delaware, Illinois, New Jersey, Maryland, and Michigan). The predominant subtype isolated was H5N2 with 46 isolations from 23 states. Additional H5 viruses with various N subtypes were detected as well. All H5 and H7 AIVs were characterized as LPAI viruses of North American lineage. Other AIV subtypes isolated included H1 through H4, H6, H7, H10 and H11. Details of the wild bird surveillance will be reported separately.

General Surveillance for HPAI and vND Viruses. The NVSL routinely receives specimens from investigations of suspected cases of foreign poultry diseases (FPD). During FY 2007, 654 specimens in 91 submissions from FPD investigations in 22 states were tested at the NVSL. No HPAI or vNDV was detected.

rRT-PCR Proficiency Test Panels. 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 2007, PTs were distributed to 243 diagnosticians in 55 laboratories for AI rRT-PCR and 242 diagnosticians in 54 laboratories for APMV-1 (Newcastle disease) rRT-PCR.

AI Diagnostic Reagents Supplied by the NVSL. A total of 18,221 units of AGID reagents (antigen and enhancement serum) were produced and shipped to 92 state, university, and private laboratories in 36 states during FY 2007. The quantity is sufficient for approximately 2,186,520 AGID tests. An additional 1,234 units (148,080 tests) were shipped to 22 foreign laboratories.

International Training. In FY 2007 the NVSL, in collaboration with Iowa State University, Southeast Poultry Research Laboratory and the Foreign Agricultural Service, conducted two one-week courses on laboratory diagnosis of AI for 47 persons in 27 countries. In addition, NVSL personnel conducted in-country training on diagnosis of AI in Brazil (16 persons, 5 countries), Mexico (7 persons,) and Tanzania (10 persons).

NEWCASTLE DISEASE

Isolations of Virulent Newcastle Disease Virus (vNDV). In FY 2007 no vNDV was isolated from domestic poultry, imported caged (pet) birds, or birds confiscated by U.S. Customs in FY 2007. However, pigeon paramyxovirus type-1 (PPMV-1), a pigeon-adapted variant of NDV, was isolated from 41 pigeons and dove specimens in 12 states (Arizona, Georgia, Florida, Iowa, Maine, Michigan, Minnesota, New York, Ohio, Pennsylvania, South Carolina, and South Dakota).

Isolations of Low Virulent Newcastle Disease Virus (Avian Paramyxovirus Type-1, APMV-1). During FY 2007, 86 isolates of APMV-1 were received for characterization at the NVSL or were isolated at the NVSL from diagnostic and wild bird submissions. All of the isolates were characterized as low virulent NDV by the intracerebral pathogenicity index (ICPI) test and/or by deduced amino acid motif at the cleavage site of the fusion protein.

Newcastle Disease Diagnostic Reagents Supplied by the NVSL. A total of 303 vials (2ml each) of inactivated LaSota antigen were shipped to 10 domestic laboratories in 9 states and to 8 foreign laboratories. In addition, 4 vials (0.6ml each) of live LaSota virus were shipped to 3 domestic laboratories and 73 vials (2ml) of ND antiserum were shipped to 6 domestic laboratories in 6 states and 9 foreign laboratories.

Table 1. Subtypes of low pathogenicity AIV or specific antibodies detected in non-commercial poultry/birds, FY 2007.

State	Species	Subtype of AIV*	Antibody Subtypes
Arkansas	Swan		Multiple
California	Amazon Parrot	H5N2**	
Florida	Chicken		H10
	Waterfowl		Multiple
Kentucky	Guinea fowl		H10N7
Massachusetts	Swan		Multiple
Minnesota	Pheasant		H3N2
New York	Quail		H5N2***
Ohio	Duck, Guinea fowl		H5N2, H4N2
Pennsylvania	Chicken		H5N2***, H11N2,5, H?N2
	Duck	H11N2	H1,4
	Pheasant	H9N2	H10N7
South Dakota	Goose		Multiple

*Low pathogenicity AIV by the chicken pathogenicity test.
**Bird confiscated by U.S. Fish and Wildlife Services
***Pretesting for live bird market

Update on National Animal Health Surveillance System, National Surveillance Unit, and National Animal Health Reporting System

Aaron Scott
National Surveillance Unit

During the last several months a number of changes have occurred at the Centers for Epidemiology and Animal Health (CEAH). The primary organizational changes are the creation of an office of Collaboration and International Coordination, moving the Risk Analysis Team to report to the Director of the Center for Emerging Issues, and a few new functions. The National Surveillance Unit is the fourth CEAH center and over the last couple of years has been buried with the surveillance-related work needed by VS and our industries. One significant outcome of the reorganization will be a significant increase in National Surveillance Unit (NSU) staffing and accelerated planning and development of the National Animal Health Surveillance System.

The National Animal Health Surveillance System (NAHSS) began as a concept in the minds of many people thinking toward the future needs of our industries to facilitate trade, policy decisions, consumer confidence, and informed policy decisions. Some of the outcomes of the concept were recommendations of the 2001 safeguarding review, a USAHA resolution to build a comprehensive NAHSS, the NAHSS Steering committee, and finally the NSU– the first unit in VS wholly dedicated to surveillance. Way back when, McCluskey conceived the idea of "the Survey-ilator" – a machine centered in the middle of the United States that would detect any disease, anywhere, and in any animal. We laughed at him. But since he was our boss, we were determined to figure out how it could be built. As it begins to mature, we are no longer calling it the "survey-ilator" – now we are thinking of it as a comprehensive and integrated NAHSS.

The NAHSS hasn't happened by accident or overnight. For over a hundred years, VS and our industries have built the one of the greatest disease control and eradication infrastructures in the world. Now, after successfully eliminating many of those diseases, it is time to shift our surveillance thinking. Can we rapidly find the disease in the U.S.– wherever it may arise? Can we make statements about our National Disease Status that will convince our trading partners that our products are safe and our consumers to buy them? Can our national policy decisions be informed by information based on actual data, support our industry, and spend tax dollars wisely for the benefit of all stakeholders? The goal of a Comprehensive, Integrated National Animal Health Surveillance System will do those things. The second step after a creating a surveillance infrastructure is developing standardized surveillance plans and National surveillance systems that are comprehensive, where applicable, across populations, species, and geography. These comprehensive systems are objective-based tools in that the information to be received from them directly supports the purposes of the surveillance system. Integration of the National systems is the step that looks for efficiencies in budgeting, sampling strategies, laboratory processes, database and IT management, and analytic and reporting methods. During the integration of surveillance, it is imperative that the objective based goals are not lost or diluted by the need for cost efficiency. Finally, by applying the tools of standardized and objective-based approaches to national surveillance, a comprehensive integrated NAHSS will result.

As the NAHSS develops, it is important to recognize it as a chain of partners, each with a role and contribution to the final product– information to support policy decisions, trade markets, consumer confidence, and a healthy industry. Each link is of critical importance in that if any link in the chain is broken, the system fails. The NAHSS is growing up but with a few bumps in the road– there have been those moments!

BSE is an example of a how a Comprehensive National Surveillance System can work. In 2003, the beef industry in the U.S. took a hit to the tune of about 2.5 to 3 billion dollars in trade and consumer markets. A concerted effort was taken by industry, APHIS, FSIS, and States working together to develop a National Surveillance plan, collect samples, develop and use a network of electronically linked laboratories, and build data systems – all in a very short time. The data from this system were analyzed– that is translated into information to help convince consumers to buy the products and trading partners to reopen markets. As this surveillance system continues to develop, the data are continually being used for national policy and trade negotiations. The take home message is that this national system was built by many partners with a chain of actions that resulted in the ability to confidently make statements about the status of the disease in the United States. The bottom line is that the investment in this National Surveillance system provided a very substantial return to our industry – a return that continues to grow.

National Animal Health Reporting System (NAHRS) update: Participation 2007 – 46 States : New Mexico and Iowa participating since January 2007. Non-participants are: Connecticut, Georgia, Missouri, and Rhode Island. NAHRS Steering Committee representation is expanded to include National Assembly Districts; AVICs; and NPIP. NAHRS Online Reporting Tool v.2 was released this fall with improved function and format of

the system. EIA Sub-committee requested an EIA reporting module. State personnel will have the option of reporting summary level EIA data monthly through NAHRS instead of annually to Equine Program staff. It underwent a pilot test Sept 2007. Excellent feedback was received and a projected release was set for Nov 2007. NAHRS Issues include: 1. Notifiable LPAI H5 and H7 (poultry) draft requires concurrence of state and federal prior to reporting; 2. Compartment vs. 'commercial' reporting; 3. NAHRS Disease Reporting Criteria—relation to OIE reporting of the 'identification of the presence of infection/infestation'.

Report of the Subcommittee on Avian Influenza and Newcastle Disease

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There have been several major developments over the past year with avian influenza (AI) and Newcastle disease (ND). Since July 2006 to June 2007, 21 countries have reported outbreaks of H5N1 high pathogenicity avian influenza (HPAI) in poultry and/or wild birds including China (Hong Kong SAR), Ghana, Malaysia, and Togo (June 2007); Pakistan (May 2007); Afghanistan, Cambodia, and Kuwait (April 2007); China, Korea (Republic of), Russian Federation, Saudi Arabia, Thailand, and Turkey (March 2007); Lao PDR (February 2007); Hungary, Japan, and United Kingdom (January 2007); Cote d'Ivoire (November 2006); Sudan (August 2006); and Spain (July 2006) (Source: FAO). Since July 2007, H5N1 outbreaks have been reported in Bangladesh, Czech Republic, Egypt, France, Germany, India, Indonesia, Myanmar, Nigeria and Vietnam. There was no repeat of the extensive H5N1 HPAI wild bird cases in the European Union during 2007 as occurred in the winter of 2006 and only a few cases in late summer 2007. Most outbreaks are resurgence of virus already endemic in some developing countries. The source has typically been from the agricultural sector, especially maintained in domestic ducks, but some outbreaks have been linked to wild bird infections. The United Kingdom experienced a single farm outbreak in January 2007, which was most likely introduced from Hungary in uncooked turkey meat shipments. In September 2007, an outbreak of H7N3 HPAI was reported in broiler breeders in Saskatchewan, Canada. In May 2006, H5N2 HPAI was reported in ostriches of South Africa.

The major exotic poultry disease around the world is Newcastle disease (ND). For the period of July 2006 to June 2007, 60 countries reported ND cases. Many countries in the developing world have endemic ND and do not report occurrences of ND.

USDA/APHIS has two docket items for new regulations:

1. APHIS-2007-0014-0001 Importation of Table Eggs From Regions Where Exotic Newcastle Disease Exists, and
2. APHIS-2007-0033-0001 Agricultural Bioterrorism Protection Act of 2002; Biennial Review and Republication of the Select Agent and Toxin List; Proposed change to adopt World Organization for Animal Health (OIE) definition of virulent NDV so the Select Agent would be virulent Newcastle disease virus rather than Newcastle disease virus (velogenic).

The 7th International Symposium on Avian Influenza (AI) will be held at the University of Georgia, Athens, Georgia, on April 5-8, 2009. Currently, the conference is sponsored by Agricultural Research Service (ARS); Cooperative State Research, Education and Extension Service (CSREES); and Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture (USDA).

The proceedings of the 6th Symposium were published as a Special Issue of Avian Diseases in Vol. 51, Supplement 1, pages 157-514, 2007. The proceedings of the 1st to 6th symposia are available from the American Association of Avian Pathologists for a nominal fee (AAAP@uga.edu, http://www.aaap.info/educmat/). Proceedings of the 1st to 6th symposia are available as a CD. The 5th and 6th proceedings are available on line and as hard copies.

Detection of High Pathogenicity Avian Influenza H7N3 Subtype in Saskatchewan, 2007

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On September 22, 2007 a commercial broiler breeder producer from a sparsely populated poultry area in southern Saskatchewan reported a marked increase in mortality in a 24-week-old flock of spike roosters. On September 23, a consulting poultry extension veterinarian performed post-mortems and found lesions consistent with avian influenza. Federal officials were notified, the premises were quarantined and samples were submitted to the National Centre for Foreign Animal Diseases in Winnipeg. On September 25-26, virus isolation and molecular sequencing identified a highly pathogenic H7N3 subtype. Serological results and epidemiological investigation suggest that the spike males may have been infected by breeder hens in adjacent houses that may have harbored a low pathogenic strain of the virus. The World Organization for Animal Health (OIE) was notified of the laboratory findings on September 27, 2007. Depopulation of poultry at the affected premises, on-site disposal, movement controls and aggressive surveillance were implemented. Weekly surveillance in the 3km, 10 km and representative sampling in the rest of the control area have revealed no further evidence of exposure in commercial or backyard poultry thus far. Preliminary epidemiological and laboratory findings support the hypothesis of virus introduction through wild birds. This incident represents a second recent example in Canada of detecting a high pathogenicity avian influenza virus through passive surveillance very soon after it has mutated from a low pathogenicity molecular form. Although passive surveillance plays a critical role in detecting notifiable avian influenza the need for early detection systems in more densely populated poultry production regions remains.

Research Update on Exotic and Emerging Poultry Diseases

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SUMMARY: Exotic and emerging diseases of poultry continue to be a threat to U.S. poultry. Studies over the past year have demonstrated: 1) cooking poultry meat at minimum of 70C kills avian influenza (AI) and Newcastle disease (ND) viruses in a few seconds, 2) low pathogenicity (LP) AI viruses isolated from free-living aquatic birds of North America over the past few years are distinct from the high pathogenicity avian influenza (HPAI) virus of Europe, Asia, and Africa, 3) experimental infection of waterfowl with H5N1 HPAI virus show that swans and geese are susceptible to the lethal effects of the virus but some duck species show minimal infection and no disease, 4) flies can be a source of ND virus dispersion from infected to susceptible poultry, 5) multiple genes in addition to the fusion and hemagglutinin/neuraminidase genes are involved in high virulence of velogenic ND viruses, 6) type 1 paramyxoviruses isolated from wild birds in North America are genetically diverse and have been a source of infection for poultry in the live poultry market system, 7) a polymerase gene primer set for real-time RRT-PCR test was developed that detects class 1 ND viruses, 8) real-time reverse transcriptase polymerase chain reaction (RRT-PCR) test for AI virus has been improved to eliminate PCR inhibitors in test samples and detect new H5N1 variants, 9) ducks are able to upregulate cytokine response of innate immunity and be protected from H5N1 HPAI virus as compared to chickens, 10) astroviruses, rotaviruses and reoviruses are common in intestines of turkeys and broilers in the United States, and 11) parvovirus was identified in turkeys with enteric disease.

Cooking kills highly pathogenic avian influenza (HPAI) and Newcastle disease viruses (NDV) in poultry meat. HPAI viruses can be present in the meat of infected poultry and a prior study demonstrated cooking was effective in killing an H5N1 HPAI virus. Two additional HPAI viruses (H5N2 Pennsylvania/83 and H5N2 Texas/04) and two Newcastle disease viruses (avirulent Ulster and virulent California/02 strains) were tested for thermal inactivation in naturally or artificially infected meat. Cooking at 70C or 73.9C (165F) was effective at killing the viruses in less than 1 minute. Therefore, proper cooking of poultry using the FSIS salmonella standards would be effective at killing both AI and Newcastle disease viruses.

Wild Bird Avian Influenza Monitoring. Wild bird monitoring continued with 4922 samples received and 6230 samples processed (including samples received in 2006) between Jan 1 and October 1 2007. Virus isolation results are pending. Several H5N1 low pathogenicity viruses from North American wild birds were characterized and found to be antigenically and genetically diverse, but distinct from Asian H5N1 viruses and no clinical disease was caused by isolates that were characterized *in vivo*.

HPAI viruses cause severe disease in swans and geese. Since 2002, H5N1 HPAI viruses have caused mortality in numerous species of wild aquatic birds in Asia and Europe. In collaboration with Southeastern Cooperative Wildlife Disease Study (University of Georgia), five species of wild ducks were intranasally inoculated with an Asian strain of H5N1 HPAI virus. The wood duck was from 2-4 times more susceptible to infection than chickens, a species highly susceptible to the virus. Mallards (*Anas platyrhynchos*), northern pintails (*Anas acuta*), blue-wing teals (*Anas crecca*), and redheads (*Aythya americana*) were less sensitive to infection, produced virus in low concentrations for short periods of time, and did not exhibit clinical signs. The data suggests that the wood duck would represent a sensitive indicator species for H5N1 HPAI should it enter North America.

Isolation of exotic Newcastle disease (END) virus from field-collected and experimentally infected flies. Animal operations provide an ideal breeding environment for flies and other insects that are ubiquitous in those facilities and there is concern that these insects can transmit viruses between far To assess the potential role of flies in the dispersion of END virus, virus isolation assays were conducted on flies collected on premises with END virus infected chickens and on experimentally infected flies. END virus was isolated from three of the nine fly species recovered by sweep netting at two premises with END virus infected backyard chickens during the END outbreak in California during 2003, and END virus was also recovered from house flies and little house flies for three days after they were given END virus contaminated food. The isolation of END virus from field-collected and experimentally infected flies demonstrates their potential role for dispersion of virus from infected to susceptible birds. Biosecurity measures should include an aggressive vector control program on premises where flocks are being depopulated and on those with susceptible poultry to prevent transmission of END virus by flies.

Contribution of Genes of Newcastle Disease Virus to Pathogenicity. A major factor in the pathogenicity of Newcastle disease virus (NDV) is the amino acid sequence of the fusion protein cleavage site, but the role of other viral genes that contribute to virulence and different clinical forms of the disease remain undefined. To assess the role of other NDV genes in virus pathogenicity, a reverse genetics system was developed using the mesogenic NDV Anhinga strain to provide a backbone for generating gene mutations or

gene exchanges in attempts to enhance or attenuate the virulence of that virus. Chimeras created by exchange of the Anhinga Hemagglutinin-Neuraminidase (HN) gene with HN genes of neurotropic and viscerotropic velogenic viruses produced no significant change in virus pathogenicity as assessed by conducting the mean death time and intracerebral pathogenicity index assays and by inoculation of susceptible day-old specific pathogen-free (SPF) chickens. Inclusion in the recombinant construct of homotypic F genes, obtained from the parental viruses, also failed to enhance the pathotype of the recombinant viruses to a velogenic pathotype. A HN gene exchange alone within the context of the NDV Anhinga backbone failed to increase virus virulence from mesogenic to velogenic pathotype and suggests a multigenic role for NDV pathogenicity.

Characterization of genetic diversity in U.S. endemic Newcastle disease virus (NDV). NDV is frequently recovered from wild bird species, but little is known about the distribution, genetic diversity, and the potential of those viruses to cause disease in poultry. A total of 300 NDV isolates collected during 1986 to 2005 in the U.S. from apparently healthy waterfowl and shorebirds were used to characterize the distribution of genotypes of endemic viruses and their potential for virulence. Phylogenetic analysis of the fusion protein identified 9 novel genotypes among the class I viruses and new subgroups among genotypes I and II of the class II viruses. This study is the first long term study of the diversity of NDV in North American waterfowl and the relationship of these endemic viruses with viruses from live bird markets. The information is expected to impact surveillance and diagnostic methods.

Phylogenetic characterization and development of a real-time RT-PCR (RRT-PCR) test for Class I Hong Kong Newcastle disease viruses (NDVs). NDV can be classified into two different groups based on genetic sequence, either Class I or Class II NDV. Class I NDVs are normally present in waterfowl and in live bird markets but because of their large genetic diversity are often not detected with the U.S. validated matrix RRT-PCR diagnostic test. We sequenced the fusion protein cleavage site of 21 NDV isolates from Hong Kong live bird markets, conducted phylogenetic characterization, and developed an alternative real-time RT-PCR assay targeted to the polymerase gene, which complements the U.S. matrix gene assay. Phylogenetic analysis and preliminary RT-PCR tests suggest that the newly developed assay can detect a majority of class I isolates from the U.S. These will permit the sequencing, phylogenetic characterization, and prediction of the virulence potential for Class I viruses isolated in the United States.

Avian Influenza RRT-PCR improvements. Real time RT-PCR (RRT-PCR) is a high throughput molecular diagnostic test used for rapid detection of Avian Influenza virus (AIV) in clinical samples. However RT-PCR inhibitors present in the sample can adversely affect the performance of RRT-PCR. Several commercial RNA extraction kits were evaluated but none removed all of the RT-PCR inhibitors from cloacal swabs and tissues from clinical samples. A modified MagMAX-96 AI/ND viral RNA isolation procedure was developed (MagMAX, Ambion) for the efficient extraction of RNA from cloacal swabs and tissues. RRT-PCR was carried out in the presence of an internal positive control to detect inhibitors in the sample.

The current RRT-PCR H5 tests have been shown to miss the Fujian-like lineage of viruses because of nucleotide changes at the probe site. Two different approaches were used to solve this problem: the annealing temperature was reduced, and changes were introduced in the probe making it less specific at select nucleotide positions. Both methods improved sensitivity and specificity, but the change in the probe sequence appeared to give the best results as is being recommended.

Pathogenicity of H5N1 HPAI virus in ducks and chickens. Following infection with Asian H5N1 avian influenza (AI), differences in pathogenicity between chickens and ducks have been observed. Chickens normally succumb to disease within 2 to 3 days after infection, while ducks, which are considered natural reservoirs for AI, have rarely displayed clinical signs of disease. In vivo innate immune responses differed between chickens and ducks. Based on the results of these studies, differences in innate immune response may play a role in understanding the pathogenesis of AI viruses in both chickens and ducks. Our studies indicate ducks are able to up-regulate cytokine expression, which correlated with protection from disease. In contrast, chickens displayed suppressed innate responses, which correlated with susceptibility to disease. Understanding the mechanisms for cytokine induction and suppression following HPAI infection will provide insights into the molecular interactions of AI within avian species.

Enteric viruses in chickens and turkeys. Enteric diseases cause substantial economic losses to the US poultry industry. In turkeys, poult enteritis complex (PEC), also known as poult enteritis mortality syndrome (PEMS) in its more severe presentation, and in chickens, runting-stunting syndrome (RSS), also called malabsorption syndrome, are the major enteric disease complexes. They are considered to be multifactorial diseases and many different viruses have been isolated from the intestinal contents of affected poultry flocks. A longitudinal survey to detect enteric viruses in intestinal contents collected from turkey commercial operations was performed using molecular detection methods. All of the commercial flocks were positive for rotavirus and astrovirus from 2 until 6 wk of age, and most were intermittently positive until 12 wk of age. Of the 96 samples collected from birds on the farms, 89.5 percent were positive for astrovirus, and 67.7 percent were positive for

rotavirus. This report demonstrates that astroviruses and rotaviruses may be present within a turkey flock through the life of the flock.

Intestinal samples were also collected from 43 commercial broiler, and 33 commercial turkey flocks from all regions of the United States during 2005 and 2006, were examined for the presence of enteric viruses by molecular tests. Astroviruses were identified in samples from 86 percent of the chicken flocks and 100 percent of the turkey flocks. Both chicken astrovirus (CAstV) and avian nephritis virus (ANV) were identified in chicken samples and often both viruses were detected in the same sample. Turkey astrovirus type-1 (TAstV-1) and turkey astrovirus type-2 (TAstV-2) were both found in 100 percent and 15.4 percent of the turkey flocks, respectively. In addition, 12.5 percent of turkey flocks were positive for ANV. Rotaviruses were present in 46.5 percent of the chicken, and 69.7 percent of the turkey flocks tested. Based upon the rotavirus NSP4 gene sequence, the chicken and turkey origin rotaviruses assorted in a species-specific manner. Reoviruses were identified in 62.8 percent and 45.5 percent of chicken and turkey flocks respectively. Based on the reovirus S4 gene segment the chicken and turkey origin viruses assorted separately and were distinct from all previously reported avian reoviruses. Coronaviruses were detected in the intestinal contents of chickens, but not in turkeys. Adenoviruses were not detected in any chicken or turkeys flocks. Most flocks were positive for two or more of the viruses and overall no clear pattern of virus geographic distribution was evident. This study provides updated enteric virus prevalence data for the US using new molecular methods and reinforces that enteric viruses are widespread in poultry throughout the US, although the clinical importance of most of these viruses is unknown.

The application of a molecular screening method was designed to detect novel viruses from intestinal samples of turkeys exhibiting PE Particle-associated nucleic acid was extracted from intestinal homogenate of affected poultry, and the DNA was randomly amplified using random hexamer oligonucleotides, and PCR products were cloned and sequenced. Of 146 clones studied, 19 percent showed significant similarity to viral sequences at the amino acid level. The deduced amino acid sequences significantly matched members of the Parvoviridae family.

Recent pathogenesis studies suggest that infection with turkey-origin reovirus (TRV) can lead to immune dysfunction in poults. To this end, real-time RT-PCR assays were developed for the turkey cytokines IL-2, IL-18, IL-1β, and INF-γ in order to analyze the immune system dysfunction in poults with reovirus infections. Each assay was validated using in vitro transcribed RNA specific for each turkey cytokine and using total RNA isolated from turkey spleen. These assays will be useful in quantifying the immune response of different turkey breeds and turkeys of different ages to viral infection.

The World Organization for Animal Health (OIE) Updates

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Avian Influenza (AI). In May of 2005, the International Committee of the OIE adopted a new Code Chapter on Avian Influenza and established risk-based import measures for trading in poultry commodities. The Code Chapter addresses all highly pathogenic strains of AI as well as any H5 and H7 subtype of low pathogenicity. The chapter was slightly updated in May of 2007, which included adding backyard poultry and game fowl to the definition of poultry, as well as some specific language stating that countries should *not* place immediate trade bans on poultry commodities when a country reports detecting either low or high pathogenic AI in wild birds.

The associated appendix, which provides the recommended time and temperature parameters for the inactivation of highly pathogenic avian influenza in eggs, egg products and raw poultry meat, was also updated.

In addition, this year the OIE published two brochures (not part of the Terrestrial Animal Health Code). One brochure provides a summary of the recommendations coming out of the Verona Conference on AI Vaccination, and the other brochures provides a checklist on the practical application of compartmentalization for AI and Newcastle disease.

Newcastle disease. This year the OIE drafted a new Code Chapter on Newcastle disease. Member countries needed to comment on the proposed draft by early August, 2007. If no significant changes are made to the proposed draft chapter, it will likely be adopted during the May 2008 General Session.

Animal Welfare. No new guidelines for animal welfare were adopted this past May. However, a discussion paper addressing how any future guidelines on housing and husbandry of terrestrial animals might be addressed was shared with member countries.

Highly Pathogenic Avian Influenza (HPAI) Appraisal and Compensation

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HPAI Appraisal and Compensation: USDA Authority

The Animal Health Protection Act (AHPA), 7 U.S.C. 8301 et seq. enables the Secretary of Agriculture to prevent, detect, control, and eradicate diseases and pests of animals such as HPAI, in order to protect animal health, the health and welfare of people, economic interests of livestock and related industries, the environment, and interstate and foreign commerce in animals and other articles. The AHPA provides a broad range of authorities to use in the event of an outbreak of HPAI in the United States and to prevent the introduction of such a disease into the United States.

The United States Department of Agriculture (USDA) is the primary federal agency for incident management during a HPAI event. USDA coordinates incident management teams, manages incident response, manages public message, and takes measures to control and eradicate the disease. Measures used to control and eradicate HPAI include quarantine and movement controls, epidemiologic investigation, appraisal and compensation, depopulation (euthanasia) of affected birds, carcass disposal, cleaning and disinfection, surveillance, diagnostics, and, potentially, strategic vaccination.

Title 9 Part 53 of the Code of Federal Regulations (CFR) provides regulations for foot-and-mouth disease, pleuropneumonia, rinderpest, and certain other communicable diseases of livestock and poultry, including HPAI.

HPAI Appraisal and Compensation: Summary of the National HPAI Response Plan August 2007 - Part II. J.

The AHPA provides authority to the Animal and Plant Health Inspection Service (APHIS) to establish and implement an indemnification program to prevent or eradicate an AI outbreak. Indemnity is a key component of APHIS' disease control programs in that the promise of fair compensation for losses helps to ensure the quick and full cooperation of the owners of affected livestock. Such cooperation is central to rapid disease control and eradication. In an HPAI outbreak, it may be necessary to order the destruction of birds on or epidemiologically linked to an infected premise – either commercial or backyard – to ensure that the disease does not spread. The Secretary has the authority to pay up to 100 percent of the fair market value of the birds and for disposal and cleaning and disinfection. But it must be made clear that compensation only will be paid in cases where State and Federal animal health authorities concur with recommendations to order the destruction of birds, whether those recommendations come from industry, State, or Federal authorities.

The best practices for containment and eradication of HPAI will in many instances require a speed of depopulation, disposal, and decontamination that is more rapid than can be achieved with a slow or deliberate appraisal processes. Appraisals will not be required to be signed prior to destruction if APHIS and the cooperating State Agency agree that the poultry must be destroyed immediately to mitigate the potential spread or potential amplification of HPAI virus during a response to a confirmed or presumptive HPAI incident. All data that are required to determine fair market value will be collected prior to depopulation, including a complete inventory of birds being destroyed.

APHIS has recently published an Interim Final Rule 1 to increase indemnity for H5/H7 low pathogenic avian influenza (LPAI) viruses, adding parts 56 and 146 to Title 9 of the CFR. Section 56 deals with indemnity payments for H5/H7 LPAI. In 9 CFR 56.8 *Conditions for Payment*, a formula is described for distributing indemnity between owners and growers. Indemnity distribution between owners and growers will follow the formula set out in 9 CFR 56.8 or as set forth in any forthcoming changes or revisions to the interim final rule.

Appraisal Procedures

The immediate purpose of the appraisal process is to determine the fair market value of domesticated birds and other livestock and materials to be indemnified. The goal is to provide fair market value indemnity payment to owners and contract growers of domesticated birds, other livestock, and materials requiring destruction to prevent the spread of HPAI virus. Appraisal schedule valuations developed by APHIS from market and industry information will be used in most instances to calculate the fair market value for domesticated birds, other livestock, or materials requiring destruction. Additional appraisal methods may be offered in instances where domesticated birds and other livestock do not fit the averages on which valuations are based.

Preliminary Inventory

Once a Foreign Animal Disease Diagnostician (FADD) or designated official has determined that domesticated birds and other livestock and/or materials on a premises have been infected or contaminated by or

exposed to HPAI virus, a preliminary inventory made of the domesticated birds and other livestock and materials is taken and then this information is entered into the Emergency Management Response System or other acceptable database. In this capacity, the FADD serves as a liaison with the Appraisal Unit to identify the domesticated birds and other livestock and materials to be appraised.

The Appraisal Unit Leader should check with the animal owner to determine whether any high-value (i.e., unique, special, exotic, or purebred) domesticated birds and other livestock are present before sending an Appraisal Team to the premises. If domesticated birds and other livestock are present, the Appraisal Unit Leader should contact the Emergency Management Compensation Specialist to discuss the situation, including any special documentation required from the owner. The Appraisal Unit Leader should then inform the Appraisal Team how to handle the situation and if a special expert appraiser will be part of the Appraisal Team.

Coordinating Appraisal Activities

The Appraisal Unit Leader should determine the order in which domesticated birds and other livestock and materials will be appraised. In general, domesticated birds and other livestock should be appraised first, and materials including animal products and feed should be appraised last. The goal is to perform appraisal before depopulation, unless predetermined fair market compensation has been accepted.

1. http://a257.g.akamaitech.net/7/257/2422/01jan20061800/edocket.access.gpo.gov/2006/pdf/06-8155.pdf; Section 56.8, Conditions for payment.

2. A study by the University of Delaware and the University of Maryland has shown that composting temperatures reach approximately 140oF after 2 to 3 days. Senne et al. (1994) found that HPAI virus was inactivated at the end of the first 10 days of composting.

Conducting an Appraisal

The appraisal process consists of a number of steps or tasks, each of which is essential to a successful appraisal and prompt owner compensation. Some key tasks are outlined below:

- Determine the correct name and address of the owner(s) of the domesticated birds and other livestock on the premises and record this information on VS Form 1–23.
- Make sure what is eligible for compensation before proceeding with the appraisal.

Allowable claims include:

- Domesticated birds and other livestock destroyed due to infection or exposure to HPAI virus.
- Materials destroyed due to contamination or exposure to HPAI virus.

USDA will not allow claims involving:

- A payee who has not complied with all quarantine requirements.
- Expenses for the care and feeding of domesticated birds and other livestock held for destruction.
- The destruction of domesticated birds and other livestock or materials unless these have been appraised as described in Part II, Section J, or the owner has signed the VS Form 1–23.
- The destruction of domesticated birds and other livestock or materials that have been moved or handled in violation of a law or regulation.

It should be noted that USDA-APHIS-VS will not provide indemnity for other losses associated with extended periods of downtime due to disease situations. USDA and its State partners will work expeditiously to complete necessary disease control response actions so that, to the extent possible, downtime is minimized.

- Appraisal of the fair market value of domesticated birds and other livestock is estimated using fixed rate valuation, sales comparison approach, cost-of-production approach, or income approach. (See Appendix G for definitions of appraisal methods.) When appraising an animal, the Appraisal Team should consider the purpose for which the animal is being reared as well as its age, conformation, physical condition, and potential production.
- Appraisal of materials such as products from domesticated birds and other livestock (e.g., eggs), housing units, bedding, feed for domesticated birds and other livestock, farm equipment, clothing, articles stored in or adjacent to barns or other structures, and other items (e.g., board fences and wooden feed racks).
- Materials to be appraised and destroyed will have been contaminated by or exposed to diseased domesticated birds and other livestock and will be incapable of being cleaned and disinfected adequately. Inputs, such as feed, and outputs, such as eggs, should be appraised using the sale comparison approach. Permanent assets, such as fences and barns, can be appraised using the cost-of-production approach with depreciation.
    - Ensure that the owner or owner's representative(s) is aware of the Owner-Claimant Mortgage Certification on VS Form 1–23 concerning liens and mortgages. The Owner-Claimant Mortgage

Certification is to be signed by the owner and by each person holding a mortgage on the domesticated birds and other livestock or materials.

- Obtain an accurate inventory of domesticated birds and other livestock and materials to be destroyed for which indemnity will be paid.
- Complete forms, catalogue any visual records, crosscheck information and process for approval.

Appraisal Disputes

Disputes over appraisal and compensation will not delay the destruction of domesticated birds and other livestock and materials. USDA is authorized by the AHPA to seize domesticated birds and other livestock and materials to prevent the dissemination of the pest or disease, and the owner is required to follow the order of the Secretary. Owners and contract growers who wish to dispute the appraisal may appeal the evaluation. USDA will cooperate to promptly resolve any appraisal disputes.

Processing Indemnity Checks

Finance/Administration Section personnel will check the VS Form 1–23 and will then complete the "Indemnity Claim Transmittal" (VS Form 1–31). Under normal circumstances, after final approval, the package is forwarded to USDA-APHIS-VS, Marketing and Regulatory Programs Business Services, for final processing.

Alternative Processing

During a major HPAI outbreak, alternative indemnity payment processes may be used to expedite owner compensation. Upon reporting to the Field Operations Center, the Appraisal Officer should contact the Finance/Administration Section Chief to determine locally arranged procedures for processing the VS Form 1–23.

HPAI Appraisal and Compensation: *Summary of the National HPAI Response Plan August 2007 - Appraisal Methods, Appendix G.*

Fair market value is most effectively determined when a sale occurs between a knowledgeable and willing buyer and seller. Obviously, the destruction of an owner's birds/livestock is not a sale between a willing buyer and seller, so fair market value must be estimated. An appraisal is an estimate of what an animal is worth or the price it would have received if it had been sold. Special consideration may be needed to establish the fair market value of species of birds/livestock of valuable genetic stock.

The sales comparison approach is a method for determining value where the appraiser uses information from recent sales of comparable properties to form an opinion of the value of the subject property (the animal being appraised). Ideally, comparable properties match with the subject property in major characteristics; however, this may not always be the case. When there are some differences in major characteristics, the appraiser must make adjustments to the values of the comparable properties to estimate the value of the subject property. When using the sales comparison approach, it is important to base the estimated sale price on what the owner would receive for his or her birds/livestock at the farm.

Sometimes, only retail prices are observed (as is the usual case with pet birds or pet fish). However, the sales comparison approach method is not an effective method for estimating fair market value when market prices are not observable or reflective of true value due to the low number of birds/livestock traded. When the sales comparison approach method cannot be used, two other appraisal methods are available: the cost-of-production approach and the income approach. Both approaches require detailed knowledge of production costs.

The cost-of-production approach assumes that an asset should have worth at least equal to the cost to produce it. The cost-of-production approach can also be used to estimate value of breeding stock to the point of sexual reproduction; e.g., egg laying in poultry and piglets in swine.

The income approach is an appraisal approach that incorporates the value of future production into the value of the asset (birds/livestock). Asset value is a function of both revenues and costs associated to produce the revenues. Since the income approach incorporates future production, there is no payment of additional indemnity for lost egg production.

A Synopsis of Low Path Avian Influenza Outbreaks in West Virginia and Virginia in 2007

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On March 29, 2007 a flock of 25,000 forty-pound turkeys on a farm in West Virginia was found to be serologically positive by the agar gel immunodiffusion test for avian influenza during routine preslaughter monitoring. Several months later, on July 6, 2007, similar results were reported for a 24,000-bird flock of forty pound turkeys located in the Shenandoah Valley, Virginia. This farm also contained 30,000 three-week-old birds. In both cases swabs were immediately submitted for real-time polymerase chain reaction (rtPCR) testing and virus isolation. Both flocks were reported to be matrix positive after 35 cycles on the rtPCR test and both sets of swabs were subsequently reported to be negative for virus isolation. A low pathogenicity H5N1 virus was isolated from follow-up samples in the Virginia case. Virus was never isolated from the West Virginia case although sequence information from the PCR product indicated that the seroconversion was due to a low path H5N2 virus. Both viruses were believed to be of wild waterfowl origin.

In both incidents the decision was made to depopulate the farms and dispose of the animals by composting on the farm. As this was the first test of the Low Path H5 and H7 Avian Influenza Plans in both Virginia and West Virginia, there were things that went very well and there were opportunities to improve the response in future breaks.

The two most positive outcomes from these incidents were the cooperation that occurred between companies in dealing with depopulation and disposal and the use of foaming as a depopulation method. The application of foam was not without problems, but consideration must be given to the fact that this was the first time this procedure had been applied in large scale to animals of this size. By all accounts, after the logistics of foam application were worked out, the process was quick and efficient.

As with any new program or procedure, several opportunities for improvement can be identified. These include:

1. Diagnosis – The objective of preslaughter surveillance needs to be evaluated. If we are trying to identify flocks that have been exposed to avian influenza during their lives, antibody testing is appropriate because it represents a historical record of what has occurred during the life of the flock. If, however, our objective is to identify flocks with active infections in order to prevent spread of disease during movement, perhaps one of the newer rapid antigen detection tests should be considered as the test of choice.
2. Execution of depopulation and disposal: In the West Virginia incident the affected company was responsible for depopulation and disposal. While this was an efficient method, the downside was that the procedures tied up virtually all of the manpower from that company and they were not able to accomplish other surveillance testing in a timely fashion. In the Virginia break, depopulation and disposal was handled but a commercial company. This also was efficient but expensive. A third option that has been discussed is a regional response team consisting of personnel from companies in the area. Regardless of which option is used, efficient response dictates that decisions and training be made in advance.
3. Appraisal for indemnification: In the Virginia case, a significant delay occurred due to a requirement that the birds be appraised before depopulation could occur. It would seem that for mainstream commercial birds it would be possible to document the number of birds involved and their size and proceed with depopulation before the monetary value of the birds is officially determined.
4. Disposal: In neither of the incidents was there a pre-determined plan for disposal of the animals. Just as commercial operations are required to have pre-approved nutrient management plans, it would seem prudent to have pre-approved disposal plans for the worst case scenario of the maximum capacity of market aged animals that can be expected for that farm. The plan should include method of disposal and acquisition of materials, equipment and manpower to complete the disposal in an efficient manner.
5. Controlled Slaughter: In neither incident was the option of controlled slaughter discussed. In cases such as the West Virginia incident where no virus was ever recovered, it would seem that controlled slaughter might have been one option to save the taxpayers of the United States significant money yet not represent a threat to other animals.

In both of these incidents, it might be argued that the significant expenditure of the taxpayer's money may not have been necessary. In any new program, such as the low path H5-H7 program, there is going to be a learning curve and many opportunities for improvement. Future success of the program depends on thorough examination of the successes and failures in each incident with the intent of building on the successes and fixing the failures.

Update on the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Wildlife Services (WS) Wildlife Disease Surveillance and Emergency Response Program FY 2007 Highly Pathogenic Avian Influenza (HPAI) Surveillance in Wild, Migratory Birds Accomplishments

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As part of the government-wide National Strategy for Pandemic Influenza, the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Department of Interior (DOI), and State Wildlife agencies provided leadership in conducting surveillance for the early detection of highly pathogenic avian influenza (HPAI) starting in 2005. Within APHIS, Wildlife Services (WS) was delegated the responsibility for plan development, implementation, and oversight. WS, in collaboration with State Wildlife Agencies, DOI, and Department of Health and Human Services, and other entities such as the Southeastern Cooperative Wildlife Disease Study (SCWDS), developed An Early Detection System for Highly Pathogenic H5N1 Avian Influenza in Wild Migratory Birds, U.S. Interagency Strategic Plan. This plan was developed through an interagency effort, and represented the largest coordinated wildlife disease surveillance effort ever implemented.

International Efforts

With the assistance of USDA-APHIS, International Services (IS), USDA Foreign Agricultural Service (FAS), and several non-governmental organizations, WS has achieved significant accomplishments and results regarding a variety of HPAI issues in wild, migratory birds. Issues related to developing wild bird surveillance plans, conducting workshops on bird capture, identification, and sampling, epidemiology, data management and diagnostics activities, and conducting in-country surveillance have yielded beneficial results. For example, IS and WS collaborated with the Wildlife Trust Alliance to implement the HPAI surveillance system in Mexico. Wild, migratory birds were sampled at 26 different wetland sites with assistance from USDA. The collection of the subsequent 4,500 bird samples from 50 species improved the North American surveillance system and added protection to the US should the virus become established or detected in South and Central America. Through collaboration with FAS, WS and the University of Saskatchewan are bolstering surveillance in the Central Flyway to sample an additional 1600 wild, migratory birds. This support comes as a request from the Central Flyway Council. Additional surveillance agreements in Russia and Greenland have also helped trace virus movements and provide a more robust early detection system. The Russian, Danish/Greenland, and Canadian projects truly provide information on the potential movement of H5N1 into North America. These surveillance efforts coupled with programs in China, Cambodia, Lao, Indonesia, Philippines, Vietnam, Thailand, Argentina, Chile, and Brazil have helped APHIS improve the biosecurity of the United States concerning HPAI, and have laid the groundwork for improving disease surveillance in wildlife worldwide.

Domestic Efforts

The initiative is divided into two phases. The initial phase addresses early detection activities in Alaska, and in particular, coastal areas that have the most potential for contact among Asian and North American birds. The second phase addresses subsequent HPAI detection activities in four major North American flyways and relies on fall migration to move wild, migratory birds further south for an improved surveillance design. The plan for wild bird surveillance includes several interrelated components, including: the investigation of morbidity/mortality events; the sampling of live-captured birds; the deployment of sentinel species; environmental sampling; and sampling hunter-harvested birds.

APHIS is collaborating with other federal agencies and state officials to conduct surveillance in wild, migratory birds and cross training to improve surveillance strategies. To date, over 110,000 wild birds and 60,000 environmental samples have been tested for HPAI through the APHIS funded program. DOI and others have tested approximately 30,000 wild birds to date. The current year's APHIS plan is to collect and analyze 50,000 wild birds and test 25,000 environmental samples through a targeted surveillance approach. Detailed information can be found in WS' Implementation Plan for HPAI Surveillance in Wild Migratory Birds in the United States. The targeted surveillance approach will provide a better protective measure for the early detection of HPAI by sampling high value species using live-wild bird and hunter-harvest methods. Additionally, environmental fecal sample collection will be focused in high-use areas of migratory birds. This targeted approach leads to cost efficiency by collecting smaller sample sizes while maintaining integrity of the science-based approach.

While targeted-surveillance using live-wild birds, hunter-harvested birds, and environmental sampling is an important component of the surveillance effort, sampling morbidity/mortality events remains the most important sampling method in the program. It is highly recommended that all morbidity/mortality events in wild birds be

evaluated for HPAI sampling, regardless of the species involved. To facilitate and improve the reporting of these types of events, WS has implemented a reporting system to answer calls and inquires from the public regarding dead or sick wild birds. The toll-free number, 866-4-USDA-WS, has been published on the APHIS website and popular literature to support public inquires and help expedite calls. The calls are being tracked through an on-line system to monitor any potential increases in dead or sick bird reports. A protocol and decision tree has also been developed to help triage reports of dead or sick birds. The protocol is a step-by-step guide to determine if sampling should be conducted or whether disposal is the best option. WS has partnered with many State Wildlife Agencies to help triage the calls.

In partnership with all 50 State Wildlife Agencies, WS accomplished a majority of sampling during 2006 fall migration and on wintering grounds of migratory birds, but efforts have continued through 2007 spring migration and breeding ground surveillance. Currently, surveillance activities are being increased during the current fall migration. Surveillance is conducted in all 4 major flyways - Pacific, Central, Mississippi, and Atlantic; all 50 States, Guam, and Puerto Rico; and foreign countries. Diagnostic testing of all wild bird samples collected in the U.S. is conducted through 45 National Animal Health Laboratory Network (NAHLN) laboratories and environmental samples are tested at WS' National Wildlife Research Center. Confirmatory testing of all samples is conducted at the National Veterinary Services Laboratories (NVSL), Ames, Iowa. All wild bird samples are being submitted to laboratories in the NAHLN for initial screening using real-time, reverse transcription-polymerase chain reaction tests. Following these tests, matrix and H5/H7 positive samples are sent directly to the NVSL for additional testing including virus isolation, subtyping, and molecular sequence characterization.

WS immediately notifies the appropriate State Wildlife Agency and DOI of NVSL test results for presumptive positive H5/H7 samples collected in the USDA program via email. In the case of presumptive H5N1 test results, WS notifies the State Wildife Agency by telephone call to the State designated contact. VS notifies the State Veterinarian and the NAHLN laboratory of results.

To date, 33 presumptive positive and/or confirmatory test results for the low pathogenic H5N1 avian influenza in 13 States: Illinois, Maryland, Michigan, Montana, New York, Ohio, Delaware, South Dakota, Missouri, North Carolina, New Jersey, Pennsylvania, and Vermont. In all cases, genetic testing at NVSL ruled out the presence of the strain of HPAI that is circulating overseas. During the 2006 biological year, 253 low pathogenic H5 avian influenza viruses were detected in wild, migratory birds. To date during this biological year, 44 low pathogenic H5 avian influenza viruses have been detected in wild, migratory birds. Analyses of the 2006 H5 findings from wild birds are presented as a preliminary analysis.

United States Department of Interior (DOI) Surveillance of Migratory Birds for Early Detection of Highly Pathogenic Avian Influenza (HPAI) H5N1: 2006 Summary and 2007 Plans

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As part of the United States Interagency Strategic Plan for early detection of HPAI H5N1 in migratory birds, DOI conducted surveillance during the 2006 season (April 1, 2006 – March 31, 2007) and is currently engaged in the 2007 season (April 1,2007 – March, 31 2008). Surveillance strategies used by DOI include sampling of live-trapped birds (Strategy #2) and sport- and subsistence-hunted birds (Strategy #3), and avian influenza (AI) testing of carcasses from wild bird mortality events (Strategy #1). During 2006, DOI surveillance focused on sampling in Alaska, the lower Pacific Flyway, and Hawaii and United States territories and freely associated states in the Pacific while mortality investigations spanned all states and territories. During 2007, surveillance efforts expanded to include all four North American flyways. Species selected for surveillance were prioritized based on known ecology, behavior, and population movement and migration patterns and likely interactions with migratory birds from HPAI areas in Asia

Cloacal and oral-pharyngeal swabs (cloacal swabs only in 2006) from birds sampled in strategies #2 and #3, and cloacal and tracheal swabs from carcasses necropsied in strategy #1 were screened for AI at the United States Geological Survey - National Wildlife Health Center (NWHC) by matrix reverse transcriptase-polymerase chain reaction (RT-PCR) assay. AI-positive samples were then screened for H5 and H7 subtypes. Samples positive for H5 and H7 subtypes were sent to the United States Department of Agriculture (USDA) - National Veterinary Services Laboratory (NVSL) for confirmation and further characterization. Swab samples were also inoculated into chicken eggs at NWHC for virus isolation.

During the 2006 season, 27,295 wild birds were tested, representing 177 species from 11 orders of birds. Avian influenza was identified by matrix PCR in 741 (2.7 percent) of the swab samples; 23 of these were identified as H5 subtype, and 25 as H7 subtype. Virus isolation from swab samples yielded 20 H5 AI isolates; including 16 H5N2, 4 H5N3, and 3 H5N9 subtypes. Other hemagglutinin subtypes identified included H1-H8, H10, H11, H13, and H16, as well as representatives of all nine neuraminidase subtypes. In the 2007 season, samples from 8,800 birds have been submitted to date (11 October 2007), including 2,638 subsistence-hunted birds from Alaska, 5,761 live-captured birds, and 401 carcasses from mortality events. To date, 134 (1.5 percent) of the birds were positive for AI based on matrix PCR. We anticipate a total of >20,000 wild birds will be tested in the 2007 season.

Results of DOI surveillance under the Interagency Strategic Plan, combined with those from the USDA expanded surveillance, can be viewed at the NWHC-managed HPAI Early Detection Data System (HEDDS) found at http://wildlifedisease.nbii.gov/ai.

Live Bird Market System Summary, New York

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In 2006 we tested all live bird markets in the New York City area. There are approximately 90 live bird markets. There are 22 poultry dealer/transporters licensed to deliver poultry directly to New York live bird markets. Most are located outside of New York.

We have three New York based producers who supply birds for this system on a consistent basis. Occasionally we have some other small flocks that provide birds to the system. Prior to entering the live bird marketing system, birds must be tested negative for avian influenza (AI), H5 and H7 and meet certain minimum requirements. All sample collection in New York is conducted by state or federal personnel or, alternatively, the producer may hire an accredited veterinarian. This is not true in all states that supply the east coast live bird markets.

H7N2 Summary

In 2006, we conducted 928 sampling visits to live bird markets and collected over 11,300 samples. Between January 1, 2006 and April 17, 2006, we had 18 samplings that were positive for a low pathogenic H7N2. These were from 12 different markets. During this 3.5 month period seven of the 12 markets were positive only one time. These markets were negative throughout the rest of the year. Four markets were positive twice and one market was positive three times. This latter market underwent a change in ownership in early summer and has been under new management since then. There were no other findings of low pathogenic avian influenza (LPAI) H7N2 in the markets after April 17, 2006.

H5N2 Summary

Between May 10 and June 19, 2006, we identified five markets as positive for a low pathogenic H5N2. None of these markets were the same as any of the 12 markets that were positive for H7N2 earlier in the year. Trace backs that were conducted attempting to identify the farms of origin for the positive birds did not identify positive production far

On October 23, 2006, an inspector sampled a water duck (*Khaki Campbell*) as it was being delivered to a market which had just completed and passed a routine depopulation, cleaning and disinfection procedure. The pooled duck samples were positive for a low pathogenic H5N2 avian influenza virus. Environmental samples collected from the market before the birds entered the market were negative for all avian influenza viruses. At the time of delivery three pooled environmental samples were collected from the delivery truck and seven pooled samples from other birds. All were negative. The poultry dealer had just completed a voluntarily cleaning and disinfecting procedure that morning before taking delivery of these birds. Environmental samples collected at that time, before the birds arrived, were all negative for influenza viruses. This particular poultry transporter's facility and delivery vehicles were sampled 99 times (3,163 pooled samples) in 2006 and all sampling was negative save for this October 23 duck delivery.

Trace back of the positive ducks identified a source flock, Farm W, associated with a single corporation with multiple contract farms in Pennsylvania. All markets receiving birds from Farm W were immediately tested. At the time of notification regarding the Farm W trace back, Pennsylvania Department of Agriculture (PDA) was investigating suspicious findings at Farm B, another contract farm associated with the same company. PDA was unaware of Farm W's status until notified of the trace back. Later it was learned that Farm B had been sending ducks to the live bird markets during the two weeks preceding the October 23 sampling.

Ultimately a decision was made to sample all live bird markets once it became obvious that infected ducks from this corporation (Farm B and Farm W) had been entering the markets for a least the two weeks prior to the October 23 testing. A total of eight markets were found positive for the same H5N2 virus. Seven of the eight positive markets all had received deliveries from the implicated corporation within the two weeks in question.

All positive markets were depopulated, cleaned, disinfected and re-sampled. All subsequent sampling during 2006 was negative for avian influenza.

2007 Update

Since January 1, 2007, we have conducted over 600 market sampling visits, collecting over 4,600 samples. Of these, 19 samples from 11 markets were found positive for H5N2 low pathogenic avian influenza virus. We also collected over 2,900 samples from poultry delivery trucks and New York-based poultry dealer facilities during this time and found one sample positive.

The first positive market sample was collected on January 23, 2007. On February 1, a sample from the bed of a delivery truck tested H5 positive via RRT-PCR. The delivery truck belonged to the same distributor who supplied the positive ducks on January 23. Although trace back information was provided for all positive birds findings, positive flocks of origin could not be confirmed via subsequent testing when such testing was conducted. To date, April 18th was the last finding of H5N2 in any of the New York markets.

The Importance of Including Swine and Poultry Workers in Influenza Preparedness Plans

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Recent research has shown that swine and poultry workers, especially those with intense exposures, are at increased risk of zoonotic influenza virus infections. Multiple studies have found U.S. swine workers to have very strong evidence of previous infections with swine influenza viruses compared to non-exposed controls. Similarly, poultry-workers, and poultry veterinarians have been shown to be at increase risk of avian influenza virus infections. As these workers may contribute to the novel generation of viruses, serve as a bridging population in the cross-species sharing of influenza viruses, and increase the morbidity of pandemic viruses in their communities, it seems prudent to include swine and poultry workers in influenza preparedness progra Possible preventive and control interventions include: special education programs to increase workers' use of personal protective equipment such as gloves, increased surveillance for influenza viruses among workers and their animals, recommendations that workers seek medical attention should they develop influenza-like-illness, workers' priority receipt of annual influenza vaccines, and workers' priority receipt of pandemic vaccines and antivirals.

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