

## **Lessons Learned from the 2015 HPAI Outbreak Layer Industry Perspective**

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### **Importance of communication and information sharing:**

In today's world, inter-state movement of poultry, poultry products and feed ingredients is extensive. Hence, the spread of diseases can be as extensive. The control of transboundary animal diseases, such as avian influenza, necessitates transboundary collaboration and sharing of information.

By Mid-April 2015, and before Iowa had reported the first case of highly pathogenic avian influenza (HPAI), more than 25 confirmed cases of HPAI were detected in Minnesota. The layer industry in Iowa, the number one egg producing state, was under pressure striving for getting information about the location of these "hot areas" in order to avoid traffic through them. While the disease was spreading quickly, inter-state communication involving the level of stakeholders was lacking. It was difficult in that time of emergency to start the necessary communication with stakeholders in other states. The extent of movement through the control zones in association with such lack of information was not known.

### **Biosecurity challenges:**

Seventy one cases of HPAI were confirmed in Iowa between 4/13/2015 and 6/17/2015. These included 36 cases in layer chickens. The layer industry focused on enhancing operational biosecurity measures to try to prevent infections. Preventing visitors, restricting movements and extensive use of disinfectants at each step of operational procedures had become basic practices. In such a predominantly agricultural community as in the mid-west, however, more biosecurity measures were required. For example, it was important to map employees' residences in relation to infected zones and to pay attention to where their households work. Imposing self-quarantine on high risk individuals was difficult in the light of the lack of information about the location of infected zones when the outbreak started. Later on when more information became available, better control was attained. Structural biosecurity was not ideal in some old facilities. Operational biosecurity was challenged by high loads of virus due to delayed depopulation of infected premises. Producers had minimal control on the biosecurity measures taken by contractor crews. These crews were moving from infected premises to hotels, restaurants, etc. Inevitable movement of products added another burden on biosecurity. Most layer producers voluntarily stopped bird and manure movements and discontinued collection of mortality by renderers.

### **Early detection is a prerequisite for successful control:**

Early detection of new infections would help the containment of outbreaks before viruses replicate to high loads with subsequent potential of further spread. It also buys time ahead of increased mortality as depopulating live birds is much easier than having to deal with thousands of dead or decaying birds.

Early in the outbreak, testing was done to check flocks having high mortality. Later, testing frequency increased to include surveillance of normal looking flocks and this helped in early detection and better preparedness for handling new cases. It was noted in the majority of the affected flocks that the clinical signs and mortality started in one spot of the houses, suggesting a distinct point of virus entry. However, widespread mortality in some flocks was also noted. The industry quickly moved to using sampling protocols beyond that suggested in published guidance. More sample pools per flock were collected to cover as much dead birds as possible and to represent different locations of suspected houses. The laboratories were testing samples around the clock. The capability of the laboratories to handle large volumes of samples with reasonable turnaround time was a significant strength.

The virus appeared to be getting hotter and adapting as it was circulating in commercial flocks. In some layer flocks that tested negative daily, increased mortality was observed on the same day as the first positive test result. Positive pullets experienced very low mortality.

### **Strict control strategies work:**

The evolution of the control strategies from focusing only on premises that test positive to focusing on the bigger picture in the control zones greatly helped the successful containment of the outbreak. In March and April of 2015, attention was given to premises reporting confirmed positive PCR test. Handling contact flocks that were negative and movement of negative flocks from or into high risk areas were the producer's decision. Limited indemnity funding resulted in creating such a situation where a given flock would not be considered in the logistics of the outbreak control unless it was infected. In May and June, containment efforts were more robust and included procedures to prevent the spread of the disease to negative flocks. That coincided with a parallel evolution of testing premises located in the control zones. The process was more comprehensive and more organized as the outbreak was coming to an end.

### **Depopulation and disposal limitations:**

Quick depopulation and disposal of infected birds are critical for the successful control of HPAI. The use of carbon dioxide kill carts was labor demanding, and no more than 200,000 birds could be killed daily using this method. With the availability of crews and carbon dioxide supply, it could take up to 20 days to finish depopulating a layer complex having 4 million hens. On the contrary, ventilation shut down was an easy and efficient depopulation method. It was a good method to quickly stop virus multiplication in birds and stop its exhaust from the house with minimal resources needed.

It was in the best interest of the layer industry to quickly depopulate positive premises and stop the spread of the disease. Some producers chose to quickly kill infected birds and lose indemnity rather than wait for indemnity paperwork to be completed before depopulating infected flocks.

Disposal methods were affected by state jurisdictions. Disposal methods also needed to be linked to depopulation. It took a long time to get approval for landfill use but its use was discontinued shortly thereafter. The use of landfill was limited by logistic requirements of transportation, biosecurity, cost and public perception. Incinerators capacity was lower than anticipated and the cost of their operation was high. Burial worked well for some premises but it was not a valid option for other premises. Outside composting was used in some cases where appropriate compost sites were available. When done correctly, composting generates sufficient heat to deactivate the virus. However, until this temperature is attained, reducing the potential spread of the virus and the use of sufficient capacity of pest control could be a challenge.

### **Cleaning and disinfection:**

Cleaning and disinfection went well in most premises. Insufficient understanding of the structure of poultry houses created some issues with contracted cleaning crews. Cancellation of the requirement of written cleaning and disinfection plan helped in reducing the paperwork load that producers had to handle during the outbreak. Manure was required to be piled for 90 days then deemed non-contaminated and approved for land application by September 2015. It is not clear if this procedure would be applicable if an outbreak occurs in winter months.

### **Conclusion:**

Consistency of response policies and streamline of the federal and state authorities with the industry are important for proper preparedness for HPAI. Common mapping methodology and established information sharing and communication protocols would enhance outbreak control efforts and ease a coordinated market flow and disease control measures.