2016 HPAI Preparedness and Response Plan

Animal and Plant Health Inspection Service

Veterinary Services

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Executive Summary

Since it was first identified in the United States in December 2014 in the Pacific Northwest, highly pathogenic avian influenza (HPAI) has been detected in commercial and backyard poultry flocks, wild birds, or captive wild birds in 21 States. With the last case of the spring outbreak identified in June, 2015, a total of 211 commercial and 21 backyard poultry premises had been affected. This resulted in the depopulation of 7.5 million turkeys and 42.1 million egg-layer and pullet chickens, with devastating effects on these businesses, and a cost to Federal taxpayers of over $950 million.

Genetic analysis has shown that a comingling of migratory birds between northeast Asia and Alaska allowed for re-assortment of Asian HPAI strains with North American low pathogenic avian influenza (LPAI) viruses. The resulting Eurasian-American (EA/AM) HPAI viruses that infected wild birds and domestic poultry earlier in 2015 serve as a potential threat to poultry this fall and winter. Wild birds, particularly resident and migratory dabbling ducks, appear to be the reservoir for these viruses.

USDA, along with its partners, has learned a great deal through our 2015 HPAI response activities. To prepare for additional outbreaks that could occur in 2016 or later, our planning activities assumed a worst-case scenario beginning in September 2015, with HPAI occurring simultaneously in multiple sectors of the poultry industry throughout the nation. Under this scenario, 500 or more commercial establishments of various sizes across a large geographical area could be affected.

Our plan for preventing and responding to future HPAI cases, in collaboration with industry and State partners, includes:

- Promoting improved on-farm biosecurity practices in order to prevent future HPAI cases to the greatest extent possible;
- Improving HPAI surveillance in wild birds as a means to provide “early warning” risk information to States and industry;
- Expanding Federal, State and industry response capabilities, including availability of personnel, equipment, and depopulation, disposal and recovery options;
- Improving our capabilities to rapidly detect HPAI in domestic poultry and to depopulate affected flocks within 24 hours to reduce the environmental load of HPAI viruses and their subsequent spread;
- Streamlining the processes for payment of indemnity and the cost of eliminating viruses so that producers receive a fair amount quickly, to assist them in returning to production;
- Enhancing our ability to communicate in a timely and effective way with producers, consumers, legislators, media, and others regarding outbreaks and other information; and
- Making preparations to identify and deploy effective AI vaccines should they be a cost beneficial addition to the eradication efforts in a future HPAI outbreak.

Finally, it is important to note that this plan builds upon the Foreign Animal Disease Preparedness and Response Plans (FAD PReP) and Continuity of Business/Secure Food Supply plans that were already in place and used during the 2015 outbreak and are available on the APHIS website.

Introduction

Highly pathogenic avian influenza (HPAI) was identified in the United States in December 2014 in the Pacific Northwest. Genetic analysis of the early viral isolates indicated that comingling of migratory birds between northeast Asia and Alaska allowed for entry of HPAI viruses into North America. Subsequent recombination of these Asian HPAI strains with North American low pathogenic avian influenza (LPAI) viruses resulted in Eurasian-American (EA/AM) HPAI viruses that have infected wild birds and domestic poultry.

Wild birds, particularly dabbling ducks, appear to be the reservoir for these viruses that spread into the Pacific, Central and Mississippi migratory bird flyways. As of the last identified case on June 17, 2015, HPAI viruses have been detected in commercial and backyard poultry flocks, wild birds, or captive wild birds in 21 States. Nine States have had infections in commercial poultry, with 211 premises affected. Eleven States have had infections in backyard flocks, with 21 premises affected. Efforts to control HPAI have resulted in the destruction of 7.5 million turkeys and 42.1 million egg-layer and pullet chickens, with devastating effects on these businesses and at a cost to Federal taxpayers in excess of $950 million.

While a low number of HPAI cases were seen between December 2014 and the end of March 2015, 184 of the 211 commercial cases occurred in the upper Midwest in April and May. This spike in cases drastically decreased in June, due to both the control and biosecurity measures applied as well as the onset of summer heat.

The decline in HPAI detections provided an opportunity to enhance prevention efforts and prepare for additional backyard and commercial poultry cases that may occur when birds migrate south from their northern breeding grounds. While HPAI infections since December 2014 have been identified in three of the four U.S. flyways, we expect HPAI viruses will be brought to the Atlantic flyway by migrating ducks, if they are not already present but as yet undetected in the resident wild duck population.

USDA, along with its partners, has learned a great deal through the experience of responding to the largest animal health event in our history. Throughout the experience, we have altered and improved our response capabilities and processes in real time to provide the most effective services possible. We collected scientific data on the field viruses and from affected premises. We listened to producers, our State partners, academia, our responders, and other stakeholders to identify additional means for improvement and to be better prepared should cases return in the future. This plan reflects that learning experience.

Our fall planning activities assumed a worst-case scenario beginning in mid-September 2015, with HPAI occurring simultaneously in multiple sectors of the poultry industry throughout the nation. Under this scenario, 500 or more commercial establishments of various sizes across a large geographical area could be affected, including commercial high-volume poultry establishments, commercial high-value poultry establishments (game or specialty birds), the live bird marketing system, and backyard flocks in the 20 States that represent a composite of the top broiler, turkey, and layer producing states. The 20 States are Alabama, Arkansas, California, Delaware, Georgia, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, Ohio, Pennsylvania, South Carolina, Texas, and Virginia.

Based on this worst-case scenario, APHIS focused our planning on the following areas:

I. Preventing or Reducing Future Outbreaks
II. Enhanced Preparedness
III. Improved and Streamlined Response Capabilities
IV. Preparing for the Potential Use of AI Vaccines

Each section of this plan describes activities APHIS, in collaboration with State and industry, has conducted to improve preparation and response capabilities in these four areas. Links to supporting documents are listed at the end of each section.

APHIS has undertaken extensive response planning efforts for many years. This plan describes the recent efforts that APHIS has taken to build upon the Foreign Animal Disease Preparedness and Response Plans (FAD PReP) and Continuity of Business/Secure Food Supply plans that were already in place and used during the 2015 outbreak, and are available on the APHIS website. Also, this plan does not address APHIS response activities should HPAI become a zoonotic agent; planning for that possibility has been in place for several years through the interagency development of the North American Plan for Animal and Pandemic Influenza.

Finally, it is important to emphasize that this plan is a "living document." APHIS will continue our planning activities to refine our approach and processes over time. We welcome comments at any time to assist us in this process.

This January 2016 edition includes a summary of industry preparedness, a description of flat rate payments for virus elimination, and an update of APHIS' vaccination policy.

I. Preventing or Reducing Future Outbreaks

The best defense against any catastrophic disease is to avert outbreaks in the first place. APHIS, States, and producers all have a role in preventing or reducing HPAI this fall and winter and beyond. We have taken the following steps to improve the Nation's ability to prevent future HPAI cases:

1. We are strengthening biosecurity.

Biosecurity is a cornerstone of livestock and poultry production systems. *Biosecurity* is a broad term to mean anything done to keep diseases out, from the structure of the building (structural biosecurity) to on-farm procedures (operational biosecurity), such as providing boot-washing stations at the entrance to barns and limiting visitor traffic. While standard biosecurity efforts practiced by the poultry industry may have been sufficient in the past, evidence of farm-to-farm spread of the HPAI virus strain circulating in the Midwest shows that stricter biosecurity is needed.

Since the beginning of the current outbreak, APHIS has collaborated with affected producers, States and academic institutions to collect scientific and technical information as part of our epidemiological investigations. Through this partnership, we collected observational data on poultry farms that included biosecurity practices; conducted a case-control study, which analyzed the data from HPAI-affected and unaffected farms; studied the genetic makeup of the virus; analyzed air samples and used modeling to assess the risk of windborne spread; and sampled wildlife near affected farms.

Through this work, APHIS concludes that wild birds were responsible for introducing the HPAI virus into the environment, and from there it spread to commercial poultry; but given the number and proximity of farms affected, the virus likely spread in other ways as well. While it is not possible to identify on each affected facility the specific pathway or pathways by which HPAI entered the premises, our epidemiologic reports identified potential risk factors for the HPAI virus, such as sharing equipment between farms, entry of small wild birds into barns, proximity to other affected farms, and rendering dead birds. These data underscore the need for producers to implement their own, site-specific biosecurity plans.

Producers are responsible for biosecurity on their premises, and APHIS and industry organizations can help them understand how to best prevent this new infectious disease threat. Most of the enhancements to biosecurity that can be implemented by this fall are operational. Further, because multiple pathways for infection are possible, all likely sources of virus introduction should be mitigated, and producers should work to minimize the risk of spread between poultry operations and between individual houses on the same operation.

To support producers in this effort, APHIS has developed educational materials and a biosecurity self-assessment checklist, which are available online or as a webinar through the U.S. Poultry and Egg Association. As we improve our understanding of what biosecurity measures will be most effective against HPAI, we will update these publications and communicate them to poultry producers. We will also continue to engage other Agencies that conduct on-farm regulatory functions (Agricultural Marketing Service, Food and Drug Administration, etc.) and provide them with suggested biosecurity protocols for their activities.

Additionally, APHIS is publishing an interim rule on HPAI indemnity that will contain a provision requiring all future HPAI-affected commercial poultry producers to self-certify that biosecurity procedures were in

place at the time HPAI was detected. This represents the first step in creating a system of greater accountability for biosecurity. Following this, we will collaborate over the next year with industry to design a biosecurity auditing system. An industry-driven initiative or an addition to the National Poultry Improvement Plan are two possible approaches.

Links to supporting documents:

- HPAI Epidemiology Reports
    - June, 2015
    - July, 2015
    - September, 2015
- Biosecurity self-assessment and educational materials
- Biosecurity Factors and the Introduction and Spread of HPAI: Findings from Epidemiological Studies

2. We are enhancing wild bird surveillance.

Wild birds, particularly resident and migratory dabbling ducks, serve as a reservoir for HPAI viruses. Therefore, poultry producers and disease response officials will benefit from a better understanding of the extent of these viruses in wildlife.

In June 2015, the Interagency Steering Committee for Surveillance for Highly Pathogenic Avian Influenza in Wild Birds published its Strategic Plan and Surveillance Plan for detecting and monitoring avian influenzas in the United States. Surveillance began in July; objectives are to define the distribution, spread and genetic makeup of these viruses in wildlife. This surveillance is being conducted collaboratively by USDA, the Department of Interior (DOI) U.S. Geological Survey, the DOI Fish and Wildlife Service, and State departments of natural resources.

We anticipate that, during the year beginning July 2015, over 40,000 wild bird samples will be collected across the United States and evaluated for the presence of HPAI viruses. As of December 11, 27,341 samples had been collected with two detections of AI, although no virus was isolated in either of these samples.

USDA will share data from this surveillance throughout the year with poultry producers and other stakeholders in order to communicate ongoing or changing risk of exposure to HPAI and to encourage enhanced biosecurity. This surveillance report, entitled "Wild Bird Positive Highly Pathogenic Avian Influenza Cases in the U.S: July 2015 to June 2016," is available on the APHIS web site and is updated weekly.

Links to supporting documents:

- US Interagency Strategic Plan for Early Detection and Monitoring for Avian Influenzas of Significance in Wild Birds
- 2015 Surveillance Plan for Highly Pathogenic Avian Influenza in Waterfowl in the United States
- Wild Bird Avian Influenza Surveillance Procedure Manual
- Wild Bird Positive Highly Pathogenic Avian Influenza Cases in the U.S.: July 2015 to June 2016

II. Enhanced Preparedness

With State and industry partners, APHIS has been evaluating our response throughout the 2015 HPAI event and adjusting activities whenever possible. In preparation for future outbreaks, we strived to identify gaps and to expand resources where necessary, in order to be better prepared in case the disease returns this fall or winter. Consequently, we have undertaken the following actions to enhance our preparedness:

1. We facilitated improved State and industry response capabilities.

APHIS undertook a nationwide review of non-Federal emergency resources. APHIS surveyed State and industry partners for information about many aspects of HPAI planning: personnel, equipment, emergency plans, and disposal options, among others.

APHIS was especially interested in hearing from the 20 States comprising the top U.S. broiler, turkey, and layer production states identified in the Introduction section of this plan. All 50 States and 5 U.S. Territories responded to the survey by July 24.

From this analysis, we conclude that the 20 critical worst case scenario States have all made significant efforts in implementing detection, preparedness, and response capabilities for future HPAI cases. The majority have also collaborated with their industries to improve education and awareness about HPAI. All 20 critical States have implemented one or more practices to increase biosecurity and address gaps. However, there are areas where improvements are needed.

It should be noted that this summary represents the status of State preparedness reported as of July 24, 2015. Completion of this survey was used by the States as a self-assessment of their readiness. Since that time, APHIS, through the VS Assistant Directors posted as State liaisons throughout the U.S., have collaborated with their counterpart State animal health officials to mitigate, to the greatest extent possible within State resources, any preparedness gaps that were identified.

APHIS deployed a similar survey to evaluate poultry industry resources, with a response deadline from APHIS deployed a similar survey to evaluate poultry industry resources. This summary represents poultry industry preparedness as of August 28, 2015 and should not be considered a metric on current industry preparedness levels Industry has implemented a number of improvements in HPAI preparedness. However, there are recommendations that include ensuring that premises IDs are entered in EMRS to facilitate response activities and that the development, implementation, and verification of site-specific biosecurity plans are considered a priority.

Links to supporting documents:

- Summary Report of State Survey Responses
- Summary Report of Industry Survey Responses

2. We have increased our ability to deploy personnel to an outbreak

During the 2015 outbreak, VS used Incident Command System (ICS) principles to structure our response activities. A National Incident Coordination Group (ICG) provided overarching policy and direction, while response operations were conducted by four Incident Management Teams (IMTs). Each IMT had a color label for management purposes (Gold Team, Green Team, Blue Team, and Red Team). These IMTs

worked in coordination with States, although the extent of the relationship varied depending on the resources of the individual State. In August 2015, VS implemented a fifth IMT – the Indigo Team – that will be available for future outbreaks.

In addition to strengthening our IMT structures, APHIS has worked to augment our rosters of deployable personnel available to operate under IMT leadership. In June 2015, APHIS established a multiagency coordination group (MAC). This change provided the leadership to support an APHIS-wide response needed during the recent outbreak, and will serve as the basis to solicit a USDA-wide deployment effort, if needed in the future.

In preparation for the fall, we analyzed deployments during the current outbreak and identified the personnel needs by type to respond to the fall worst-case scenario. An APHIS-wide deployment and mobilization strategy has been developed to more fully use existing employees throughout our agency. Also, we have made changes to the Resource Ordering and Status System (ROSS), a computer-based system that is used to identify and track resources that are needed to support emergency response. These changes have modernized dispatching and recruiting, and APHIS now has identified 30 dispatchers and 4 logistics management specialists to support the dispatch process. Finally, emergency funding has enabled us to hire term personnel (temporary employees hired for a defined period of time, with the possibility of extending) before a response is needed in the fall or winter. This emergency hiring effort will include up to approximately 350 veterinarians and animal health technicians, as well as administrative support staff.

Beyond APHIS, we have enhanced our plans for continued activation and deployment of the National Animal Health Emergency Response Corps (NAHERC). We also reviewed possible sources of additional personnel available through existing contracts, memoranda of understanding (MOUs), and agreements and updated these in light of anticipated needs. Fellow USDA agencies and States also identified personnel that could assist in future responses and shared this information with us.

Links to supporting documents:

- HPAI Responders by Position Type

3. We have enhanced training, safety and IT support for responders.

APHIS had a robust suite of emergency response training materials available at the start of the current outbreak. These include training on topics such as bird handling, sampling, depopulation, biosecurity/PPE, safety, appraisal/indemnity, case management, and cleaning and disinfection. We have leveraged these existing materials and resources to provide ongoing training to responders throughout the current outbreak. We have updated and augmented many of the materials in advance of the fall, and are preparing to deliver just-in-time training as events warrant. Specific accomplishments include providing on-site support, 22 webinars and 11 training sessions to enhance our use of Emergency Management Response System (EMRS), our information technology system.

We are also continuing our efforts to ensure the health and safety of responders. This includes enhancing a monitoring process supported by APHIS, Centers for Disease Control and Prevention (CDC), and State/local public health departments to ensure proper follow-up if HPAI responders exhibit symptoms compatible with influenza during mobilization and the 10 days following their demobilization. In addition, APHIS continues to expand health and safety guidance information for responders and training for individual responders on specific job hazards related to avian influenza response activities. The Agency has a cadre of highly trained Safety Officers available and assigned for emergency response

activities. They are also responsible for the site-specific health and safety programs for emergency response activities. These Safety Officers also serve as a liaison with the State/local public health departments. APHIS also has developed a larger group of trained Safety Coordinators to support the Safety Officers for the response activities. APHIS is conducting additional training for all APHIS Safety Officers in September to help ensure sufficient safety resources and consistency in implementation of all SOPs.

APHIS uses EMRS as the information technology system of record for the HPAI response. Outbreak response data is captured electronically and forms the basis of reporting and decision making. The HPAI response showcased challenges in implementing the system, which had not yet been widely adopted, on a large scale. We identified areas where training, overall ease of use, data reliability, data standardization, and data extraction need to be improved. A multi-pronged approach has been implemented to fill these gaps. A newly established National Situation Unit now provides quality assurance and control capabilities, enforces data standardization and data reliability. A working group of information technology and response specialists are building new reports to ease data extraction. We also are developing job aids and just-in-time training for IMTs to support usability in the field, as well as training for VS district offices and State Animal Health Officials.

Links to supporting documents:

- Bird Infections with Highly Pathogenic Avian Influenza A (H5N2), (H5N8), and (H5N1) Viruses: Recommendations for Human Health Investigations and Response
- Health, Safety and Environment Protection – Quick Response Card
- Responder Safety and Health Guide
- Ready Reference Guide – Introduction to Emergency Management Response System (EMRS) 2
- Ready Reference Guide – Understanding the EMRS2 Interface

4. We improved our capacity for depopulation and disposal.

APHIS focused considerable effort in the area of depopulation and disposal during our fall planning activities. The size of the current outbreak clearly outstripped the capacity to depopulate flocks and dispose of carcasses. Additionally, a number of hurdles further delayed our ability to quickly use landfills and incinerators for carcass disposal, such as concerns over liability, environmental impacts, and public acceptance.

APHIS reviewed Federal and State statutes, rules, and regulations pertaining to carcass disposal in order to identify potential challenges and solutions to overcome them. APHIS developed disposal decision tools to assist responders with selecting the best option(s); these tools include decision guides, checklists and online training modules. APHIS has initiated contract actions to solicit vendors who can provide high-capacity mobile disposal/treatment technologies. In addition, APHIS has studied the demographics of poultry populations, developed mapping coordinates for rendering, landfill, and incineration facilities in the US, and linked these coordinates with a simple automated selection tool. Importantly, we also encouraged our State partners to assess their ability to perform depopulation and disposal and consider their options more broadly based on the poultry industry present in their States.

APHIS completed an inventory of APHIS and other federally owned depopulation and disposal equipment, and we asked States to do the same. Foam depopulation and composting for disposal require large volumes of water and carbon sources, respectively; we identified possible water and carbon sources and alternatives to reduce the need to use water in freezing temperatures. Finally, we

strengthened relationships with other USDA agencies such as Natural Resources Conservation Service (NRCS) and Farm Service Agency (FSA) to further support depopulation and disposal. APHIS continues to work with our Federal, State and industry partners to find solutions to these challenges.

Links to supporting documents:

- Map Book, including
    - Poultry inventory hotspot examples
    - Disposal resources (landfills, renderers, and incinerators) by Flyway
    - Poultry distribution and density maps by industry sector and Flyway
    - National commodity maps
- Environmental Statutes Impacting HPAI Response Operations
- Inventory of Disposal Resources (including locations of landfills, incinerators, and renderers)
- Potential Carbon Sources for Composting

5. We inventoried and enhanced our equipment and supplies.

APHIS reviewed our inventories of equipment and supplies to ensure that we have sufficient stocks available for the fall. The National Veterinary Stockpile (NVS) has an assortment of supplies and equipment including disinfectant, spill berms, pressure washers, portable collapsible tanks, sprayers, and brushes. We also evaluated our existing contracts so that additional materials can be quickly purchased as needed this fall and winter. Our operating standard is to stockpile sufficient quantities of personal protection equipment to supply 1500 responders for 60 days, changing protective equipment 6 times per day. Frequently requested items are available using multiple vendors through the Government Services Agency schedules. Replenishment of supplies will be initiated as needed. We also asked States to perform similar inventories, and to estimate the length of time their supplies would last in the face of an outbreak. Certain States indicated they have foam units, quarter-ton trucks, pressure washers, and personnel to support the response.

Links to supporting documents:

- Equipment and Supplies for a Worst-Case Outbreak

6. We enhanced diagnostic laboratory preparedness.

APHIS worked closely with State diagnostic laboratories participating in the National Animal Health Laboratory Network (NAHLN) to assess diagnostic capacity nationwide and, more specifically, in those States included in our worst-case scenario. There are a total of 57 NAHLN laboratories nationwide that are approved to perform HPAI PCR testing. Based on a regular 8-hour shift in these laboratories, a total of over 30,000 samples per day across the network can be tested using currently available equipment and proficiency tested personnel. The actions identified in the NAHLN Operational and Emergency Activation Plan allow for options for increasing capacity at individual laboratories if needed in response to an outbreak. In addition to determining the baseline diagnostic capacity, these evaluations considered staffing plans and surge capacity, the availability of equipment, sampling supplies and media, and proficiency-tested technicians. We have added staffing at APHIS' National Veterinary Services Laboratories to increase our production of sampling media and worked with external vendors that supply reagents for diagnostic tests to make them aware of the possibility of increased demand of their products. Through our preparedness survey, we encouraged States to consider implementing barcoding of samples and to review shipping protocols in order to expedite confirmation of HPAI infection at a

NAHLN laboratory. We continue to communicate with NAHLN laboratories regularly regarding diagnostic testing protocols and their preparedness efforts.

Links to supporting documents:

- National Animal Health Laboratory Network (NAHLN) Operational and Emergency Activation Plan

7. We are assisting the zoological community in prevention and response.

Zoological facilities include zoos, wildlife sanctuaries, research, rehabilitation, training, or any facility that keeps captive wildlife as part of its mission. The occurrence of HPAI at such facilities would result in myriad challenges, including the intersection of animal health and wildlife conservation authorities at the Federal and State level, mitigation of risk to other zoological operations, and a heightened media and public interest in HPAI at any such facilities.

For over seven years, APHIS has worked extensively with zoological associations, States, and other stakeholders on issues surrounding emergency planning and preparedness for the zoological community. APHIS has worked to build a strong collaboration framework for effective planning, such as the HPAI Outbreak Management Plan for Zoos, developed jointly with the Association of Zoos and Aquariums, and multiple other stakeholders in 2008-2009. Information on all these efforts can be found at http://zahp.aza.org/ .

The current HPAI incident has redoubled APHIS' efforts to collaborate effectively with zoological stakeholders. A zoo unit was established under the HPAI National Incident Coordination Group that is working in partnership with other Federal Agencies, States, and zoological stakeholders to establish plans for responding to HPAI at zoological facilities, creating operational tools and guidance, addressing issues related to threatened or endangered species in captivity, and planning a multi-State tabletop exercise focused around HPAI in zoos. The existing dynamic partnerships from past and ongoing projects have been largely responsible for current progress on these complex issues.

Links to supporting documents:

- Concept of Operations Plan: Management of an Avian Influenza Outbreak at a Zoological Institution

8. We are improving public communications.

The HPAI outbreak elicited a high degree of interest and scrutiny from a wide range of constituencies—States, industry, legislators, media, consumers, trade partners—who have a keen interest in, or need to know, how USDA is responding to this significant disease situation. The breadth of audiences interested and the complex and rapidly changing situation made communications particularly challenging during the spring.

To aid our planning for a possible recurrence of the disease in the fall, APHIS/Legislative and Public Affairs (LPA) hosted an after-action hotwash this summer with public information officers (PIOs) from affected States to discuss lessons learned and changes that would improve communication. We also solicited feedback from industry communications officials and met with other USDA communications professionals to discuss priorities and best practices. After these discussions, our goal for future HPAI communications is to focus on strengthening our work in the following areas:

- Providing sufficient on-the-ground public information resources and support to IMTs, to help disseminate information quickly and directly to affected producers and communities;
- Coordinating with our Federal and State animal and public health partners and industry to share and synchronize messages to ensure consistency and accuracy;
- Proactively preparing and distributing information resources through our website and other channels; and
- Engaging early with legislators and community leaders regarding USDA's HPAI preparedness and response efforts.

In support of these goals, LPA has recruited additional PIOs from within APHIS and across USDA to deploy with each incident management team. We have created standard operating procedures and just-in-time training to ensure PIOs are prepared to provide critical communications support. APHIS has worked to streamline its notification processes to ensure that announcements of infected flocks are made as quickly as possible and reach all interested stakeholders. LPA has created several informational materials for poultry producers during the fall planning period that will help them understand what to do if they suspect their birds are infected and what to expect after a positive detection. Finally, LPA has initiated an HPAI-specific outreach campaign focused on the importance of biosecurity in keeping birds healthy. This campaign will be modeled on the Agency's successful Biosecurity for Birds campaign that targets backyard poultry producers.

To improve communications with producers whose facilities may be affected by HPAI, when a case is identified APHIS will assign a site manager to that producer. This individual will be the primary conduit for communication with that producer from the time the infection is identified through return to production a few months later. APHIS will to the greatest extent possible use local personnel to fill this role and only change a producer's site manager when absolutely necessary.

Links to supporting documents:

- APHIS HPAI website
- What to Expect if You Suspect factsheet
- HPAI: A guide to help you understand the response process (infographic)
- HPAI and Vaccine Use factsheet

III. Improved and Streamlined Response Capabilities

Because any delay in the response to HPAI and the clean-up of infected facilities can pose an increased risk of disease spread, APHIS has streamlined our capabilities to depopulate affected flocks, eliminate the virus from affected premises, and pay producers indemnity and reimburse other costs. The changes we are implementing include the following actions:

1. We evaluated the impacts of response actions.

As the number of HPAI-infected poultry operations peaked in April and May, the strain on Federal, State, and industry resources—and the profound effect on producers—became more and more apparent.

Response and compensation activities were sometimes slowed by the need for diagnostic confirmation of infection, the availability of personnel and equipment to conduct depopulation and disposal, and the need for various site-specific documents to support fair and accurate payments to producers. At the "2015 Avian Influenza Outbreak . . . Lessons Learned" conference in Des Moines, Iowa, on July 28-29, APHIS heard several key messages pertaining to the 2015 response, all supporting the need for more rapid, streamlined actions.

In addition to hearing stakeholder concerns, APHIS also used scientific and economic data to create a disease transmission model that estimated the impacts of different response strategies for a widespread outbreak involving multiple States and production sectors. The results showed that strategies that target multiple aspects of the disease control process—depopulation, disposal, detection, and prevention—had the greatest impact on reducing outbreak size and duration. If depopulation and disposal capacities are at maximal speed and efficiency, combined with improved detection and biosecurity in each of the poultry sectors, producer losses could decrease by 37 percent compared to the base outbreak, and indemnity costs decrease by 78 percent.

Links to supporting documents:

- Avian Influenza Outbreak…Lessons Learned Conference , July 28-29, Des Moines, IA
- Modeling Alternative Control Strategies for HPAI in the Fall of 2015

2. We have increased the speed of detection of affected premises.

At the start of the current HPAI event, APHIS required confirmation by APHIS' National Veterinary Services Laboratories (NVSL) to trigger HPAI response actions. Later, we adjusted the policy to allow for depopulation of a flock based upon a positive result in a NAHLN lab after an initial case within the State had been confirmed by APHIS.

For the fall, APHIS will initiate depopulation actions based upon the preliminary diagnosis by a NAHLN lab for any HPAI case, including the first case in a new State. We will also allow the use of a rapid on-farm HPAI test by industry officials for testing samples from sick or dead birds. Positive on-farm results will be deemed "suspect cases" and can be used to initiate quarantine and rapid depopulation if Federal and State officials concur. All preliminary NAHLN results and suspect on-farm results will be confirmed at NVSL.

Links to supporting documents:

- Use of the Antigen Capture Immunoassay (ACIA)

3. We are prepared to depopulate all affected flocks within 24 hours of preliminary diagnosis.

Rapid depopulation is necessary both to control disease spread—thus safeguarding other flocks—and to spare birds from suffering death by HPAI, which can have a mortality rate of 100%. Based on scientific data, APHIS, States, and industry agree that depopulation within 24 hours of an HPAI diagnosis is optimal to reduce the risk of disease spread. Standard methods (foaming, CO_2) are preferred, as they are the most humane and effective methods to depopulate large poultry flocks. Our assessment of available resources (discussed in Section II) will help us deploy the equipment needed for these methods as efficiently as possible if HPAI returns in the fall or winter.

However, if standard methods cannot achieve the 24-hour goal, the APHIS National Incident Commander will approve—on a case-by-case basis—the use of ventilation shutdown for depopulation. While not a preferred method, it could save the lives of thousands of birds by reducing the risk of disease spread. Ventilation shutdown requires no specialized equipment or personnel, and can be implemented immediately upon recommendation by Federal, State and industry participants at the affected flock to the National Incident Commander that all other options have been considered and that no other option will achieve the 24 hour depopulation goal.

Links to supporting documents:

- APHIS Stamping-Out & Depopulation Policy
- Ventilation Shutdown Evidence and Policy

4. We have refocused from cleaning and disinfection (C&D) to virus elimination in affected facilities.

Once a flock has been depopulated and the birds have been disposed, the goal is to reach a point where we have confidence that the virus has been eliminated and the facility can be restocked with minimal risk of becoming re-infected. During the spring response and summer recovery phases of the outbreak, our C&D efforts began to shift from classical wet cleaning and chemical disinfection procedures to less labor intensive and more cost effective methods. Given the variety of facilities, their conditions, and states of cleanliness encountered in the spring outbreak, our focus in future responses needs to be on the end result: ensuring HPAI viruses are eliminated from affected facilities. Taxpayers should not bear the cost of fully cleaning HPAI-affected facilities that would normally undergo cleaning and maintenance between production cycles.

Based on our experience this spring and summer, we concluded that dry cleaning and subsequent heating of the affected facility is an efficient and cost effective method of virus elimination. We determined that heating a facility to 100-120 degrees F for seven days, with at least three of those days being consecutive, is adequate to eliminate HPAI. APHIS is drafting more guidelines for using this method. There may be other effective options, including chlorine dioxide gas disinfection, that in some cases may be cost-effective and preferable for some producers. APHIS is summarizing scientific data and literature to help inform producers to make the best choice for themselves.

Links to supporting documents:

- Cleaning and Disinfection Basics (Virus Elimination)
- Reduction of Infectious HPAI Virus

5. We are streamlining the payment of indemnity, disposal and virus elimination costs.

An indemnity program is an important tool to encourage producers to report sick animals. APHIS pays 100% of fair market value for birds indemnified due to HPAI. The calculator APHIS uses to determine that value is updated regularly, based on current market prices, and APHIS has discussed the calculator with various industry sectors over the course of the current outbreak. Recent discussions with representatives from the egg layer industry resulted in a change to our calculator to make it more reflective of current industry standards for the productive lifespan of layers. We will continue to engage all sectors of the poultry industry to assure a transparent understanding of the assumptions and data used within the APHIS indemnity calculators.

Indemnity is based on a flock inventory that is conducted as soon as a suspect flock is identified, or a foreign animal disease investigation is started, or presumptive positive result is obtained from a NAHLN laboratory. Depopulation may occur once the owner signs the indemnity agreement (VS-1-23 or other acceptable document) and transmits it to APHIS, and with the approval of both APHIS and the State Animal Health Official. Previously a flock plan was additionally required before APHIS could process indemnity payments; APHIS now requires the flock plan later in the process. This will contribute significantly toward achieving the goal of 24-hour depopulation.

APHIS regulations for HPAI response currently do not allow for splitting indemnity payments between owners and growers in the case of contract growers. APHIS is drafting an interim rule to allow the use of split owner/grower indemnity distribution for HPAI, similar to that described in the low pathogenicity AI regulations.

Bird disposal on a given premises is influenced by the type of operation, the local environmental regulations, site-specific environment, and the landowner's preferences. APHIS will continue to lead discussions and develop processes to ensure the birds, and therefore the virus, are properly disposed of in a fashion which minimizes the potential to spread the virus. APHIS has improved our capacity for timely risk-based disposal (see Section II), and we continue to explore other options. Many affected producers have asked APHIS to manage disposal on their behalf. In these cases, we use various APHIS contracts to maximize the speed of disposal. We have implemented several steps to strengthen our oversight of these contracts including providing training to ensure there is an on-site Contracting Officer's Representative/Contracting Officer's Technical Representative to oversee the contracts locally during a response.

The process for calculating and reimbursement of C&D costs has been especially difficult over the course of the 2015 HPAI outbreak. Layer facilities, where birds are in cages, proved substantially more costly to clean as compared to floor-raised operations. Facilities that were in poor condition or that had no routine maintenance were very challenging, and in some cases put personnel at risk. Costs were hard to approximate, leading to delays in C&D payments while costs were negotiated and resulting in APHIS spending far beyond initial estimates.

APHIS will fund the costs producers incur for virus elimination based on a flat rate. That rate will be based on the average cost for dry cleaning and heat virus elimination for like facilities (i.e., there will be different rates for egg laying facilities, broiler facilities, and turkey facilities). Producers may choose the method that works best for them and may use the funds for more extensive cleaning and disinfection work within the flat rate reimbursement. However, APHIS will not provide any funding for facilities that choose to remain fallow as a method of virus elimination since the producer does not incur out of pocket costs in that scenario.

Using a flat rate will reduce and standardize APHIS costs while eliminating the lengthy negotiation time currently seen with cooperative compliance agreement development. Industry participants at the "Lessons Learned" conference in Des Moines supported a flat rate approach for paying C&D costs. Producers will have the option to conduct alternate or more extensive C&D activities if necessary or if they so choose, based on the site-specific conditions of their facility. However, APHIS will reimburse the producer at the standard rate in these cases.

Direct and early payment of indemnity and a standard amount for virus elimination activities will give producers the resources and responsibility to conduct the dry cleaning/heating procedures themselves or to directly retain and oversee contractors to do the work. APHIS will publish a list of acceptable contractors at the time of a future outbreak, but producers would not be limited to these. After the producer completes the dry cleaning step, VS will inspect the facility and approve it for heating. This approach will accelerate the ability of producers to bring their facility to a condition ready for restocking.

Links to supporting documents:

- Overview of the Indemnity Calculator
- Appraisal & Indemnity Procedures
- HPAI Virus Elimination: Flat Rate Payments

6. We have developed other HPAI-related policies.

During the 2015 outbreak, APHIS developed policies for restocking previously affected premises; these are still in effect. In addition to the policies related to indemnity, depopulation, and C&D we described previously, APHIS identified other policy gaps and is taking action to fill them. We are drafting plans to respond to cases of HPAI should they be identified in swine and in the live bird marketing system (LBMS). We are reviewing our coordination with the Food Safety Inspection Service (FSIS) in case of FSIS-inspected establishments in an infected zone and/or control area and when clinically affected poultry are identified at slaughter establishments or in transit.

Links to supporting documents:

- Timeline, Eligibility, and Approval for Restocking
- Post C&D Environmental Sampling Guide
- Handling of HPAI Detections in the LBMS

7. We have revised surveillance plans for control zones.

APHIS has a robust surveillance system for avian influenza through the National Poultry Improvement Plan (NPIP), the LBMS Program Standards, and passive surveillance nationwide. For the fall, APHIS has reviewed and improved its procedures for conducting surveillance in the area surrounding affected farms, known as the control zone.

This review evaluated all HPAI outbreak surveillance protocols for control area and surveillance zones, with an aim to improve system efficiency and efficacy. Some of the changes include 1) a reduction of routine testing in backyard premises until immediately before lifting the quarantine in the control zone, and 2) a standardized approach to surveillance data entry by all incident management teams. We continue to rely on robust NPIP, LBMS, wild bird, and passive surveillance activities for national notifiable avian influenza surveillance outside of these zones.

Links to supporting documents:

- Surveillance Around HPAI Infected Backyard Flocks

IV. Preparing for the potential use of AI vaccines

Of all the aspects of the response to HPAI, vaccination is likely the most complex. The United States did not have a stockpile of AI vaccine at the start of the current detections; inventories of AI vaccine are fairly limited because poultry are not routinely vaccinated for HPAI in the United States, and any vaccine produced here is primarily for the international market.

On June 3, USDA issued a determination that we were not incorporating vaccination into our HPAI response activities at that time, citing the lack of an AI vaccine that is well matched to the current outbreak virus and the possible negative impact on international trade. USDA also indicated that we would reassess the vaccine question following further development of more effective vaccines.

1. We are preparing to be able to deploy avian influenza (AI) vaccines.

Ideally, an AI vaccine, used alone or as a booster, would be closely matched to the current field HPAI strains, provide protection against clinical signs of disease, and significantly reduce virus shedding from infected birds. Since AI vaccines do not fully prevent HPAI infection, the reduction of virus shedding is critical to interrupting the spread of infection within a population.

To encourage private sector manufacturers to develop AI vaccines that could be ready this fall or winter, APHIS has published two requests for proposals (RFP) on August 17 and November 20. The RFP enables USDA to purchase vaccine to use in response to the outbreak or stockpile for future needs—either option will provide financial incentive for manufacturers. To date, USDA has awarded two contracts to purchase vaccines for stockpiling. Multiple AI vaccines are either currently licensed or under development. For those under development, USDA is working closely with the manufacturers to expedite the review and approval of their products to ensure that they are available for use as quickly as possible.

We intend to use AI vaccines as a possible adjunct to, and not a replacement for, a future eradication effort. A decision to deploy vaccines in the face of an outbreak will need to consider the extent or expanding nature of the outbreak, including an assessment of whether response measures are containing the disease; the sector or sectors of the poultry industry affected; and the potential impact (positive and negative) of both the outbreak and the use of vaccine on domestic and international supplies and markets. If the decision is made to vaccinate for HPAI to support a future eradication effort, USDA would provide doses from the stockpile for the initial response. If the response is prolonged, we would need to re-evaluate our overall response strategy, including vaccination strategy.

The strategy for vaccination would be a suppressive emergency approach, where commercial poultry in a defined geographic area with rapidly spreading disease would be vaccinated. In addition, State Veterinarians will need to approve vaccine use within their States, following USDA guidelines. We have developed a draft vaccine use policy and are engaging States and the industry in discussions on the specifics of vaccine deployment in the field.

Links to supporting documents:

- June 3 Stakeholder announcement
- RFP solicitation

- Policy and Approach to HPAI Vaccination
- Vaccination Technical Document

Conclusion

HPAI response planning is a dynamic process. Much work has been done by APHIS and all our stakeholders to be as prepared as possible should HPAI outbreaks reoccur in poultry in 2016 or beyond. APHIS will continue to examine our preparedness posture and to make constant improvements. We invite any and all comments on this document, on our HPAI Red Book, and any of our published response policies. We also encourage all our stakeholders to continue to evaluate and improve their preparedness and response activities.