



## PROCEEDINGS

June 22-24, 2015

Holiday Inn Inner Harbor

Baltimore, Maryland, USA



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Additional information can be found at the conference website at:

[Avian Influenza International Conference site](http://www.aphis.usda.gov/animal-health/ai-conference)  
<http://www.aphis.usda.gov/animal-health/ai-conference>



Julie Gauthier

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### Conference Goals

- ◆ review the risks of introduction of avian influenza viruses through global trade in poultry and poultry products, and
  - ◆ discuss appropriate measures to mitigate these risks
- 



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## Program Sponsors

- National Chicken Council
- National Turkey Federation
- U.S. Poultry & Egg Association
- United Egg Producers
- United States Department of Agriculture
- USA Poultry & Egg Export Council / World Poultry Foundation

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## AGENDA

### Monday, June 22, 2015: Registration, Keynote Address, and Reception

3:00 pm	Registration
6:00 pm	<b>Welcome and Introductions</b> by Dr. John Clifford, U.S. CVO and Mr. Jim Sumner, International Poultry Council President
6:15 pm	<b>Opening remarks</b> by the APHIS Associate Administrator (Dr. Jere Dick, USDA APHIS)
6:30 pm	<b>Keynote Address:</b> Risk of introducing avian influenza through trade in live poultry and poultry products (Dr. David Swayne, USDA ARS)
7:30 pm	Reception

### Tuesday, June 23, 2015: Presentations and Panel Discussions

7:00 am	Registration
8:00 am	<b>Presentation:</b> 2015 U.S. HPAI Outbreak Situation Report (Dr. Brian McCluskey, USDA APHIS)
8:30 am	<b>Presentation:</b> Reflecting on influenza prevention and control (Dr. Carol Cardona, University of Minnesota)
9:00 am	<b>Presentation:</b> International standards for HPAI risk mitigation (Dr. Brian Evans, OIE)
9:30 am	<b>Presentation:</b> FAO's role in global HPAI control (Dr. Subhash Morzaria, FAO)
10:00 am	Break and group photo
10:30 am	<b>Panel discussion:</b> Recent HPAI experiences and perspectives (Africa and Asia 1) <sup>1</sup> (CVOs or delegates from Africa and Asia, led by Dr. Jack Shere)
12:00 pm	Lunch
1:00 pm	<b>Panel discussion:</b> Recent HPAI experience and perspectives panel (Asia 2) <sup>1</sup> (CVOs or delegates from Asia, led by Dr. T.J. Myers)
2:30 pm	Break
3:00 pm	<b>Presentation:</b> H5/H7 risk analysis update (Dr. Takehiko Saito, Japan NIAH)
3:15 pm	<b>Presentation:</b> Japanese experience in the control of HPAI (Dr. Tatsumi Okura, Japan MAFF)
3:30 pm	<b>Presentation:</b> Use of the Canada/U.S. zoning arrangement during the 2015 HPAI outbreaks (Dr. Abed Harchaoui, CFIA)
4:00 pm	<b>Presentation:</b> Official oversight of ostrich compartments (Dr. Julie-Anne Koch, South Africa MAFF)
4:30 pm	<b>Presentation:</b> Avian Influenza control strategy: the EU experience (Dr. Riviriego-Gordejo, European Commission)
5:00 pm	<b>Summarize</b> Tuesday activities; preview Wednesday agenda (Dr. Brian McCluskey, USDA APHIS)
6:30 pm	Reception

### Wednesday, June 24, 2015: Presentations and Panel Discussions

8:00 am	<b>Panel discussion:</b> Recent HPAI experience and perspectives panel (European Union) <sup>1</sup> (CVOs or delegates from European Union, led by Dr. John Glisson)
9:30 am	<b>Presentation:</b> HPAI in the Netherlands and consequences for the poultry industry (Dr. Christianne Brusckke, CVO of the Netherlands)
10:00 am	Break
10:30 am	<b>Panel discussion:</b> HPAI experience and perspectives panel (North America) <sup>1</sup> (CVOs or delegates from North America, led by Dr. Gregorio Rosales)
12:00 pm	Lunch
1:00 pm	<b>Presentation:</b> Biosecurity for live poultry in transit (Dr. Alberto Torres, U.S. Poultry and Egg Association)
1:30 pm	<b>Presentation:</b> U.S. avian influenza surveillance programs (Dr. T.J. Myers, USDA APHIS)
2:00 pm	Break
2:30 pm	<b>Presentation:</b> Trade consequences of the Yorkshire HPAI outbreak (Dr. Simon Hall, UK APHA)
3:00 pm	<b>Moderated discussion</b> session to collect summary conclusions and recommendations from the group (Dr. Rick Hill, USDA APHIS)
4:30 pm	<b>Concluding remarks</b> (Dr. John Clifford, U.S. CVO and Mr. Jim Sumner, USAPEEC President)

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## Executive Summary

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) and the U.S. poultry industry co-hosted the International Conference on Avian Influenza and Poultry Trade on June 22-24, 2015, in Baltimore, Maryland, USA. The goals of the conference were to review the risks of introduction of avian influenza viruses through global trade in poultry and poultry products, and to discuss appropriate measures to mitigate these risks.

Among the 200 participants were personnel from APHIS and other USDA and Federal agencies; State Animal Health Officials from Alabama, Arkansas, and Indiana; representatives from the European Union, the World Organization for Animal Health (OIE), the Food and Agriculture Organization of the United Nations; Chief Veterinary Officers and subject matter experts from 37 countries around the world; and representatives from the United States and international poultry industry.

Emerging from the conversation were seven key issues or themes common to trading partners affected by avian influenza:

1. complying with international standards,
2. accepting zoning or compartmentalization,
3. ensuring biosecurity,
4. accepting vaccination as an eradication tool,
5. applying appropriate movement restrictions and risk mitigations to commodities moved from or through AI-affected regions,
6. performing adequate surveillance and developing feasible control strategies for AI, and
7. exploring options for AI control in wild bird reservoirs.

Conference participants concluded that the current worldwide highly pathogenic avian influenza event is unique, requiring reassessment of prevention, control, and eradication strategies. Participants generally agreed that there is no single answer to avian influenza prevention and control, and that multiple tools, novel approaches, and case-specific strategies are needed to deal with this global event. Because of the worldwide distribution of avian influenza and wild bird reservoirs, regional (multi-national), or perhaps global coordination of private and public entities will be necessary to detect, prevent, and control avian influenza infections.

In the short term, research is crucial to find new, more efficient ways to rapidly and humanely euthanize and dispose of the very large populations (millions) of birds housed on some modern commercial poultry farms. In the long term, participants hope resources will be made available to researchers to develop methods to enhance the immunity of wild birds and domestic poultry against avian influenza infection.

Delegates from several countries shared their experiences of recent avian influenza outbreaks, and generally agreed that stamping out policies have been largely successful and remain the best response. Vaccination has been used successfully by a few countries as a measure to control spread of infection, protect public health, and mitigate the domestic economic impact of avian influenza; however, many countries currently have policies that do not allow imports from countries that vaccinate. Several delegates, including the U.S. Chief Veterinary Officer, indicated a willingness to re-examine general prohibitions against importing products from countries that practice avian influenza vaccination, in favor of aligning with OIE standards. Zoning and bilateral or multilateral agreements have been useful for continuity of trade, although zoning in accord with OIE standards has not been uniformly adopted. On the other hand, compartmentalization has not reaped significant benefits or achieved wide acceptance by trading partners.

Participants recommended that OIE review the Terrestrial Code chapters on avian influenza and on zoning and compartmentalization to ensure that the chapters are internally consistent, particularly with regard to the

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timing for an affected region to regain free status. The group also proposed that OIE develop new chapters on biosecurity standards and avian influenza-specific zoning practices; these additional chapters may provide more consistency for trading partners applying international standards to import decisions.



## Monday, June 22, 2015

Members of the organizing committee took written notes of the remarks made by the speakers. The notes were edited for clarity, reviewed, and edited by the speakers for accuracy.

### Welcome and Introductions

**Dr. John Clifford, U.S. Chief Veterinary Officer, and Mr. Jim Sumner, International Poultry Council**



John Clifford

**John Clifford and Jim Sumner welcomed the attendees from all over the world.**

Dr. Clifford: The current HPAI outbreak affecting the United States is moving around the world in migratory bird flyways. As in other parts of the world, the HPAI outbreak has devastated domestic poultry populations and producers. Fortunately, the outbreak seems to be subsiding and no new cases have been detected in over a week. APHIS and the U.S. poultry industry is preparing for fall migration of wild waterfowl that may bring infection back to U.S. poultry. The purpose of this conference is to share what we have learned and mistakes we have made, and to talk about safe global trade to help feed people around the world with wholesome products.

Mr. Sumner: I represent three different poultry industry organizations for the conference, which brought together poultry industry experts from around the world. The International Poultry Council represents 26 member countries, and includes experts from OIE, FAO, and CODEX. At the last meeting of the International Poultry Council, participants had a spirited discussion about avian influenza and developed a statement to urge trading partners to abide by OIE standards. Interpretations of OIE standards by some countries is causing serious widespread disruptions to poultry trade and affecting sustainability in poultry production. We need to apply immediately the measures of OIE code giving due regard to applicable risk to the products.

### Opening remarks by the APHIS Associate Administrator

**Dr. Jere Dick, USDA APHIS**

Thank you to the participants for their effort to attend and thank you to the sponsors. The distinguished audience includes more than 50 organizations from around the world and over 200 participants from government and industry. I encourage participants to exchange knowledge to improve trade, by looking at lessons learned and examining risk mitigations. The animal health community bears tremendous responsibility to ensure our food supply remains safe and to retain the public's trust. I hope that the animal health community can arrive at some new approaches to ensure poultry trade remains open.

The current U.S. HPAI outbreak could be the largest animal health emergency the United States has dealt with. This disease has only been detected in certain areas of the United States.

How do we ensure our poultry trade remains vigorous? Follow the OIE guidelines. These guidelines are based on sound science and support any trade restrictions they impose. Profits and jobs are lost and there are also numerous other impacts that are not as apparent. It will benefit us all to keep our poultry trade as fair and equitable as possible.

Thank you to all our trade partners for maintaining trade while we control this disease. We worked hard to provide you the scientific data to ensure the risk of HPAI introduction is mitigated.

Tomorrow we will hear special insights into the true nature of trade related HPAI risks and why evaluating those risks from a truly scientifically perspective is so important to us. Our participants from Africa, Europe, and Asia have a lot to offer. We want to learn as much as possible on how they have mitigated disease spread and to hear about what did not work.

On the U.S. side, we will share information about our National Poultry Improvement Plan and how it has helped over the years to ensure our country has experienced relatively few outbreaks.

In conclusion, I hope that we will all go away with new insights on HPAI and that the top ranked professionals here will take back the outcomes of this conference to share with their countries. We plan on summarizing these proceedings and prepare a report for the OIE. We will be sharing our lessons learned. We are refining our approach and every day we are making progress to ensure safe and secure poultry trade. We are grateful that you are partnering with us and glad for the effort of everyone to be here.

## **Keynote Address: Risk of introducing avian influenza through trade in live poultry and poultry products**

**Dr. David Swayne, USDA Agricultural Research Service**

A copy of the PowerPoint presentation is available at [http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/animalhealth/sa\\_program\\_overview?1dmy&urile=wcm%3apath%3a%2Faphis\\_content\\_library%2Fsa\\_our\\_focus%2Fsa\\_animal\\_health%2Fsa\\_animal\\_disease\\_information%2Fsa\\_avian\\_health%2Fct\\_ai\\_conference](http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/animalhealth/sa_program_overview?1dmy&urile=wcm%3apath%3a%2Faphis_content_library%2Fsa_our_focus%2Fsa_animal_health%2Fsa_animal_disease_information%2Fsa_avian_health%2Fct_ai_conference)



David Swayne

Diversification has given rise to numerous clades, which have distinct antigenic properties and virulence. In particular, clade 2.3.2.1 that dominates in Vietnam has evolved these past years into subgroups A, B, and C, which do not necessarily share cross-protection. In fact, new variants can escape immunity with vaccines based on classic strains, which raises the need for vaccine update. For example, in Vietnam, commercial vaccines Re-1 and Re-5 no longer provide protection against the new antigenic variants.

Novel avian influenza virus of Eurasian origin (EA-H5N8 clade 2.3.4.4) spread rapidly along wild bird migratory pathways during 2014. Introduction of this EA-H5N8 virus into the Pacific Flyway sometime during 2014 has allowed mixing with North American (AM) lineage viruses and generated new combinations with genes from both EA and AM origin (or “reassortant” viruses) such as the EA/AM H5N2-reassortant detected in Canada and the US. Recently, another novel virus, EA/AM H5N1-reassortant, was detected in an American green winged teal in Whatcom County, Washington and such findings are not unexpected as the EA-H5N8 virus continues to circulate.

Mean bird infectious dose (BID50) is proposed as a quantifiable laboratory assessment of a virus ability to initiate an infection in a specific species and to set the stage for virus strain adaptation and transmissibility for a specific host species. The HPAI and LPAI isolates from past large poultry outbreaks have values between 2-3 mean embryo infectious doses (EID50) compared to 4.7 EID50 for Turkey Ireland 1983 which caused a limited outbreak, for example.

HPAI virus Infected hens produce eggs with virus most often in albumin, then shell, and then yolk, in that order, although among the 3 egg samples, shell swabs contained the highest amount of virus. Vaccination (either 1 or 2 doses) significantly decreased contamination and viral load in eggs. In particular, one dose reduced viral contamination in eggs from 45% to 7%, and two doses prevented contamination completely. Vaccination significantly lowered the number of contaminated eggs and the amount of virus in them as compared to sham-vaccinated hens.

### **Conclusions:**

- Different HPAI viruses have variable infectivity and transmissibility for poultry depending on exposure and virus-host adaptation
- Risk of introduction through trade in poultry and poultry products varies with commodity
- Surveillance is key to demonstration of freedom in country/zone/compartiment
- Vaccination can be an effective mitigation tool against avian influenza
- Pasteurization and cooking are effective at inactivating HPAIV in poultry products



## Questions/Answers

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**Q Clarify which industry segments have been affected by HPAI in the Midwest?**

A Layers and some breeders. We have not done experiments in adult layers and breeders to determine the infective dose, as all studies have been in young chickens and turkeys. The difference in production species segments affected may not be so much a difference in age susceptibility but in exposure.

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**Q In 1983, there was an HPAI outbreak in Pennsylvania/Virginia. A few years after that, the region was dealing with a *Salmonella enteritidis* (SE) outbreak. Is there an association between HPAI and Salmonella and should we be bracing ourselves for this possibility?**

A No association between HPAI and SE is known. Biosecurity is important to prevent spread of both diseases.

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**Q What about poultry litter?**

A Always an important question. Litter which contains feces (manure) houses the virus. There has been a lot of experimental work and also field work on composting which is effective at inactivating influenza virus. It is very critical that litter is decontaminated before it moves off the farm. Litter is a high-risk commodity to move off a farm.



**Tuesday, June 23, 2015**

## **Presentation: Situation Report for Highly Pathogenic Avian Influenza Virus in the United States**

**Dr. Brian McCluskey, USDA APHIS**



Brian McCluskey

A copy of PowerPoint presentation is available at:

[http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/animalhealth/sa\\_program\\_overview?1dmy&urile=wcm%3apath%3a%2Faphis\\_content\\_library%2Fsa\\_our\\_focus%2Fsa\\_animal\\_health%2Fsa\\_animal\\_disease\\_information%2Fsa\\_avian\\_health%2Fct\\_ai\\_conference](http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/animalhealth/sa_program_overview?1dmy&urile=wcm%3apath%3a%2Faphis_content_library%2Fsa_our_focus%2Fsa_animal_health%2Fsa_animal_disease_information%2Fsa_avian_health%2Fct_ai_conference)

The presentation provided a briefing of the timeline of H5 HPAI introduction into the United States from 12/2014 to 6/2015 as well as maps and descriptive epidemiology of U.S. HPAI detections in commercial poultry, backyard poultry, and wild birds. Dr. McCluskey also summarized epidemiologic investigations into risk factors for infection and routes of spread, including airborne and fomite transmission.



### **Questions and Answers**

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**Q About the plume analysis, what percentage of farms is inside vs outside of plumes?**

A The analysis is in progress.

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**Q Regarding the Secure Turkey Supply Plans and the number of permits allowed, do we need to tighten up on permits? Is permitted movement spreading the virus?**

A We have done a feed truck network analysis and we are doing other analyses. There is no indication that the permitting process created any problems with moving the virus.

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**Q Is the problem created/enhanced from people moving on and off premises?**

A We have asked questions about people and vehicles coming on and off premises; the analysis is in progress.

## **Presentation: Reflections on Influenza Prevention and Control**

**Dr. Carol Cardona, University of Minnesota**

We need to reassess AI prevention, control, and eradication. Today, it is easier to show where H5 has not been found in the world than where it exists. Problems with our traditional responses to AI outbreaks include:

- Prevention strategies are hindered by competing forces, such as loss of income, markets, and protein.
- Endemic infections in various places provide challenges.
- Control strategies have not evolved to meet a new reality, such as very large poultry farms and advances in vaccine development.



## Questions and Answers

**Q What data do you have to say the incubation period is 8 days?**

A We looked at data from the Southeastern Poultry Research Laboratory and models created at the APHIS Center for Epidemiology and Animal Health (CEAH) to determine flock incubation period.

**Q You tested all backyard flocks, yet we know that they do not play any role in the epidemiology of recent HPAI outbreaks. If we find them infected, we cull them. Isn't testing all backyard flocks a waste of effort?**

A And that is how we are looking at this issue.

**Q I am also concerned about the amount of time it takes to depopulate flocks. Why does it take so long?**

A It is a difference in cage layer facilities. We need to pull birds out of cages and then kill them, which is time consuming.

**Q You talk about targeting the source, and I am surprised that you mention ducks; they are a major source of infections and we must target the source. In Southeast Asia this is a big problem, and our biggest problem is that for a long time we have promoted mixed farm premises now we are learning that they must be separated and this may be impossible.**

A All good points. There is no single answer.

## Presentation: International standards for HPAI risk mitigation

Dr. Brian Evans, World Organization for Animal Health (OIE)

A copy of PowerPoint presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/tue2\\_evans\\_int'l\\_standards\\_for\\_hpai\\_risk\\_mitigation.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/tue2_evans_int'l_standards_for_hpai_risk_mitigation.pdf)

There are no easy answers to what is being experienced; there are a number of communities actively seeking answers. "International trade is an undeclared war, and disease outbreaks are the weapon of choice."

The "three sisters" standard setting bodies of the WTO Sanitary and Phytosanitary (SPS) Committee are the OIE, the FAO Codex Alimentarius Commission, and the FAO International Plant Protection Convention (IPPC). The WTO SPS Agreement recognizes the OIE as the intergovernmental reference organization for the establishment of science based standards for animal health, animal welfare, and the safe trade of animals and animal products.

How do you ensure that your country's consumers are being supplied with food that is safe to eat — "safe" by the standards you consider appropriate? And at the same time, how can you ensure that strict health and safety regulations are not being used as an excuse for protecting domestic producers? An agreement on how governments can apply food safety and animal and plant health measures (SPS measures) sets out the WTO's basic rules.

What can the private sector do to protect world trade and consumers?

- Early detection and mandatory reporting of changes in production, behavior, and status
- Site specific biosecurity protocols with regular independent evaluations/validations (these might be pre-requisites for eligibility for compensation)
- Approved cleaning and disinfection protocols and animal disposal plans in place



Brian Evans

- Remember that zoonoses are a two way street, and lead by example by providing occupational health and safety programs, personal protective equipment, vaccination of personnel, and surveillance and monitoring programs; and by informing the public of industry standards and practices.
- Creating the environment and momentum for constructive regulatory negotiations with trading partners
- Supporting disease research (genomics, immunity, vaccines and vaccine delivery systems)
- Contributing to the standard setting process at both the country and international level
- Educating policy makers of the critical contributions to global food security, nutrition and economic performance that merit protection and investment
- Develop truthful and synergistic communications with the animal health and public health sectors and third party spokespersons. Communicate what you know, what you don't know, and what you are doing to address the latter in the public interest.

What can OIE do to promote world trade and protect consumers?

- Adapt international standards based on new science or knowledge.
- Further, refine commodity based risk parameters if biosecurity can be demonstrated.
- Consistently remind countries of their responsibilities post adoption of standards.
- Advocate for recognition and rewarding of appropriate behaviors

Emergency Management 101: Success in managing disease outbreaks is dependent on addressing three elements simultaneously and equally well: the biological event, the communication, and the relationships. OIE provides science-based standards adopted and endorsed by 180 Member Countries to support the successful management of the biological event.



## Questions and Answers

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**Q Commenter appreciates the role of OIE promoting world trade. One frustration is that OIE stays on the sidelines when it comes to conflict between two countries around trade when there is clearly unfair sanctions on trade.**

A Please encourage your Delegate to engage with us individually. We have taken a much more proactive approach when requested by the countries in conflict.

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**Q Note that on the OIE website there is no way for a country to declare itself “free” of HPAI. For example, UK should be free of HPAI, which is not reflected on the OIE website. Is there a way on the website to declare country freedom from HPAI?**

A OIE operates two websites, one public and one reserved for OIE Delegates. Disease notification reports become public once they are validated. OIE provides official disease status recognition for six diseases but not for avian influenza. There is a process for countries to make a self-declaration of freedom from avian influenza and other diseases if they can demonstrate compliance with the provisions of the relevant OIE Terrestrial Animal Health Code Chapters, which is then published in the OIE Bulletin on a quarterly basis.

## Presentation: FAO's role in global HPAI control

Dr. Subhash Morzaria, Food and Agriculture Organization

A copy of the presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/tue4\\_morzaria\\_fao\\_experience\\_in\\_asia%26africa.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/tue4_morzaria_fao_experience_in_asia%26africa.pdf)

In 2013, the United Nations Food and Agriculture Organization (FAO) published the paper *Lessons from HPAI* available at

<http://www.fao.org/docrep/017/i3183e/i3183e.pdf>

FAO concluded that HPAI spreads mostly through the actions of people and that biosecurity and other good farm management practices limit spread of disease.

Why is disease entrenched in some countries? Disease and socioeconomic status are intimately linked. Poorer countries are less able to deal with disease incursions, while economically advanced countries stamp out repeated incursions (e.g. Japan, South Korea, Malaysia, and Thailand). A range of farming systems and value chains co-exist.

Insights regarding infection and transmission dynamics:

- Wild birds are a primary source, and then significant secondary transmission occurs from farm to farm.
- Complex and dynamic in country cross border supply chains exist. H5N1, H5N6 are exchanged by cross-border trade in poultry and poultry products.
- High density of poultry and mixed species make live bird markets a major sink of viruses. Economic issues constrain management of live bird markets.

Insights regarding use of vaccination:

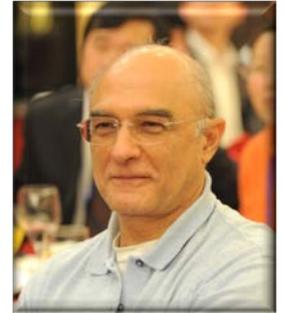
- The decision to use vaccine was driven by economics in some countries (e.g. Bangladesh, Nepal). Public health and economic concerns drove the decision to use vaccine in other countries (e.g. Viet Nam, Indonesia, and China).
- Delivering vaccine to the smallholder sector is a significant challenge, due to fatigue and breakdowns of the delivery system.
- Vaccination is often used to replace good farm management practices.
- Post-vaccination monitoring is essential but expensive.

Insights regarding support of national vet services:

- AI response competes with other priorities, such as economic development, conflicts and natural disasters, which are beyond line ministries, natural disasters, etc.;
- Awareness of HPAI is high but perception of risk is low. Socioeconomic and public health impacts need to be defined for political support.

The importance of poultry meat and poultry industry in the developing world:

- Poultry consumption increased in the region following the Ebola epidemic and ban of bush-meat.
- Poultry industry is a crucial economic component (e.g. 240 billion CFCA (US\$ 0.5 billion) in Côte d'Ivoire = 1% GDP 2013)
- Poultry farming plays an important role in the social structure and livelihoods of rural areas.
- Challenges for the developing world are development of the poultry value chain and strengthening of veterinary services including surveillance and laboratory capabilities.



Subhash Morzaria



## Panel Discussion: Africa and Asia 1

**Moderator: Dr. Jack Shere, USDA APHIS**

Panelists are from African and Asian countries that have experienced recent outbreaks of HPAI.

- Dr. Gehad Salah Mohamed Ali : Bio-security official, Central Administration of Preventive Medicine, General Organization for Veterinary Services, Government of Egypt
- Dr. Abdulganiyu Abubakar: Chief Veterinary Officer of Nigeria, Ministry of Agriculture and Rural Development
- Dr. Mpho Maja: Director of Animal Health for the South Africa Department of Agriculture, Forestry, and Fisheries
- Dr. Tatsumi Okura: Deputy Director of Animal Health Division of Japan Ministry of Agriculture, Forestry and Fisheries

### Topic: Country HPAI Situation Report

Panelists provided a brief report and lessons learned from the most recent outbreak of HPAI in their countries.

#### Egypt

- 141 human infections have been reported.
- Egypt used vaccine to control the outbreak.
- Backyard or rooftop farms are a challenge for HPAI control.

#### South Africa

- The AI outbreak occurred in ostriches, but not poultry.
- South Africa prohibits vaccination. South Africa rather encourages good biosecurity practises to its farmers, as vaccination cannot replace good biosecurity.
- Laboratories use ELISA for screening, HI and PCR for confirming.
- Biosecurity is critical. On ostrich farms, outdoor water sources are discouraged and owners requested to drain them out, drinking water is chemically treated and other measures are taken to avoid attracting wild birds.

#### Nigeria

- First HPAI outbreak was between 2006—2008 while the second was in January this year.
- 60% of Nigerian poultry population is backyard, 25% commercial while 15% is semi-commercial.
- The last outbreak affected mostly backyard flocks while the present one is in commercial flocks. It is posing serious economic challenges to the poultry industry in particular, and the Nigerian nation in general, due to the massive number of birds depopulated.

- The subtypes of the recent outbreak (H5N1) appear similar but are not the same as the first outbreak of 2006. On sequencing the virus, in the laboratory at PADOVA Italy, it is the same one that caused an outbreak in China and a case in Canada in 2014.
- A holistic, concerted, and collaborated containment strategy is being implemented with the assistance of Development Partners such as USAID, OIE, FAO, USDA, and AU-IBAR.
- Control measures taken include quarantine and movement restrictions, investigation of all suspicious cases, modified stamping out based on case definition, environmentally-sound disposal of carcasses, disinfection of premises and fomites, commensurate and timely compensation for culled birds, veterinary stockpile of essential inputs, public enlightenment campaign, intensification of active/passive surveillance, disease reporting, technical and laboratory diagnostic capacity improvements.
- It is very imperative to look at prevention, control, and eradication of the disease using a regional, continental, and global approach because of its economic and public health implications.

### Japan

- Five outbreaks have occurred in Japan; the latest was in 2014 (five cases were found last winter). These were effectively contained and did not have a big impact on the Japanese poultry industry.
- Epidemiologic investigations suggested that each of the five cases was isolated; H5N8 was introduced to Japan by wild migratory birds.
- Use of vaccination is allowed in exceptional circumstances under certain conditions of Japan's guidelines.



### Questions and Answers

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#### Q - Which countries pay for compensation to producers for destruction of infected birds?

**A** **Egypt:** no compensation; **South Africa:** compensates at market value; **Nigeria:** national government compensates 2/3 and local government compensates 1/3 (timeliness of the payment is a problem); **Japan:** yes, compensation is provided.

#### Topic: Zoning for trade continuity during HPAI outbreaks

Panelists described how each country uses zoning to continue trade during avian influenza outbreaks.

#### Egypt

- Egypt uses a compartmentalization approach to certify approximately 15 locations as AI free. The compartments must have good biosecurity practices, laboratory testing for AI, and pass inspection. After a year in the program, the facility can receive a certificate for AI freedom from the Egyptian government. The compartments must renew their certificate each year to remain in the program.

#### South Africa

- We find that zoning is not possible (or practical) for avian influenza.
- The zoning chapter and the AI chapter of the OIE Code do not talk to each other; the zoning chapter talks about restricting movements of susceptible animals and in the case of AI this should include wild birds; over and above that, there is no benefit to gain for zoning as the Zoning chapter require that a containment zone be established at least 2 incubation periods

after the last reported case (with C&D); while the country can gain freedom 30 days after stamping out (with C&D).

**Nigeria** does not practice zoning.

**Japan** Each HPAI outbreak is evaluated scientifically for zoning decisions. For HPAI, we ban imports from the state where HPAI occurs.



## Questions and Answers

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### Q Do you recognize other countries' zoning for imports?

A **Egypt:** First we look at the records for each country and if they are free of the disease or not.

**South Africa:** Countries presented us with a number of requests to recognize zoning; out of 10 applicants, only one complied with our requests for information.

**Nigeria-**We are in support of zoning for trade.

**Japan-**I think it is natural that each country's zoning is different, because each country's effort is based on their background and risk evaluation. Risk intervention must be done and be transparent and fair.

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### Q Based on the South Africa delegate's comment on the OIE code not specifically addressing zoning for HPAI, what do you suggest the OIE could do, Dr. Evans?

A **Dr. Evans (OIE) responded:** The horizontal chapter on zoning is a chapter founded on a series of principles. There is an opportunity for different interpretations and different conclusions. The zoning chapter is not flawed, but the OIE could provide more guidance on a disease level.

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### Q For the Japan delegate: We appreciate the approach of Japan when there are cases of AI, but they restrict the imports and limit to states that are NOT reporting cases of AI, but they do it only for three months. If at some point, would Japan take on the OIE guidelines regarding zoning to only a restricted area? Would they consider limiting those imports to avoid that zone?

A **Japan** delegate responded: The conditions that we impose on the U.S. were negotiated for a long time and we have come to an agreement. The conditions we are talking about here are not just what is currently happening, but also veterinary services ability to execute what has been decided and meet the conditions we agreed on. We also believe that we need to have a scientific basis to move in another direction. So as you can look at our history, we have not closed the door and we are open to consider other conditions. There may be other developments in the future.

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### Q How would your country react if the U.S. allowed vaccination in a high-risk zone? Would this be acceptable or would it limit trade to your country?

A **Egypt:** We normally follow OIE conditions for zoning and compartmentalization. In Egypt, we control immunization, and locations that use vaccination must meet our rules for biosecurity and we make sure the farms are far away from each other. We conduct surveillance around the location to make sure it is free of virus.

**South Africa:** Since South Africa prohibits vaccination, it currently does not allow imports from countries that vaccinate. Allowing imports from countries that vaccinate will be a major policy change, which would require the full process to be undertaken.

**Japan:** We require conditions for import and export with vaccination for AI. If other countries request our country to accept their vaccination program and import their products, we should conduct risk evaluations on the country.



## Panel Discussion: Asia 2

**Moderator: Dr. TJ Myers, USDA APHIS**

Panelists are from Asian countries that have experienced recent outbreaks of HPAI.

- Dr. Yongsang Kim: Director of the Veterinary Epidemiology Division, Animal and Plant Quarantine Agency, Republic of Korea
- Dr. Wen-Jane Tu: Secretary General of the Bureau of Animal and Plant Health Inspection and Quarantine, Taiwan
- Dr. Chantanee Buranathai: Senior Veterinary Officer, Senior Veterinary Officer, Bureau of Livestock Standards and Certifications, Department of Livestock Development, Thailand
- Dr. Do Huu Dung: Head of the Planning Division, Department of Animal Health, Vietnam

### Topic: Country HPAI Situation Report

#### South Korea

- We have had outbreaks H5N8, introduced from abroad through migratory birds. Stamping-out is the top priority for HPAI eradication and vaccination is prohibited in Korea. Culling of all the birds, movement restrictions of vehicles and persons, and disinfection are implemented in the infected farm. Immediate notification of suspected case and rapid implementation such as movement restrictions on risked premises are the key to HPAI eradication.

#### Taiwan

- In early 2015, goose and duck egg production dropped suddenly and abnormal rapid death were reported and diagnosed with novel H5N8, H5N2 and H5N3 subtype avian influenza virus infection. Their H5 gene sequences are most closely with the 2014 Korean duck H5N8 subtype virus and HA0 cleavage sites containing six basic amino acids indicated that they are highly pathogenic and are significantly different to the avian influenza virus that occurred in Taiwan in the past.
- A multi-ministerial Emergency Response Taskforce under the Central AI Command Center was established to take clear policy decision to combat this epidemic. As this epidemic was caused by a new HPAI virus, according to the law, the owner/keeper to notify the authority will be compensated 100% to encourage informing. Once a case was confirmed, stamping-out, clean & disinfection was conducted within 24 hours. It was required to left the farm empty for at least 21 days, pass sentinel chicken test for 21 days, have no case or all positive cases in 1 Km radius

has completed C&D and owner/keeper takes training course for biosecurity and good farming practice before resume the operation.

- To prevent the rapid spread of the epidemic, we banned movement of poultry for slaughter on January 12 to 14 and January 24 to 28 respectively. After the national movement ban left, poultry/eggs need to have a health/fumigation certificate before leaving farms. Moreover, we set 10 quarantine stations in 5 hotspot counties to disinfect trucks and trolleys that transport feed, eggs and poultry.
- Only three new cases have occurred in past two weeks, so we may be close to the end of this outbreak. In addition to continuing monitoring, farmers are urged to strengthen their biosecurity measures.

#### Thailand

- We are a small country, but we are one of the top four in the world in poultry production. The last case of H5N1 in Thailand was reported in 2008; we have not had a recent outbreak. Since the last outbreak, we have a better laboratory, more local staff, and we do a large amount of surveillance. Our control measures include increasing the biosecurity of the infected farm and the farms in a radius around it. We don't use vaccine, but are rely heavily on surveillance. We established eight categories of poultry facilities based on level of biosecurity for the purposes of surveillance (e.g. village chickens, backyards with and without basic biosecurity, commercial farms). By law, we compensate producers for destruction of infected birds at 75% of the market price.

#### Vietnam

- We have a sporadic outbreak every year since 2003. High poultry density in SE Asia is a risk factor for AI outbreaks. In Vietnam, free grazing of chickens and poultry is common, which increases the risk of AI transmission. Ducks are also one of the main at-risk commodities. In 2005, vaccination became one of the key control measures; we use vaccination as a control measure, not a preventive measure. We are young in developing a poultry industry; low biosecurity affects profit and loss. Yes, we do compensate producers affected by the disease, but we call it "financial support." We pay 70% to the family that is being affected by the disease.



#### Questions and Answers

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**Q For the Thailand delegate: Was the decision not to use vaccination made at a high level in the government?**

**A Thailand** delegate responded that the decision not to use vaccine was made in 2004 by the Prime Minister with a consultation from experts and OIE. The decision was made at the highest level. Our complicated surveillance program is currently at four layers and is getting even more complicated (backyard, village chickens, fighting cocks, etc. -- it is too detailed for discussion now).

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**Q For the Vietnam delegate, what roles do live bird markets play in AI outbreaks in your country?**

**A Vietnam** delegate responded that the highest risk facilities for AI transmission are duck farms; live bird markets are second most important. For socioeconomic reasons, we cannot simply close the markets.

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**Q What about the public awareness campaign (public education, outreach, social media, etc.) in your country?**

A **South Korea:** We provide HPAI awareness and biosecurity education and training for the industry and also provide various materials (posters, video, and handouts). We organize a symposium for the industry.

**Thailand:** We use stickers and other materials to provide contact information to report sick birds.

**Topic: Zoning for trade continuity during HPAI outbreaks**

- **Taiwan** uses and recognizes zoning.
- **Thailand** applied zoning by dividing regions into high-poultry density zones. 110 animal control stations (check posts) control the movement between these zones. The ideal would be to have a compartment in a free zone.
- **Vietnam** is not much interested in creating zones, but we do recognize zones in other countries. With an airborne disease, zoning may not be applicable.



**Presentation: Does LPAIV replicate in muscles of infected chickens?**

**Dr. Takehiko Saito, Japan National Institute of Animal Health**

A copy of the PowerPoint presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/tues\\_dr\\_saito\\_japan\\_presentation.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/tues_dr_saito_japan_presentation.pdf)

In the hemagglutinin protein of the AI virus, cleavage into HA1+HA2 subunit is crucial for infectivity. Amino acid sequence at the cleavage site determined the enzymes responsible for the cleavage. Tissue distribution of these enzymes differs and this determines tissue tropism of the influenza virus.

In theory, meat from LPAIV infected chickens could be contaminated with the virus. In literature are few examples of virus detection from muscles of LPAIV infected chickens and turkeys.

- Co-infection of *Staphylococcus aureus* or *Haemophilus paragallinarum* exacerbates H9N2 influenza A virus infection in chickens.
- From Kishida et al., Influenza A/chicken/aq-Y-55/01, A/chicken/aq-Y-135/01 isolated from the meat of imported carcasses was recovered from muscle samples of the experimentally infected chickens.

How often we could detect LPAIV in muscle by experimental infection? Does co-infection of *Mycoplasma* spp. enhance influenza virus replication in chickens?

**Conclusions:** Isolation of the infectious virus from muscle is a rare event in case of LPAIV infection, considering the amount of the virus infected in this study ( $10^6$ EID<sub>50</sub>). Risk of contamination of chicken meat by LPAIV is considerably lower compared to HPAIV infections.

## Presentation: Japanese experience in the Control of HPAI

Dr. Tatsumi Okura, Japan Ministry of Agriculture, Forestry and Fisheries

A copy of the PowerPoint presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/tue4\\_okura\\_japaneseexperience\\_in\\_the\\_control\\_of\\_hpai.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/tue4_okura_japaneseexperience_in_the_control_of_hpai.pdf)

Measures used in Japan against HPAI:

- **Prevention:** Impose strict biosecurity measures at farms.
- **Early response:** Monitor the disease situation through active and passive surveillance, and early detection and reporting.
- **Containment:** Cull of infected animals, disinfection, movement restrictions, and testing animals at farms around affected farms.



Tatsumi Okura

### Prevention measures:

Livestock owners in Japan should maintain these biosecurity standards:

- Keep animal health information records.
- Set biosecurity control areas.
- Prevent introduction of pathogens.
- Prevent wild animal-livestock contact; (e.g. install bird net).
- Maintain hygienic conditions.
- Check the health of the livestock daily.
- Secure burial sites or disposal facilities.

### Early response measures:

- Active surveillance in poultry consists of:
- Fixed-point monitoring is conducted year round. High-risk farms are selected. At least 10 samples from each farm are collected every month.
- Enhanced monitoring is conducted during bird migration season from October to May. Target farms are selected randomly at the level sufficient to detect 10% prevalence with at least 95% level of confidence. At least 10 samples are collected for antibody tests from each farm.
- Passive Surveillance in poultry: HPAI is a notifiable disease under the Act. Immediate notification of abnormal mortality rate (twice the average mortality) is mandatory.
- Wild bird surveillance includes bird habitat monitoring through fecal sampling from waterfowl and swab sampling from dead wild birds.

### Containment

- Control measures taken at affected farms consist of prompt culling within 24 hours in principle, burial or incineration of carcasses within 72 hours in principle, burial or incineration of contaminated materials, and cleaning and disinfection.
- Surveillance for HPAI freedom consists of on-the-spot inspections of all farms in movement restriction zones including clinical inspections, virus isolation, and serological tests. HPAI freedom may be regained when 10 days have passed since completion of all control measures at every farm in the movement restriction zones and negative results on clinical inspections, virus isolation, and serological tests.

- Compensation for rapid and effective control includes: the loss incurred by stamping out (100%); costs for incineration and burial of carcasses and contaminated goods (50%); sales reduction (50%) caused by movement restrictions. Livestock owners who violated the law by failing to take necessary preventive measures, or to promptly notify or cooperate to the control measures, receive reduced or no compensation.

Investigation at every affected farm found no direct man-made linkage between infected farms and other countries. There are many water places and wooded areas near affected farms. The genome sequence analysis showed that at least three lineages of H5N8 virus have been newly introduced into Japan since last fall. There is possibility that H5N8 viruses are widely circulating in wild migratory bird (e.g. wild duck) populations in breeding areas of the continent.

The most important elements for HPAI control are biosecurity and prevention of the outbreak, early detection, and notification, and rapid and appropriate initial responses.



### Question and Answer

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**Q Regarding surveillance and high-risk farms, how do you find high-risk farms and what exactly are you testing? Why do you consider broilers higher risk?**

**A** 10 samples for ELISA testing are collected at each target farm. Broilers may be at higher risk for infection because they are raised mostly in open air.

## Presentation: Use of the Canada/U.S. zoning arrangement during the 2015 HPAI outbreak

Dr. Abed Harchaoui, Canadian Food Inspection Agency

A copy of the PowerPoint presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/tue5-harchaoui\\_cfia\\_acianai\\_zoning\\_arrangement\\_canada\\_us.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/tue5-harchaoui_cfia_acianai_zoning_arrangement_canada_us.pdf)

Canada and the United States worked towards establishing a common framework for zoning for foreign animal diseases (FADs), to apply to both countries. The objective of the project is to ensure that Canada and the United States are protected against FADs and that, in the event of a disease outbreak in either country, bilateral trade can continue between zones that are free of the disease.

An FAD Zoning Recognition Initiative was desirable because of the highly integrated North American market for livestock, meat and meat products; a high volume of cross border trade; well-established business relationships and partnerships; the potential for major economic loss; and response to stakeholder interest.

The arrangement created between the U.S. Department of Agriculture (USDA) and the Canadian Food Inspection Agency (CFIA) outlines the intention of each country to recognize the other's zoning decisions in the event of a highly contagious FAD outbreak.

A USDA-CFIA bilateral working group developed a draft framework to guide implementation of the arrangement. The scope of the arrangement is limited to highly contagious foreign animal diseases of domestic livestock. It does not include endemic disease such as rabies or anthrax, and it does not include pets, wildlife or fish. The U.S. and Canada made the draft framework available for public comment. APHIS published a Federal Register Notice on May 13, 2014; CFIA published on the Agency's web site on June 11, 2014. Response to comments expected to be published by Fall 2015.

The framework includes an operational plan for zoning recognition, a structure for maintaining the arrangement, and a strategy to engage with stakeholders. The guiding principles of the framework are:

- Preparing for and limiting the negative impacts of a highly contagious FAD outbreak is a shared responsibility.
- Ongoing cooperation among all stakeholders is required.
- In-depth knowledge and trust in FAD management practices in each country is critical to the credibility of the arrangement and supports good decision-making.

The arrangement acknowledges USDA APHIS and CFIA as the authorities to establish zones and to recognize zones in other countries. USDA APHIS and CFIA are required to notify the other country of all confirmed detections of an FAD, establishment of control areas, release of control areas, and extenuating circumstances.

An APHIS-CFIA Steering Committee is responsible for the vision and maintenance of the arrangement. An APHIS-CFIA Working Group, in collaboration with stakeholders may lead special projects to help maintain the arrangement. Involvement of governmental and nongovernmental stakeholders in both countries is critical to the success of the arrangement. We consult with stakeholders on projects and priorities through various avenues, including established groups such as the Cross-Border Livestock Health Committee, US Animal Health Association, National Farmed Animal Health and Welfare Council.

### Work plan for 2015-2016:

- APHIS and CFIA intend to conduct a joint after-action assessment of the functioning of the Zoning Recognition Arrangement and Guidance Framework in response to recent avian influenza outbreaks in the United States and Canada, and make any updates to the Guidance Framework as necessary.



Abed Harchaoui

- Embed zoning recognition into currently available training and exercises.
- Prepare and publish a bilateral public summary of stakeholder feedback from the 2014 consultation process.
- Post updated Guidance Framework with updates from public consultation and post-avian influenza assessment.
- Work with disease and economic modeling experts (North American Virtual Animal Disease Modelling Center – NAVADMC) to develop targeted consequence assessments and other tools to further inform zoning decisions.

The Notifiable Avian Influenza Hazard Specific Plan guides the CFIA's investigation and disease control actions when NAI is detected, including: zoning and movement controls; surveillance and tracing; depopulation and disposal; cleaning and disinfection; and activation of the National Emergency Operations Centre (NEOC) in Ottawa and Area Emergency Operations Centres (AEOC).

The zoning arrangement was used for the first time by Canada in December 8, 2014. Canada recognized zones in U.S. during the outbreaks along the Pacific flyway from Dec 2014 to March 2015, and during the outbreaks along the Mississippi flyway from March 2015 to date. The U.S. had recognized the 2 AICZs in Ontario in April and May 2015. Canada is currently working on a new request from US. After-action assessments should be completed in peace time to discuss ways for improvement.



### Questions and answers

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**Q Does the market accept the meat that is labeled as coming from a restricted area? Is it reduced in price? Boxes are marked (not the resale packages). We would like to know if there is any chance the boxes can be exported.**

A The meat is from healthy flocks from the zone that had been tested negative to AI. The marked master boxes are for domestic sale only. The market has confidence in the practices of the CFIA and the industry. No reduction in price was noticed.

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**Q – How do you communicate about zone recognition so that movement can occur? Can product transit through states with these zones?**

A Once we receive the information we require, the process is very quick, and could take a day or two to process. As far as transit, generally it is a perception issue (i.e., eggs inside the truck are unlikely to contact virus by transiting a restricted area.)

Comment from Lisa Ferguson, APHIS: The agreement says that upon initial disclosure of an outbreak, movement is restricted until the outbreak is defined further and the zone identified. This is a good point of discussion. We have put this into play before we have finalized the framework on how to do this.

## Presentation: Official oversight of ostrich compartments

Dr. Julie-Anne Koch, South Africa Department of Agriculture, Forestry, and Fisheries



Julie-Anne Koch

A copy of the PowerPoint presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/tue6-koch\\_official\\_oversight\\_of\\_ostrich\\_compartments.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/tue6-koch_official_oversight_of_ostrich_compartments.pdf)

The Animal Diseases Act, 1984 (Act No 35 of 1984) requires registration of all land on which ostriches are kept, and movement of ostriches under permit. Disease control, testing, traceability, and biosecurity measures must be complied with in order for land to be registered. Veterinary Procedural Notice 04/2012/01 (revision 6.0)

establishes requirements for keeping ostriches; registration of compartments; official control, movement, additional requirements for EU exports; actions to be taken in case of outbreaks; and specific disease control and prevention measures for avian influenza. Official government inspection is required for registration as a compartment.

Provincial veterinary services (PVS) maintain an updated list of registered compartments per province. PVS audit, plan, execute, and provide resources for disease control surveys and the National Chemical Residue Control Programme. PVS also co-ordinate and manage disease control actions necessary, conduct audits on authorised vaccinators and perform annual audits at feed mills.

The Department of Agriculture, Forestry, and Fisheries (DAFF) provides:

- The most recent animal health and export requirements, regulations and policies
- Audits of the provinces regarding the controls described in the VPN
- National policy for disease surveillance and control
- Funding of outbreak controls in provinces for Controlled Diseases that are conducted in terms of DAFF policy and according to the directions of the DAH
- National co-ordination and direction in the case of outbreaks of Controlled Diseases
- Co-ordination and management of the National Chemical Residue Control Programme

Compartment flocks must test serologically negative within 21 days prior to movement to another compartment or an abattoir). A flock movement passport and flock registration number is required in order to move into a registered compartment. An official serological survey is conducted in compartment flocks once in every 6 month period

Requirements for geographic registered closed ratite holdings (for export of fresh ratite meat to the EU when the country cannot declare freedom from HPAI) include:

- Full VPN compliance for 3 months
- No NAI activity for the past 24 months
- Only day old chicks may be introduced from approved hatcheries
- Slaughter birds must be dispatched directly to the abattoir
- AI surveillance of ostriches and poultry within a 10 km radius
- Breeder birds must be tested at least once per year and must be seronegative
- Chicks must be tagged at less than 6 weeks old
- Farms must have shower-in and shower-out facilities
- Exclusion zones: 100m exclusion zone with no domestic pigs, wild pigs, or poultry; 3km radius exclusion zone with no other ostrich farms; 10km radius with no commercial poultry

The structure of the particular industry must be understood, but with co-operation of an industry, compartmentalization can work.



### Question and answer

**Q How long did it take to establish your compartment and what type of information did you need to share with your trading partners?**

A The E.U. is our main trading partner, which required detailed reports. We have been working on the compartmentalization project since 2002.

**Q Does the abattoir separately handle the slaughter of ostriches from compartments versus non-compartments?**

A Ostriches cannot be kept on land unless the land is registered and therefore a compartment.

## Presentation: European Union measures for the control of avian influenza

Dr. Francisco Reviriego-Gordejo, European Commission

A copy of the PowerPoint presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/tue9\\_reviriego\\_baltimore.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/tue9_reviriego_baltimore.pdf)

The main principles of avian influenza control legislation Directive 2005/94/EC are:

- Stamping-out policy of all poultry on infected farms
- Zoning 3km and 10km around outbreak farm
- Movement controls
- Cleaning and disinfection

Since 2007, the European Union has controlled low pathogenic avian influenza by stamping-out or very rarely, by controlled slaughter, to avoid virus circulation and possible mutation to HPAI.

Choice in control measures is based on risk assessment. More stringent measures might be used:

- A standstill might be applied to the whole territory for movements of poultry, poultry products, and vehicles of poultry sector. This may also be extended to mammalian species. A standstill cannot last more than 72hrs.
- A “temporary control zone” can be established around a holding under AI suspicion, relevant in densely populated poultry areas.
- Preemptive culling of flocks might be ordered upon suspicion of flocks in direct and indirect contact (vehicles, staff, and fomites) without awaiting sampling/diagnosis.

Some derogations from culling might be applied, such as quarantine and testing for endangered species or zoo birds.

Several tools are used by the E.U. for disease control:

- Member States establish contingency plans and conduct simulation exercises.
- The E.U. co-finances compensation for destruction of animals, cleaning and disinfection, and surveillance according to E.U.-guidelines.



Francisco Javier  
Reviriego Gordejo

- Emergency vaccination is possible under approved programs.
- Veterinary Emergency Team (CVET) missions may be sent to Member States and neighboring third countries with a disease or at risk.
- Better Training For Safer Food (BTSF)

A network of E.U. and national AI laboratories exists. The E.U. AI Reference Laboratory located in Weybridge, UK, arranges for:

- Annual meetings of all 28 Member States' national reference laboratories and other invited countries and experts
- Ring tests for virus typing, serology and PCR
- Confirmatory diagnosis and support to Member States
- Virus characterization, phylogeny
- Ongoing review of antigens for ability to detect new strains to rapidly update of antigens for surveillance

Biosecurity is the first line of defense against AI virus introduction in poultry flocks. However, solid scientific evidence about the real efficacy of these measures is often lacking or is not quantified. Compulsory confinement does not seem to be the sole answer, as HPAI H5N8 has been detected mainly in indoor farms.

The objective for AI surveillance in E.U. poultry is to detect circulating AI virus. The scope of surveillance includes LPAI in chickens, turkeys, guinea fowl, pheasants, partridges, quails and ratites; and LPAI and HPAI in domestic waterfowl: ducks, geese, and mallards for re-stocking game. The strategy targets surveillance based on risk factors including proximity to wet areas where migratory wild water birds gather, poultry on free range, poultry holdings with more than one poultry species, areas with high density of poultry holdings, and areas of high intensity of trade.

The objective for surveillance in wild birds is timely detection of HPAI H5N1 to protect poultry holdings. The scope is “target species”, which are a selection of 50 bird species having shown to become infected with HPAI H5N1, such as migratory aquatic birds and those previously found infected (e.g. birds of prey). The strategy is risk-based surveillance through laboratory testing of moribund or birds found dead, focusing on water birds, and increased surveillance close to areas with a high density of poultry holdings.

Emergency or preventive AI vaccination is primarily a Member States' decision. The Commission needs to approve the vaccination plan, which must be coupled with stringent surveillance and control of movements of vaccinated flocks. Member States do not presently see advantages in using emergency vaccination with currently available vaccines, since the onset of immunity is too slow, application is cumbersome and costly, and trade implications are likely to be significant. Although vaccination is an internationally recognized measure, currently very little use of preventive vaccination occurs in the E.U. in poultry and zoo birds.

European Food Safety Authority (EFSA) assists science-based animal health legislation through assessments, such as:

- Modes of virus entry into E.U. poultry farms for review of biosecurity measures and surveillance tools (2015)
- HPAI H5N8 epidemiological situation and spread (2014)
- Animal health and welfare aspects of AI and risk for introduction into EU poultry (2008)
- Vaccination against AI in domestic, captive and zoo birds (2007)
- Animal health and welfare risks associated with import of birds other than poultry (wild caught) into the EU (2006)
- Possible role of migratory birds in HPAI spread (2006)

- Animal health and welfare aspects of AI (2005)

These are available at <http://www.efsa.europa.eu>

Some conclusions on avian influenza:

- The response to AI outbreaks in Member States works well.
- Robust emergency procedures and contingency plans are in place.
- AI disease control measures are generally well accepted.
- A good balance exists between prescription and flexibility for Member States.
- Measures are in line with OIE requirements
- No major shift in rules is foreseen in the most recently reviewed veterinary legislation
- Fine-tuning of existing measures will be based on scientific advice
- Vigilance has to be kept high, as variety of strains has created a complex situation



### Question and Answer

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**Q Regarding E.U. compensation and surveillance, how do you make it fair for all members?**

**A** Flexibility can be put in place in a structure like the EU. One way of spending a tiny part of the budget is to forget other concerns and redistribute the money.



## Tuesday Summary

Dr. Brian McCluskey, USDA APHIS

Themes for the day are:

- Vaccination (mentioned 26 times);
- Biosecurity (mentioned 15 times);
- Zoning mentioned 15 times);
- Compartmentalization or compartments (mentioned 10 times).

Lots of great information was presented today because of the diversity of the countries and their approaches. We also heard about many accomplishments and compliments. Dr. Cardona asked us to consider whether what we are doing to control and prevent AI is working. There really isn't one answer and we heard that today. We once believed your neighbor is your greatest risk, now it might be right inside your barn.

Other points from the day's discussions:

- We need to start to remove some barriers around surveillance.
- We heard that "International trade is an undeclared war and disease outbreaks are the weapons of choice."
- Emergency management 101: 3 elements we must address are 1) biological, 2) communication and, 3) relationships.
- Panelists showed that control measures really have been successful.
- Almost all countries offered some kind of compensation for affected flocks
- The whole concept of epidemiology is to identify risk factors, and risk factors are something we have some influence and have some control over.
- Migratory birds, free range ducks, live bird markets are common challenges. Many organizations are trying to educate the people between and in the markets.
- Emphasize biosecurity; we must influence and monitor industry's biosecurity practices. It is frustrating and difficult to prove the effectiveness of biosecurity measures; the way to do it is to monitor and audit. You can have the greatest biosecurity plan, but if it is not being followed, it will not work.



**Wednesday, June 24, 2015**

**Presentation: Control and prevention of HPAI in the Netherlands**

**Dr. Christianne Bruschke, Chief Veterinary Officer of the Netherlands**



Christianne Bruschke

Netherlands is one of the most densely populated countries of the world. About 10% of our industry is poultry. Poultry trade with the U.S. is mainly in hatching eggs and egg powder.

A major HPAI outbreak occurred in 2003, when HPAI H7N7 infected 241 holdings. 30 million poultry were culled at a cost of € 270 million to control disease and € 500 million due to trade disruptions. Between 2010- 2015, the Netherlands dealt with several LPAI outbreaks. In 2014, an HPAI H5N8 outbreak occurred.

AI surveillance in the Netherlands consists of:

- Syndromic surveillance: Producers monitor flocks for clinical signs for AI and report if mortality is greater than 0.5% daily during 2 succeeding days
- Passive surveillance: Veterinarians perform AI diagnostics on sick birds to exclude AI as a cause
- Active surveillance: Serological monitoring program

The Netherlands controls AI by:

- Placing a 1 or 3 km restriction zone
- Culling of poultry on the infected holding
- Cleansing and disinfection
- Tracing of animals and products recently transported from the infected holding
- Epidemiological investigations/ screening
- Communication to the private sector, E.U., OIE and trading partners.
- Apply standstill in the entire country (no transport of animals, by-products, feed, or vehicles etc.)
- No visitors allowed on poultry holdings
- All commercial poultry confined indoors;

A “standstill” is used to 'freeze' the situation in the whole country in order to perform epidemiological investigations and implement all necessary measures including restriction zones. During a standstill, we implement a 3 km protection zone, a 10 km surveillance zone, and a buffer zone (sometimes called the infected region). Contact holdings and holdings in the surveillance zone are screened. Birds within the 1 km zone and birds on dangerous contact holdings may be pre-emptively culled. After the standstill, regionalisation is applied, and restrictions in free regions are reduced.

The direct costs of the 2014 outbreak were compensation for 8 culled farms at a cost of €1,000,000 compensation for hatcheries and chicken breeders for €6,500,000, and eradication costs of € 1,500,000. Costs are paid by the Animal Health Fund which is funded by both the private sector and state. Maximum contribution from European Union is 50% of eligible costs.

Estimated direct trade losses by sectors:

- Hatcheries and chicken breeders: €36,000,000
- Poultry meat: 10's of millions
- Meat products: € 2,000,000

- Manure: €1,200,000

After the outbreak, reopening trade with the E.U. market was based on E.U.-legislation. Reopening trade with third countries was, in principle, based on OIE standards, and regionalisation was applied by some countries. The Netherlands updated trading partners regularly through OIE reports, answering questionnaires from trading partners, and conducting trade missions and bilateral meetings.

Critical performance indicators of the AI response include:

- Continuous monitoring
- Awareness in the private sector
- Strict biosecurity measures
- Good contingency plans including contracts with all necessary partners
- Tailor made communications to re-establish trust

The 2014 outbreak in the Netherlands was limited to 5 outbreaks due to application of very strict measures. A 237 million euro trade is at stake. Good cooperation with private sector and good media attention are necessary for success.



## Questions and Answers

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### **Q How did you dispose of the poultry and depopulate 100,000 birds in hours?**

A The carcasses go to rendering. We have contracts with culling companies that use CO<sub>2</sub> to gas the whole house. I will look for a film to show how they do it. In all outbreaks in last few years, it is all done the same day.

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### **Q What is the largest facility?**

A 180,000 birds (average) over 6 stables in 3 houses. These are not caged layers.

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### **Q How long was the Amsterdam airport shut down during last outbreak containment?**

A The standstill lasted 3 days only, and no transport of poultry or poultry products from the airport was allowed. We made a corridor from the region to the airport for movement of poultry.

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### **Q During epi investigation, could you determine the most possible means of spread between farms?**

A We think spread was only between two farms; we think a duck farm infected another farm. We think the other introductions were from the wild birds.

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### **Q How do you communicate the 72-hour standstill?**

A We do this through an umbrella organization put it in place officially. A press release is enough; in a small country, it is all over the news. We use private sector organizations to communicate. A complete standstill is much easier than permitting because nothing is allowed.

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### **Q If a holding is PCR positive and serological negative, do you wait to depopulate?**

A No, everything is depopulated. The final decision is if we detect an active infection, then we depopulate (especially if it is serological negative) and then screen surrounding area.



## Panel Discussion: Europe

**Moderator: Dr. John Glisson, U.S. Poultry and Egg Association**

Panelists are from European countries that have experienced recent outbreaks of HPAI.

- Dr. Francisco Reviriego-Gordejo: Head of Disease Control and Identification, Directorate General for Health and Food Safety, European Commission
- Dr. Jörn Martin Gethmann: Senior Scientist, National Institute of Animal Health of Germany
- Dr. Christianne Brusckhe: Chief Veterinary Officer, Netherlands
- Dr. Simon Hall: Veterinary Director, Animal Health and Veterinary Laboratories Agency, United Kingdom

### Topic: Country HPAI Situation Report

#### Germany:

We have about 180 million animals and 60,000 farms. In 2014, we had our first outbreak on a turkey farm with 31,000 animals. All of the animals were culled and no free range was allowed. In December, we found another infected turkey farm (20,000 animals), and 3 days later, we detected an outbreak in commercial duck farm experiencing high mortality. In January, we had another detection; nearly 500 captive birds, so we used different control measures. Two more outbreaks were found in commercial farms a few days later; all animals were killed, facilities were disinfected, and no animals were allowed to leave the farm.

Our AI control measures include clinical inspections and investigations; contact farms must be tested. Vaccination is forbidden in Germany, but there are exceptions. Infected facilities must be secured, and no one can enter the farm. To restock a previously infected farm, the facility must have biosecurity processes in place, regular oversight by veterinarians, and AI testing.

#### Netherlands:

Vaccination is not allowed in the Netherlands and we don't think it is effective. It takes too long to protect and the virus would spread anyway. We have a small country and everyone does the same thing. Once it is in the contingency plan that is what is done. We meet with private sector organizations every morning to decide and explain what will be done, and why we are going to do it. We are able to communicate very quickly and intently with everyone involved.

#### European Union:

Contingency plans are very important to have in place. The European Commission (EC) needs to supervise and ensure the system works, base our policy on best practices, and promote sharing information. 90% of the work is done by the Member States. The EC gathers information and asks questions – sometimes difficult questions; we access information and dispatch information. Another layer of sharing information is by communicating through an official manner; the EC reacts immediately and Member States are bound by legislation. This is intended to help countries and our trading partners to understand what is going on.

Vaccination is allowed in the E.U. provided that this is approved by the EC; we have a vaccination program that is comprehensive and covers all possible risks. If the Member States do not see an advantage of these vaccination plans then there is no reason for us to approve.

**United Kingdom:**

In the most recent U.K. AI outbreak, the index farm experienced severe egg drop and increase in mortality while there was some bacterial disease going around. The whole industry was on high alert for AI. The farm veterinarian did well reporting problem.

A very detailed epi investigation was conducted to determine the source of infection. The first part of investigation was virology and we were able to seek answers very quickly. Wild bird transmission was suspected as the source of infection, but we have very dry country and very few lakes and rivers, and looked at other possible routes of introductions. We concluded that the most likely source was indirect contact with a wild bird, but maybe human contact, too. We hypothesized that we missed an infected farm, and when we looked at possible sources of spread, we generated 250 tracings and investigated 150 farms. Contact with a hatchery was uncertain, so eggs were destroyed, but our initial investigations suggested our hatchery was not infected.

Our consumers, led by the newspapers, are very aware of avian influenza, so it was good that we were very quickly able to assure consumers that there was not risk to public health. E.U. trade was basically fine. Control measures consisted basically of stamping out and vaccination, but there is no great use of it. For compensation, we pay 100%.



**Questions and Answers**

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**Q How many days do you wait before restocking?**

A During the outbreak, we did not allow any restocking. Then after three rounds of testing after 3 weeks, if they are negative, then they can restock.

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**Q Regarding airborne spread, have you seen anything recently to suggest that airborne spread may be a cause?**

A We did an analysis on this. You can have air born spread, but because farms are so close to each other it is difficult to say what is the method of spread.

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**Q What can we expect to happen to trade if vaccination is permitted in the U.S.?**

A European Commission delegate responded that vaccination will be acceptable if the U.S. follows the protocol that we are using, but the program we are using is so restrictive that it may be difficult.

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**Q Do backyard flocks in the EU play significant epidemiological role in AI outbreaks?**

A We had infected backyard facilities. There is a certain risk to industrial farms. Backyard flock infections are not very involved in the AI epi investigation; there is no indication they are a major concern in the outbreak.

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**Q For the U.K. delegate, you said that 100% compensation is paid. Please explain?**

A We do not pay consequential losses. It is very clear what the value of poultry is in the UK. We pay for healthy birds; if bird dies, we do not pay.

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**Q The U.S. vaccinates for AI, will the E.U. accept egg power and processed egg products from the U.S.?**

A The E.C. delegate responded, "Let us see your vaccination program and get something solid to discuss."

**Q What type of culling do you use?**

A Germany uses containment culling (large steel containers) as one culling method

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**Q What do you do with the rendered product?**

A AI virus is killed by heat in the rendering process. The rendered material has a variety of uses, although it cannot be used for animal feed in the E.U.





## Panel Discussion: North America

**Moderator: Dr. Gregorio Rosales, Aviagen**

Panelists are from North American countries that have experienced recent outbreaks of HPAI.

- Dr. Harpreet Kochhar: Chief Veterinary Officer, Canada
- Dr. Igor Romero Sosa : Director, Mexico-United States Commission for the Prevention of Foot and Mouth Disease and Other Exotic Animal Diseases, Mexico
- Dr. John Clifford: Chief Veterinary Officer, United States

### Topic: Country HPAI Situation Report

#### Canada:

We experienced two outbreaks in 2014 and 2015. We have a very strong laboratory that allows us to do preliminary action very early. The case was investigated on December 5, and by December 8, we had established primary zone. We used in-farm gassing for depopulation. We prefer to dispose of birds through in-farm composting, so it contains the virus. Then cleaning and disinfection happens, followed by three months of intense surveillance. By June 6, we were free from AI. As soon as we deployed our emergency teams, we have very tight relationships with industry, labs, and academia, which allow us to build together a network to exchange information very rapidly. We did lose some international markets.

#### Mexico:

This is a very important topic and requires prompt attention being that we are talking about food based on poultry products. Mexico has lived with the challenge of H5N2 LPAI, but in June 2012, there was a report of a new problem caused by H7N3 HPAI in a highly localized area in the state of Jalisco. We established quarantine as soon as we found out about it. We have worked improving the laboratory network to develop a quick response based on diagnosis services. I emphasize that quick diagnosis is a priority in order to have an appropriate response. It is important to have a safe diagnosis and immediately activate a response plan. In Mexico, producers must follow the legal framework.

55% of the table egg of the country is produced in the most affected region. The outbreak in this region generated at the time a negative economic impact on consumers and the nation. In our experience, the virus came from migratory birds and many facilities in this country did not have the option to prevent this contact; with these extreme circumstances, the decision was to use vaccination locally. We were fortunate to have a strain that was suitable, according to the scientists, as a vaccine appropriate for use. Soon after the vaccine was released, we administered it to 10 million birds. The vaccination program worked and 140 days elapsed without reports of new cases.

Later there was an additional outbreak in the region where the vaccine was used, leading to 22 million dead or culled birds. This was very big endeavor and we have full cooperation of producers. Control measures were very intense and involved removal and disposal of the manure, cleaning and disinfection and a 120 day period to

make sure they were free of infection. We implemented a strategy that includes quarantine, surveillance, mobilization control of poultry and its product including manure and official communication of information to the public- a way to ensure the information was genuine and based on facts. We implemented surveillance in commercial, backyard and wild birds with the support of governments departments and auxiliary bodies.

#### **United States:**

The 2014-2015 AI outbreak is the most critical outbreak we have ever experienced, and it will cost almost \$600 million to control. Biosecurity has been critical. We have to consider the entire environment in some of these locations where wild waterfowl are highly populated throughout the year.

For compensation, we pay fair market value of the birds at the time of death. We pay 100% of cleaning and disinfection costs. The outbreak is devastating to a lot of people in many states and families. People are out of work. We must keep the human element in mind; it is not all just about money.



### **Questions and Answers**

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#### **Q For the Mexico delegate: Do you compensate for losses?**

A The Mexico delegate responded that producers whose flocks were depopulated were compensated. Mexico is working to develop a support system of health contingencies.

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#### **Q Has there been any domestic consumer negative reaction?**

A **Mexico:** No adverse reaction from consumers. **Canada:** Negligible to minimum reaction from consumers. **United States:** No concern or reaction; however, there has been price increase and lack of product availability

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#### **Q - How do we prepare better for the educational side for the future?**

A - **United States:** We are planning for a worst-case scenario next year in the fall, looking at major outbreaks in every poultry producing state in the US. We are working on obtaining more funding and having additional personnel trained and ready to go. We will have vaccines stockpiled and ready to use. We will have a strategy; like Canada, we have a stamping out policy. We are beginning with sessions next week to prepare for the future and develop a comprehensive plan that we will share with everyone. We need to collectively find ways to solve this world problem, and we need to move product around the world. We need to take a hard look at our regulations and requirements for trade, and develop a new world, where we are not putting up barriers, but finding ways to trade and expand across the globe.

**Canada:** Biosecurity, surveillance, and an integrated network are the three key components to success.

**Mexico** agrees with the challenges highlighted by the United States and Canada. We need to diminish the impact on the producers. It is very important that we all realize that these events are making us work better together and the producers are cooperating being part of the solution. There is also a better working relationship with our counterparts from Canada and the United States of America and we hope that this is established in a memorandum of cooperation to have a better communication and cooperation among countries improving the sharing of information.

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#### **Q Is the U.S. ready to dig into deep pockets and spend money to eradicate AI?**

A The **United States** delegate responded, "Where is the silver bullet? We need to put more thought in how we deal with this disease. Is it necessary to kill 50 million birds?" Perhaps we should use selective breeding to have birds with better immunity, even at the cost of some productivity. Primary breeders are looking at research to improve immunity in birds.

The **United States** delegate commented about the one-health concept. We do not give enough resources to animal health, even though AI could be the next pandemic. Animal health and public health need to come together as group and understand each other.

The **Canada** delegate agreed that we have strayed away from the one-health connection. Need to look at the issue from the angle that a reassortment could result in a virus that transfers to humans.

The **Mexico** delegate concurred with the other panelists. Mexican animal health authorities have been working closely with the Department of Human Health.

The **United State** delegate commented that the U.S. intends to change our rules that are barriers to trade with countries that practice AI vaccination.

**David Swayne** commented that vaccination historically has been used effectively as a tool in an AI eradication program. Surveillance was used along with vaccination. Failures have been talked about and not the successes. Although comprehensive nationwide vaccination hasn't been successful, targeted vaccination programs have been successful.

The **United States** delegate commented that vaccine should be in the AI tool box, to be used in high risk areas and used strategically and for a limited time with eradication as the goal.

## Presentation: Biosecurity for live poultry in transit

Dr. Alberto Torres, U.S. Poultry and Egg Association



Alberto Torres

A copy of the PowerPoint presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/wed2\\_torres\\_ai\\_trade\\_air\\_cargo\\_biosecurity\\_atr.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/wed2_torres_ai_trade_air_cargo_biosecurity_atr.pdf)

The U.S. Poultry & Egg Association is the world's largest poultry organization. Membership includes producers and processors of broilers, turkeys, ducks, eggs, and breeding stock, as well as allied companies. We have member companies worldwide and 27 affiliated state associations.

Several breeder companies joined together to form the USPOULTRY Air Cargo Committee to find ways to reduce the losses. They developed what became the Air Cargo Seminar to convey to the airlines proper handling techniques and environmental conditions necessary to protect their perishable, but valuable products. Positive results were soon realized, and losses declined. Today, Air Cargo Seminars continue to be presented to airlines periodically in Miami, New York, Atlanta, Dallas, Chicago, and Washington DC.

Primary Breeder/Air Cargo Committee Member Companies include Aviagen, Aviagen Turkeys, Centurion Poultry, Inc., Cobb-Vantress, Inc., CWT Farms, Inc., Hubbard Breeders LLC, Hy-Line International, Keith Smith Company, Inc., Morris Hatchery, Valley Of The Moon Commercial Poults.

The primary poultry breeders are a handful of companies; just a few companies raise the breeding stock for 95% of world chicken meat production, 80% of world turkey production, and 80% of world egg production. Primary poultry breeders apply the highest biosecurity standards in the poultry industry. In more than 3 decades of exporting breeding stock globally, hatching eggs and day-old chicks have never been implicated in the spread of AI – either LPAI or HPAI. The risk of AI spread through day-old chicks and hatching eggs is negligible.

Shipping policies of primary poultry breeders include:

- No co-mingling of birds from different companies on flights.
- Excellent communication with shippers and receivers.
- Direct flights are used when possible and available. If connections must occur, a few major airline hubs are used (e.g. Amsterdam, Frankfurt, or Hong Kong) where temperature controlled animal facilities might be available and can segregate shipments from contact with other poultry or poultry products. Freight forwarding agents use Standard Operating Procedures and have temperature controlled handling facilities

Transportation conditions for day-old chicks and hatching eggs are planned to ensure wellbeing and avoid contact with other birds. Transit through international airports of countries affected by HPAI *should* be allowed. Ground transit through affected areas should be considered when situations are under control

## Presentation: Overview of Avian Influenza Surveillance in the United States

Dr. T.J. Myers, USDA APHIS

A copy of the presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/wed3\\_myers\\_ai\\_surveillance\\_overview.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/wed3_myers_ai_surveillance_overview.pdf)

U.S. AI surveillance programs include active surveillance through the National Poultry Improvement Plan (NPIP) and Live bird marketing system (LBMS), passive surveillance through disease reporting and foreign animal disease investigations, and wild bird surveillance.

The objective of the National Poultry Improvement Plan is to provide a cooperative Industry-State Federal program through which new diagnostic technology can be effectively applied to the improvement of poultry and poultry products throughout the country. NPIP operates through a memorandum of understanding with each State, and is governed by the General Conference Committee, an official advisory committee to the Secretary. NPIP rules are codified by regulations and standards developed jointly by industry, State, and Federal officials.

NPIP Participants include poultry breeders, commercial production poultry, and nontraditional poultry species. Participants are responsible for following program guidelines, including biosecurity.

NPIP diseases of concern are salmonellosis, mycoplasmosis, and avian influenza. 97 laboratories are authorized to conduct NPIP testing.

**Official Tests for AI:**

- Qualifying tests:
- Antibody detection
- ELISA (enzyme linked immunosorbent assay)
- AGID (agar gel immunodiffusion)
- For suspect flocks:
- Agent detection; RRT-PCR (Real-time reverse transcriptase PCR)
- USDA licensed influenza A ACIA (antigen capture immunoassay)
- Virus isolation

The NPIP AI Clean Program applies to egg-type and meat-type primary or multiplier breeding chickens. To qualify, the flock must have negative serology at 4 months of age and prior to onset of egg production. To remain in the program, flocks must be tested every 90 days and within 21 days of slaughter. A similar program exists for ratiities (ostrich, Rhea, emu, or cassowary).

The NPIP H5/H7 Clean Program applies to turkey and meat-type waterfowl breeders. To qualify, the flock must have negative serology at 4 months and prior to onset of egg production. To retain Clean status, the flock must have negative serology every 90 days. A similar program exists for exhibition, game fowl, and backyard poultry breeders.

The H5/H7 Monitored Program is available for commercial layers, broilers, turkeys, and upland game birds. To qualify, a commercial layer flock must have negative serology within 30 days prior to movement or during ongoing surveillance approved by APHIS and the official state agency (OSA). Negative serology is required 30 days prior to disposal and within 12 months or during ongoing surveillance approved by APHIS and OSA. Broilers must test negative during each shift at the slaughter plant, or no more than 21 days prior to slaughter, or during ongoing surveillance approved by APHIS and OSA). Turkeys must have negative serology within 21 days prior to slaughter or during ongoing surveillance approved by APHIS and OSA.

APHIS pays 100% of eligible costs related to infected or exposed commercial or breeding poultry from participating flocks in States that:

- Participate in an APHIS-approved surveillance program
- Conduct active surveillance for H5/H7 LPAI
- Have an APHIS-approved ISRCP
- Nonparticipating commercial and breeder flocks are eligible for only 25% of costs
- LBMS and small flocks eligible for 100% if State meets above criteria (size of flocks is defined in the regulations)

State should establish or consider the following for their response and control plans:

- Disease management committee
- Biosecurity plan
- Provisions for adequate diagnostic resources
- Procedure for initial investigations of suspect H5/H7 LPAI
- Procedure for reporting test results
- Quarantine measures
- Flock plans for infected/exposed flocks
- Disposal plans
- Cleaning and disinfection and repopulation plans
- Monitoring zones, restricted movements
- Monitoring activities within control zones
- Vaccination option, if approved by APHIS
- Controlled marketing options
- Public awareness and education

The Live Bird Marketing System covers retail live bird markets and their production and distribution systems; the system is a voluntary Federal-State-industry program. Program standards provide guidance for LBMs, including an active and passive AI surveillance program that protects LBMs and reduces risk to commercial poultry.

The goal of future wild bird surveillance is a flexible surveillance framework that can monitor wild waterfowl populations for the distribution, spread and genetic makeup of HPAI viruses. Passive surveillance in sick and dead birds is conducted year round in all species. Active surveillance of apparently healthy birds targets dabbling ducks during post-nesting season (summer) and fall/winter migration. Environmental fecal sampling is also conducted at targeted locations throughout the year.

The Biosecurity for the Birds Campaign is aimed at backyard flock and pet bird owners. The campaign reaches a diverse audience through print materials, website, radio, and local cooperatives, and it stresses bird care and biosecurity, teaching bird owners to “Look for signs; Report sick birds; Protect your birds.”



### Questions and Answers

Comment from Denise Brinson, APHIS: NPIP is a cooperative program. We will be celebrating the 80<sup>th</sup> anniversary of the plan. We have 49 States that participate. Hawaii is also becoming a participant as well as Puerto Rico.

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**Q What types of animals do you sample at live bird markets?**

**A** We do surveillance at the production, retail, and distribution ends.

## Presentation: Trade consequences of the Yorkshire HPAI outbreak

Dr. Simon Hall, UK APHA

A copy of the PowerPoint presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/wed4\\_hall\\_usda\\_flu\\_conference\\_uk.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/wed4_hall_usda_flu_conference_uk.pdf)

**Case History:** H5N8 HPAI was confirmed 16 November 2014 in a duck breeding flock, part of integrated breeding and growing operation with 43 associated flocks. The most likely source was indirect contact with wild birds. Exhaustive investigations did not identify any other infected flocks.

Compartments are defined by the OIE. “compartmentalisation is a procedure that may be implemented by a country to define and manage animal subpopulations of distinct health status within its territory, in accordance with the recommendations in the terrestrial code for the purpose of disease control and/or international trade.” EU Directive 2005/94 defines ‘poultry compartment’ or ‘other captive birds compartment’ as a holding or holdings under a common biosecurity management system containing a poultry or other captive birds sub-population with a distinct health status with respect to avian influenza subjected to appropriate surveillance, control and biosecurity measures. COMMISSION REGULATION (EC) No 16/2009 of 13 July 2009 implemented Council Directive 2005/94/EC as regards the approval of poultry compartments and other captive birds compartments with respect to avian influenza and additional preventive biosecurity measures in such compartments. The U.K. established the Poultry Compartments Order 2010 and the Poultry Compartments (Fees) Order.

The U.K. poultry industry was highly motivated to compartmentalize due to the economic impact of outbreaks from 2006 to 2008. Poultry breeding companies began discussions 2008, and scheme details were finalized in 2009. The first premises was approved in 2010. One primary breeder is approved, but another is well advanced, and there is wider interest.

Essential components for managing the compartment:

- Rules: Importing Third Countries provide the detail that they will need to accept product from the compartment
- Inspectorate: independent of the industry, with a reputation that can be trusted
- State authority: the compartment is supervised and audited by official authorities in order to obtain recognition by Authorities in other States

The compartment manager must write company protocols, which comply with the Schedules. The company must write management protocols ‘in partnership with the veterinary authority’. The company needs guidance from the authority about what the protocols must contain. Schedules provide companies with guidance about the minimum requirements.

The biosecure zone principle is paramount and is defined as the parts of the premises where people can go only after the full body shower and change of clothing. Vehicles may not enter unless they have undergone decontamination of wheels and wheel arches. Everything that enters the biosecure zone must be under control of company management.

Zones and compartments both refer to animal sub-populations, which are effectively isolated from the populations in the country as a whole. In a zone, the sub-population is isolated by geographical features and official control measures. In a compartment, the sub-population is isolated by management and husbandry practices. Refer to OIE Terrestrial Code articles 4.3.1. and 5.3.7.

Potential benefits of compartments:

- Reinforces general biosecurity for the company



Simon Hall

- Potential to export if a country loses free status and regionalization won't work
- If agreements are in place and disease is localized then the compartment should be able to resume exports within one incubation period

Risks of compartmentalization:

- A significant investment by industry is required, with uncertain payback.
- Importing countries want to see the system working before considering acceptance.
- For a well-controlled outbreak, U.K. compartmentalization provided minimal benefits for EU trade.

Actual benefits for the Yorkshire case:

- UK recovered OIE free status for HPAI 15 May 2015
- Minimal impact beyond the 10km SZ on EU trade
- One non-EU country accepted a consignment of breeding poultry from a compartment in January 2015.



## Session to collect summary conclusions and recommendations from the group

**Moderator: Dr. Rick Hill, USDA APHIS**

A copy of the PowerPoint presentation is available at

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/downloads/mtg/presentations/international\\_ai\\_conference\\_conclusions.pdf](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/downloads/mtg/presentations/international_ai_conference_conclusions.pdf)

## Conclusions

In order to facilitate discussion and debate during the final “recommendations” session, meeting organizers outlined the following key issues and themes that were raised by speakers, panelists, or meeting participants throughout the International Conference.

### **Key Issues and themes that emerged during the conference:**

- International Standards
- Acceptance of a zone or compartment
- Biosecurity
- Vaccination
- Risk-based mitigations for commodity trade and transit
- Surveillance and control Strategies
- Wild birds

Many countries worldwide are experiencing an unprecedented HPAI event that is threatening animal health and welfare, agriculture productivity, food security, farming community livelihood, economics, and global trade. The current situation is described as an ongoing series of worldwide transboundary disease events with rapid spread with global implications. Spread continues and new viruses continue to emerge as a result of complex interactions of host, agent, and environment. Wild bird reservoirs complicate prevention and control, as well as trade decisions.

Worldwide, this HPAI event is unique, requiring reassessment of prevention, control, and eradication strategies. There is no one answer to prevention and control. Stamping-out remains the best response and has been largely successful.

- Animal health and veterinary medical sectors have a unique and critical role in monitoring and response.
- All countries and stakeholders have a role and obligation with disease detection, reporting, and transparency.

- Response to an animal health situation in addition to facilitating safe trade is critical to global food security.

**□ Regarding international standards:**

- WTO and 1995 SPS Agreement provided legal weight to the long-established science-based OIE Standards.
- The standard setting process was developed by experts from across the globe, including experts from Reference and Collaborating Centers, Member countries, and international organizations.
- These standards evolve and are revised in response to contemporary issues. It is essential to use science and integrated risk-management to make decisions to continue safe trade.
- The standards recognize zoning, compartmentalization, and commodity-specific risk, which are universally adopted by Member countries. OIE Member countries have an obligation to adhere to, and follow standards and guidelines.
- Continued circulation of these AI viruses and the recent upsurge in outbreaks worldwide reaffirms the need for better implementation of the intergovernmental standards adopted by the OIE's 180 Member countries.
- Conference attendees recognize that implementation, interpretation, and consensus among Member countries are not universal.

**□ The responsibilities and roles of the private sector are:**

- Collaborative communication with animal health and public sectors, including producer education and industry partnerships.
- Public awareness and engagement during "peacetime" and during incidents/events.
- Preparedness and contingency plans (e.g. Secure Egg Supply) and activities allow for safe movement in the face of an outbreak.
- Early disease detection with prompt, mandatory reporting to the National Veterinary Authority.
- Independent evaluation/validation of biosecurity protocols.
- Preventative plan that incorporates occupational health, safety and the environment (including zoonotic considerations with potential human pathogens) and simulation exercises.
- Contribute to international standard setting.
- Participate in regional associations, which are important for controlling transboundary diseases.
- Support research into genomics, immunity, vaccines, and diagnostics.
- These activities require investment and commitment.

**□ The responsibilities and roles are of the public sector are similar to the private sector', plus:**

- Effective legislation necessary to undertake surveillance and control; zone or compartment control, etc.
- Compensation for depopulation supports surveillance and control programs.
- Promote international commerce, negotiate trade agreements, and provide oversight for certification programs.
- Establish zoning or compartmentalization arrangements during "peacetime."

**□ Collaboration between private and public sectors:**

- Public-private partnership is essential during "peacetime" and during incidents.

- Sharing expertise, collaboration, and lessons learned from outbreaks are critical.
- Each major event is an educational moment, and new information, such as epidemiological findings, can inform preparedness and response/control strategies.
- Working together, reciprocity, and building trust are crucial to trade negotiations and safe import and export of poultry and poultry products. Bilateral or regional agreements are examples of successful collaborations.
- Success depends on science, communication, and relationships.
- Conference attendees universally recognized the significant socio-economic impacts of this disease.
- We share common goals – animal health and global food security – therefore, there is a need for a coordinated global health strategy for AI.

**□ Regarding biosecurity:**

- Along with zoning, biosecurity is the second most frequently mentioned issue during the conference. Biosecurity is the top priority and the first line of defense to prevent introduction of AI virus into flocks.
- Consider the role of shared equipment, fomites, vehicles, and other human activities, and look beyond the premises or the next-door neighbor for potential sources of virus.
- Audit and test biosecurity plans, and continuously re-evaluate processes.
- Animal health management practices, such as mixed species farms, live bird markets, free-range birds, high-density commercial poultry, and backyard flocks, present challenges to traditional control methods and strategies.
- Biosecurity needs to be reassessed at the global level.
- Conference attendees discussed and questioned the appropriate level of government oversight for compliance with biosecurity standards.

**□ Regarding surveillance:**

- Surveillance objectives include early detection of mutations; gathering information to better understand epidemiology, risk factors, transmissibility and pathogenicity; and monitoring that will lead to improved diagnostics.
- Comprehensive surveillance (syndromic, passive, serologic, risk-based) is needed for rapid containment and control, acquisition of genetic information for diagnostics and biological response, so that vaccines are better matched to field strains and differentiating infected animals from vaccinated animals (DIVA) is possible.
- Compensation for depopulation supports surveillance in most countries.
- Surveillance is critical for zoning, regionalization, and compartmentalization decisions and to demonstrate freedom, although interpretation of zone size and application differs among trading partners.

**□ Regarding response and control:**

- This topic was not the primary focus of the conference.
- Conference attendees reiterated the importance of rapid depopulation and contingency plans for disposal, cleaning and disinfection.
- Although successful in many cases, stamping out programs need assessment given the current global situation (e.g. very large farms) and tools available (e.g. effective vaccines)

□ **Regarding trade risk mitigation:**

- Risk varies by commodity.
- Trade in genetics/breeding stock is vital for global animal health and production.
- Safe trade in poultry and poultry products (including permitting) is possible.
- Transit restrictions complicate safe movement.
- Isolation of infectious low pathogenicity avian influenza (LPAI) virus in poultry muscle is rare; therefore, trade in poultry meat is low risk with respect to LPAI transmission. Experimentally, pasteurization and cooking eliminate virus from the product; yet, trade restrictions on heat-treated poultry meat remain.

□ **Regarding research:**

- Identification of multifactorial determinants of animal health risk is needed to support production, risk assessment, surveillance, and intervention strategies.
- Integrated approaches to influenza research, surveillance, and control across species are needed. Researchers should share results rapidly and widely.
- Improved technologies are needed. Newer technologies and practices can provide new tools in surveillance and response, through improved genetics, diagnostics, laboratory networks, genomic sequencing, recombinant vaccines, and DIVA strategies.

□ **Regarding vaccination, which was the most commonly mentioned topic throughout the conference:**

- Conference attendees hold diverse opinions about the use of vaccination to control an AI outbreak.
- Generally, we agree that vaccination should not be considered as a permanent solution. In contrast, vaccination can serve as a key risk reduction strategy and a valuable tool.
- Dogma is that vaccine use precludes trade. However, tools such as targeted or emergency vaccination programs, allow vaccine to be used to successfully control disease and trade safely.
- The need or risk/benefit analysis for vaccination should be reviewed regularly and an exit strategy developed as a condition of use.
- Some cases support vaccination as a tool to reduce economic impact (when trade is not a consideration) or reduce risk of human infection.
- Vaccine might not be available or might be poorly matched with field virus. Vaccine deployment challenges exist.



## Recommendations

The following recommendations were presented by meeting participants during a facilitated discussion at the conclusion of the conference:

### ☐ Recommendations and considerations for updating International Standards

1. To update and clarify some of its recommended standards and concepts, the World Organization for Animal Health (OIE) should consider reviewing the *Terrestrial Code Chapter 10.4: Infection with Avian Influenza Viruses*. Specifically, it is recommended that the OIE:
  - a. Clearly differentiate commercial poultry flocks (whose products, such as hatching eggs, day-old chicks, fresh or frozen poultry meat, enter into international commerce) from non-commercial poultry flocks (such as backyard chickens) by revising the OIE definition of “poultry.” Specifically, a clear epidemiological distinction between commercial and non-commercial poultry and related appropriate trade restrictions should be made. Findings of AI introduced by wild birds into non-commercial flocks should not affect trade.
  - b. Consider reducing the time period to regain freedom when the epidemiologic investigations demonstrate that wild birds were likely the source of introduction in an outbreak, and spread between commercial poultry flocks is not occurring (no secondary lateral spread).
  - c. Provide clear recommendations for the appropriate application of vaccine as an outbreak management tool. These recommendations need to clearly state that such use of the vaccine should not impede or prohibit safe trade.
  - d. The OIE Code provides standards for the establishment and maintenance of zones for the purpose of animal disease control in general. Consider developing AI-specific standards for the establishment and maintenance of zones for the purposes of AI control and trade continuity. Also clearly define the conditions for zones where vaccination is practiced.
  - e. Given the number of methods that are applied for stamping out and disinfection, provide clear guidance on time to regain freedom after an AI outbreak. For example, when does the 3 month “clock” start when composting, fallowing, or barn heating techniques are employed as disinfection tools?
2. Convene an ad hoc Group of subject matter experts to develop a specific chapter on biosecurity principles and practices. While biosecurity is referenced in many chapters, and several of the recommendations within a code chapter may include some biosecurity recommendations, currently the Code does not have a dedicated chapter on biosecurity.
3. Display more prominently, or make more accessible on its public website, the link to the database or other information so that trading partners can easily verify disease freedom.
4. Considering avian influenza will remain a global issue and concern, encourage Member countries to share surveillance data, information related to successful response efforts, and experiences on the successful application of OIE standards that allow trade.

### ☐ Recommendations for trading partners and OIE Member countries

#### Member Countries who trade should:

1. Hold each other accountable for their compliance with international standards. When Member countries have proposed, discussed, and adopted such standards, domestic regulations should be changed accordingly to meet international commitments and obligations.
2. Find ways to maintain trade in certain commodities when the risk is appropriately addressed. Even in outbreak situations, trade in certain poultry commodities presents a negligible risk of introducing AI.

Examples include day-old chicks and hatching eggs for breeding stock, and cooked poultry meat. These commodities are important for the economy and food security of importing countries and domestic poultry industries rely on imported breeding stock.

3. Be encouraged to establish bilateral or multilateral agreements during “peacetime” which recognize each other’s zones. As evidenced by many examples presented at this conference, zoning has been successfully applied for poultry trade between OIE Member countries. Mutual recognition is essential to this success. Share surveillance data between animal health authorities, the private sector, and trading partners.
4. Encourage animal health authorities, the private sector, and trading partners to share surveillance data.

#### Recommendations for animal health authorities

##### **Authorities should:**

1. Link compensation for producers to compliance with biosecurity standards. Numerous examples presented throughout this conference have demonstrated how compensation practices have contributed to successful response and eradication efforts.
2. Closely supervise all parties, such as contract workers, that are recruited to assist official workers in a response to ensure they are complying with biosecurity measures.
3. Consider establishing regulatory requirements for commercial poultry farm biosecurity to prevent the introduction of AI, by enhancing existing good agricultural practices intended to protect public health (e.g. *Salmonella spp.* control programs).
4. Ensure to trading partners the safety of products exported from and through regions where vaccination is practiced by demonstrating adequate oversight of zones, good surveillance, and verification of vaccine safety and efficacy where vaccination is practiced.
5. Not prohibit the transit of poultry or poultry products through airports in or near affected zones, where commodities can transit safely without risk, and be encouraged to develop contingency plans to keep airports open to poultry trade during an outbreak, and base any restrictions on grounded science.
6. Base ground transit restrictions for poultry and poultry products on science-based risk assessment. Generally, the risk of transmission during ground transit is very low, can be mitigated, and should not result in trade restrictions.
7. Share surveillance data between animal health authorities, the private sector, and trading partners.
8. Conduct active wild bird surveillance to track and monitor AI viruses in the wild bird population.

#### Recommendations for the poultry industry worldwide

##### **The private industry sector should:**

1. Use an adaptive approach to biosecurity plans, which is beneficial to the industry at all times, regardless of whether an AI outbreak is occurring. Biosecurity plans should be developed and practiced before an outbreak occurs, not as a reaction to an outbreak.
2. Maintain continuous awareness of the level of risk, and not become fatigued during outbreaks or complacent between them.
3. Implement biosecurity plans, which should include continuous monitoring for compliance and effectiveness through inspections and audits.
4. Together with animal health authorities, develop contingency plans for disease control activities, such as carcass disposal. Share surveillance data between animal health authorities, the private sector, and trading partners.

## Concluding remarks

**Dr. John Clifford, U.S. CVO and Mr. Jim Sumner, USAPEEC President**

Thanks to all who made this possible and for those who attended. This is a worldwide issue and the dialogue needs to continue.

We are facing a new order where AI is going to be everyone's problem. Once the virus gets into the migratory bird flyways, no country can be immune.

There were no secrets this week; everyone put their issues on the table. We have developed trust and mutual understanding, which are a very important part of our trade decisions. We need to make our decisions on the basis of science; if we did, the trade repercussions would be must less severe.

We all have a lot to learn. All countries need to practice zoning. Vaccination should be a tool in the tool box, but of course one that is used as a last resort. Unless we can get countries to agree that vaccination is an appropriate tool that doesn't necessarily prohibit trade, it is not a tool we can use.

This was a tremendous week and we were glad to help sponsor it. Thanks to all. This is something we should be doing on a regular basis.



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**International Conference on Avian Influenza and Poultry Trade  
Baltimore, Maryland USA – June 22-24, 2015**

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**International Conference on Avian Influenza and Poultry Trade  
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8.	Joel	Brandenberger	National Turkey Federation
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13.	Giuseppe	Caminiti	Canadian Hatching Egg Producers
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26.	John	Glisson	USPOULTRY
27.	Mario José	González Herrera	Disatyr, S.A
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29.	Nelva	Grando	BRF
30.	Chad	Gregory	United Egg Producers
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33.	Michael	Hall	Canadian Livestock Genetics Association
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36.	Robin	Horel	Canadian Poultry & Egg Processors Council
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40.	Jorge	Jimenez	Asociacion de Avicultores de El Salvador
41.	Alice	Johnson	Butterball.com
42.	Bob	Kelly	Hidden Villa Ranch
43.	Kenneth	Klippen	National Association of Egg Farmers

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	<b>First Name</b>	<b>Last Name</b>	<b>Company</b>
44.	Michelle	Kromm	Jennie-O Turkey Store
45.	Julian	Madeley	International Egg Commission
46.	Guilherme	Marques	Ministry of Agriculture, Livestock and Food Supply of Brazil
47.	Shelly	McKee	USA Poultry and Egg Export Council
48.	Jean	Murphy	USAPEEC
49.	Neil	Newlands	Egg Farmers of Canada
50.	Victoria	Norgbey	Greater ACCRA Poultry Farmers Association
51.	Bill	Northey	Iowa Department of Agriculture and Land Stewardship
52.	Terrence	OKeefe	WATT Global Media
53.	Adriaan	Olivier	Klein Karoo International Pty Ltd
54.	Randy	Olson	Iowa Poultry Association/ Iowa Egg Council
55.	Kenneth	Opengart	Keystone Foods
56.	Juan Miguel	Ovalle	APA
57.	Ashley	Peterson	National Chicken Council
58.	Lisa Wallenda	Picard	National Turkey Federation
59.	Marshall	Putnam	Ceva
60.	Isabel	Quintero Moreno	Ministry of Agriculture Development
61.	Javier	Ramirez	Lohmann Tierzucht GmbH
62.	Don	Ritter	Mountaire Farms Inc.
63.	Rafael	Rivera	U.S. Poultry & Egg Association
64.	Allison	Rogers	National Chicken Council
65.	Greg	Rosales	Aviagen
66.	Will	Sawyer	Rabobank International
67.	Travis	Schaal	Hy-Line International
68.	Roberto	Se&as	Mexican Association of Poultry Producers
69.	John A.	Smith	Fieldale Farms Corporation
70.	Sara	Steinlage	Elanco Animal Health
71.	Jim	Sumner	USA Poultry & Egg Export Council / World Poultry Foundation
72.	Huseyin	Sungur	Turkish Egg Producers Association
73.	Gary	Thornton	WATT Global Media
74.	Jose Miguel	Torres	Agrosuper
75.	Donald	Tuckler	ANAPA (Egg, Poultry and Animal Feed Nicaraguan Association)
76.	Gustavo	Valenzuela	Cargill Honduras
77.	Fernando	Vargas	MERCK Animal Health
78.	Gustavo	von Bassenheim	Ovobrand S. A.
79.	Matthias	Voss	Poultry Veterinary Study Group of EU
80.	Kendra	Waldbusser	Pilgrim's
81.	Dalybert	Weastler	Avicola Villalobos, S. A/ Delegada Titular del Colegio de Médicos Veterinarios
82.	Damon	Wells	National Turkey Federation
83.	Greg	West	National Pasteurized Eggs Inc
84.	Scott	Westall	Case Farms
85.	Ben	Wileman	Willmar Poultry Company/ AgForte
86.	Daniel	Wilson	Rose Acre Farms
87.	Helen	Wojcinski	Hybrid Turkeys a division of Hendrix Genetics

## List of Acronyms

APHIS	Animal and Plant Health Inspection Service
ARS	Agricultural Research Service
CDC	Centers for Disease Control
DHS	Department of Homeland Security
FAS	Foreign Agricultural Service
FBI	Federal Bureau of Investigation
FDA	U.S. Food and Drug Administration
FSIS	USDA Food Safety and Inspection Service
IS	International Services
NASAHO	National Association of State Animal Health Officials
NIES	National Import Export Services
NIFA	National Institute of Food and Agriculture
SPRS	Surveillance, Preparedness, and Response Services
STAS	Science, Technology, and Analysis Services
UMN	University of Minnesota

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