



HIGHLY PATHOGENIC AVIAN INFLUENZA RESPONSE PLAN

THE RED BOOK

FAD PReP

**Foreign Animal Disease
Preparedness & Response Plan**



**United States
Department of
Agriculture**

United States Department of Agriculture • Animal and Plant Health Inspection Service • Veterinary Services

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USDA APHIS, Veterinary Services
National Preparedness and Incident Coordination Center (NPIC)

Between December 2014 and June 2015, the United States experienced its worst highly pathogenic avian influenza (HPAI) outbreak—and most serious animal health disease incident—in history. This version of the *USDA APHIS HPAI Response Plan: The Red Book (Draft August 2015)* reflects the knowledge and lessons learned during this event. Additionally, this version incorporates comments received on prior versions of the plan (2011 and 2012), as well as changes to related Foreign Animal Disease Preparedness and Response Plan (FAD PReP) materials.

The following list highlights important changes that were made to this Draft 2015 version of this *HPAI Response Plan*.

- Reflects the 2015 OIE *Terrestrial Animal Health Code*.
- Clarifies HPAI virus information, based on the 2014–2015 outbreak.
- Incorporates policy guidance from the 2014–2015 outbreak.
- Reflects changes to the National Response Framework (Chapter 2).
- Ensures consistency with other response plans and strategic documents.
- Addresses recent comments made on the plan, including those comments received on the *HPAI Response Plan: The Red Book (September 2012)* version that was circulated.
- Updates the HPAI Case Definition (Chapter 5).
- Updates the diagnostic flow charts and associated diagnostics section based on current laboratory and response diagnostic processes and procedures (Chapter 5).
- Clarifies vaccination and appraisal sections (Chapter 5).
- Updates information on recovering from an HPAI outbreak (Chapter 6).
- Provides new epidemiological questionnaires from 2014–2015 outbreak.

We realize that preparing for and responding to an HPAI outbreak remains a complex effort, requiring collaboration from all levels of government and industry stakeholders. We will accept comments on the *HPAI Response Plan* for incorporation into future versions. Ongoing HPAI events will dictate when the next version of this response plan will be released and the extent of the changes required.

Please email all comments to FAD.PReP.Comments@aphis.usda.gov with the subject line of “Comments to HPAI Response Plan.” **For inclusion in the next version, comments must be received no later than October 1, 2015.**

The Foreign Animal Disease Preparedness and Response Plan (FAD PReP) mission is to raise awareness, define expectations, and improve capabilities for FAD preparedness and response.

For more information, please go to:
<http://www.aphis.usda.gov/fadprep>
<http://inside.aphis.usda.gov/vs/em/fadprep.shtml> (APHIS employees)
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Executive Summary

This *Highly Pathogenic Avian Influenza (HPAI) Response Plan: The Red Book (Draft August 2015)* incorporates guidance developed during the 2014–2015 HPAI outbreak in the United States, as well as comments received on the last version of the *HPAI Response Plan* and updates to other Foreign Animal Disease Preparedness and Response (FAD PRoP) materials. The 2014–2015 outbreak was the largest animal health incident in U.S. history; this plan strives to reflect the important lessons learned from this incident.

The objectives of this plan are to identify (1) the capabilities needed to respond to an HPAI outbreak and (2) the critical activities that are involved in responding to that outbreak, and time-frames for these activities. These critical activities are the responsibility of Incident Command in an outbreak situation. This plan protects public health and the environment, promotes agricultural security, secures the food supply, and guards animal health and animal agriculture by providing strategic guidance on responding to an HPAI outbreak. Developed by the National Preparedness and Incident Coordination Center in Surveillance, Preparedness, and Response Services, this plan gives direction to emergency responders at the Federal, State, Tribal, local, and industry levels to facilitate HPAI control and eradication efforts in poultry in the United States. This plan complements, not replaces, existing regional, State, Tribal, local, and industry plans.

HPAI is zoonotic, and while it appears to have a relatively high species-specific transmission barrier, it also can be fatal for humans. Animal health officials coordinate with public health officials in the event that HPAI is identified in the United States; appropriate health and safety measures should always be observed when conducting HPAI response activities.

The HPAI virus is highly contagious and causes extremely high morbidity and mortality rates in poultry. During the 2014–2015 outbreak, HPAI H5N2 rapidly spread to over 200 commercial premises in the Midwest, where the focal point of the outbreak was Iowa and Minnesota. Turkeys and layer-type chickens were heavily affected: for example, approximately 10 percent of the annual average U.S. layer inventory was depopulated. To-date, over \$600 million dollars has been spent on response activities and indemnity.

HPAI is easily spread through direct contact with sick or infected poultry, as well as via fomites, such as equipment and vehicles. An HPAI outbreak in the United States results in major economic consequences: in the 2014–2015 outbreak, according to current estimates (which are subject to modification), net losses could exceed \$1 billion for feed and livestock producers. While the current circulating HPAI strains do not appear to be zoonotic, there is also the significant

social and psychological impact on flock owners and responders from response activities.

The goals of an HPAI response are to (1) detect, control, and contain HPAI in poultry as quickly as possible; (2) eradicate HPAI using strategies that seek to protect public health and the environment, and stabilize animal agriculture, the food supply, and the economy; and (3) provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products. Achieving these three goals will allow individual poultry facilities, States, Tribes, regions, and industries to resume normal production as rapidly as possible. The objective is to allow the United States to regain disease-free status without the response effort causing more disruption and damage than the disease outbreak itself.

The United States' primary control and eradication strategy for HPAI in domestic poultry, as recommended by the World Organization for Animal Health (OIE), is "stamping-out."

During an HPAI outbreak response, many activities—such as epidemiology, surveillance, biosecurity, quarantine and movement control, and depopulation—must occur in a deliberate, coordinated fashion. In particular, rapid depopulation of infected poultry is critical to halt virus transmission and must be prioritized. In addition to providing strategic direction on these various activities, this plan explains the underlying Incident Command System structure, applying the National Response Framework (NRF) and National Incident Management System (NIMS) principles and systems to control and eradicate an outbreak of HPAI in the domestic poultry population.

Incorporating current scientific knowledge and policy guidance about HPAI, the *HPAI Response Plan*

- ◆ identifies the audience for and purpose of the document;
- ◆ provides technical information on HPAI and the impact an HPAI outbreak can have in the United States;
- ◆ explains the integration of the NRF, NIMS, and the other FAD PReP documents;
- ◆ describes U.S. Department of Agriculture preparedness and response activities, both domestic and international, including collaboration with public health agencies and APHIS Incident Management;
- ◆ presents information on 23 specific response critical activities and tools, such as surveillance, diagnostics, cleaning and disinfection, health and safety, personal protective equipment, and depopulation;

- ◆ details OIE standards for HPAI surveillance, virus inactivation, and disease freedom; and
- ◆ supplies information on proof-of-freedom procedures and restocking after an HPAI outbreak.

This response plan is carefully integrated with other FAD PReP documents, including the HPAI Standard Operating Procedures and National Animal Health Emergency Management System Guidelines. Together, these documents provide a comprehensive preparedness and response framework for an HPAI outbreak. Please visit the FAD PReP website, which promotes preparedness relationships and advances response capabilities. The website is at: www.aphis.usda.gov/fadprep. Public health information about avian influenza and humans can be found at <http://www.cdc.gov/flu/avianflu>.

This plan is a dynamic document that will be updated and revised based on future knowledge and further stakeholder input. Your comments and recommendations on this document are invited. Please send them to: FAD.PReP.Comments@aphis.usda.gov.

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Preface

The Foreign Animal Disease Preparedness and Response Plan (FAD PReP)—*Highly Pathogenic Avian Influenza (HPAI) Response Plan: The Red Book (Draft August 2015)* provides strategic guidance for responding to an animal health emergency caused by HPAI in the United States. This *HPAI Response Plan (Draft August 2015)* updates the *HPAI Response Plan (2012)* and replaces previous versions of HPAI summary response plans. Information in this plan may require further discussion and development with stakeholders.

This *HPAI Response Plan* is under ongoing review. This document was last updated in **August 2015**. Please send questions or comments to:

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Chapter 1

Introduction and HPAI Information

1.1 INTRODUCTION TO RESPONSE PLAN

This draft version of the *Highly Pathogenic Avian Influenza (HPAI) Response Plan: The Red Book (2015)* has been updated to reflect the 2014–2015 HPAI outbreak in the United States. It also incorporates comments received to prior versions (2011 and 2012) and updates to other Foreign Animal Disease Preparedness and Response (FAD PRoP) materials.

The objectives of this plan are to identify the (1) capabilities needed to respond to an HPAI outbreak in poultry and (2) critical activities that are involved in responding to that outbreak and the time-frames for these activities. In an outbreak situation, these critical activities are under the authority of an Incident Command (IC) per the National Incident Management System (NIMS).

This *HPAI Response Plan* provides current information on HPAI and presents an overview of the organizational strategy for an effective response to a detection of HPAI in poultry. In addition, it offers guidance on stamping-out, the primary HPAI outbreak response strategy. This plan also contains guidance for conducting critical response activities, which include biosecurity, mass depopulation, disposal, and appraisal and compensation.

1.2 AUDIENCE AND PURPOSE OF DOCUMENT

This plan provides strategic guidance for the U.S. Department of Agriculture (USDA) and the Animal and Plant Health Inspection Service (APHIS) and responders at all levels in the event of an HPAI outbreak. It also provides current policy information and a strategic framework for the control and eradication of HPAI, should an outbreak occur in the United States. It offers additional resources for tactical information for responders (Federal, State, Tribal, local, and industry) who act during an HPAI outbreak in poultry.

This plan does not replace existing regional, State, Tribal, local, or industry preparedness and response plans relating to HPAI. Regional, State, Tribal, local, and industry plans should be aimed at more specific issues in an HPAI response. In particular, States should develop response plans focused on the specific characteristics of the State and its poultry industry. Industry should develop response plans focused on the specific characteristics of their commercial operations and business practices.

As indicated by links throughout the document, this plan is integrated and coordinated with other FAD PReP documents such as HPAI standard operating procedures (SOPs), National Animal Health Emergency Management System (NAHEMS) Guidelines, and existing APHIS policy guidance. ([Appendix A](#) provides a list of documents related to HPAI outbreak response and an overview of FAD PReP.)

1.3 SCOPE OF RESPONSE PLAN

Avian influenza (AI) is primarily an infection of birds. While other species are susceptible (for a list see [Section 1.6.6](#) of this plan), this plan is focused on poultry.¹ However, if susceptible animals other than poultry become significant to the response effort, the case and laboratory definitions will be adapted by the IC to fit the prevailing epidemiological findings during an outbreak. This is further discussed in [Chapter 4](#).

The plan does not address control and eradication of low pathogenicity avian influenza (LPAI) in poultry. However, LPAI is addressed comprehensively in the USDA-APHIS *National Poultry Improvement Plan (NPIP)*: www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/.

1.4 FALL 2015 PREPAREDNESS PLANNING

There has been a tremendous amount of preparedness planning for the fall of 2015. Finding improved ways to control and contain the virus is a priority. As specified in the *Fall 2015 HPAI Preparedness Plan*—presented to the Secretary of Agriculture—increasing the speed of detection and depopulation, revisiting the best ways to eliminating the virus, streamlining indemnity payments, and improving documentation of biosecurity measures are key areas of focus now and in the immediate future. Though the guidance provided in this *HPAI Response Plan* is not highly specific, the information provided within this plan remains consistent with the intent of and activities pursuant to these initiatives.

1.5 CURRENT SITUATION

HPAI remains a high-priority concern for USDA APHIS. Caused by influenza virus A, AI viruses are classified as either highly pathogenic (HPAI) or low pathogenicity (LPAI), depending on the genetic features of the virus and the severity of disease produced in poultry. Most AI viruses are LPAI and do not result in high mortality in wild birds or domestic poultry. However, HPAI can be

¹ For this *HPAI Response Plan*, poultry is defined as: chickens, and any of the following birds, if these other birds are kept, raised, captured, bred, or otherwise used for a commercial purpose: turkeys, ducks, geese, swans, pheasants, partridges, grouse, quail, guinea fowl, pea fowl, pigeons, doves, ostriches, emus, rheas, cassowaries. Commercial purposes include the production or sale of birds, or of their meat, eggs, or feathers. Does not include chickens or other birds displayed in a licensed exhibition or zoo.

associated with morbidity and mortality rates of up to 100 percent: the 2014–2015 outbreak resulted in the loss of nearly 50 million birds.

Reservoirs of LPAI virus exist worldwide in wild bird populations. The transmission of LPAI virus from reservoirs to susceptible species—typically poultry—can result in strain mutation or reassortment to an HPAI virus (through antigenic shift or antigenic drift). While historically HPAI viruses have not established endemic infection status in the poultry populations of countries that have developed veterinary infrastructure, the spread of HPAI in the United States during the recent outbreak shows the critical threat that HPAI poses to animal health and agriculture.

In the 2014–2015 HPAI outbreak in the United States, H5N2 was the most common subtype of HPAI followed by H5N8. Neither of these strains was detected in humans, including those persons responding to the incident. However, it is worth acknowledging that there are HPAI strains circulating in poultry that are of significant concern to public health, such as H5N1² and H5N6. The majority of these infections have been detected in Asia, though there have been human cases identified around the world. While human infections remain relatively uncommon due to an apparently high species-specific transmission barrier, mortality rates can be high. Current evidence suggests that very close contact with dead, sick, and infected birds is the primary mode of human infection.³ Therefore, it is critically important for agriculture and public health agencies to coordinate efforts in any response to HPAI.

1.6 HPAI INFORMATION

The following sections provide an overview of HPAI and cover the following subjects:

- ◆ Etiology
- ◆ History and global distribution
- ◆ HPAI in the United States
- ◆ International Trade
- ◆ Impact of an HPAI outbreak
- ◆ Ecology

² There was an H5N1 virus detected in the State of Washington during the recent outbreak, but this strain was genetically distinct and is *not* the same strain causing human illness and death in Asia and Africa.

³ Centers for Disease Control and Prevention (CDC) (2015). HPAI A H5 Virus Background and Clinical Illness. Accessed from www.cdc.gov/flu/avianflu/hpai/hpai-background-clinical-illness.htm (July 14, 2015).

-
- ◆ Diagnosis in avian species
 - ◆ Immunity.

The USDA AI website also contains valuable information: www.usda.gov/birdflu. Further information on HPAI can be found in the HPAI Overview of Etiology and Ecology SOP. [Chapter 5](#) of this plan includes a current case definition for H5/H7 AI.

1.6.1 Etiology

1.6.1.1 OVERVIEW

AI, also known as fowl plague, is caused by *Influenzavirus A*, which is in the family Orthomyxoviridae. Influenza A viruses are further classified by their surface glycoproteins, hemagglutinin (H or HA) and neuraminidase (N or NA). Sixteen H (H1 to H16) subtypes and nine N (N1 to N9) subtypes of influenza A have been identified.

1.6.1.2 WORLD ORGANIZATION FOR ANIMAL HEALTH (OIE) INFECTION WITH AVIAN INFLUENZA VIRUSES⁴

In the *Terrestrial Animal Health Code (2015)*, the OIE defines infection with avian influenza as follows:

1. For the purposes of the Terrestrial Code, avian influenza is defined as an infection of poultry caused by any influenza A virus of the H5 or H7 subtypes or by any influenza A virus with an intravenous pathogenicity index (IVPI) greater than 1.2 (or as an alternative at least 75% mortality) as described below. These viruses are divided into high pathogenicity avian influenza viruses and low pathogenicity avian influenza viruses:

⁴ The OIE defines poultry as all domesticated birds, including backyard poultry, used for the production of meat or eggs for consumption, for the production of other commercial products, for restocking supplies of game, or for breeding these categories of birds, as well as fighting cocks used for any purpose.

Birds that are kept in captivity for any reason other than those reasons referred to in the preceding paragraph, including those that are kept for shows, races, exhibitions, competitions or for breeding or selling these categories of birds as well as pet birds, are not considered to be poultry.

- a. High pathogenicity avian influenza viruses have an IVPI in six-week-old chickens greater than 1.2 or, as an alternative, cause at least 75% mortality in four-to eight-week-old chickens infected intravenously. H5 and H7 viruses which do not have an IVPI of greater than 1.2 or cause less than 75% mortality in an intravenous lethality test should be sequenced to determine whether multiple basic amino acids are present at the cleavage site of the haemagglutinin molecule (HA0); if the amino acid motif is similar to that observed for other high pathogenicity avian influenza isolates, the isolate being tested should be considered as highly pathogenicity avian influenza virus;
 - b. Low pathogenicity avian influenza viruses are all influenza A viruses of H5 and H7 subtypes that are not high pathogenicity avian influenza viruses.
2. The following defines the occurrence of infection with an avian influenza virus: the virus has been isolated and identified as such or specific viral ribonucleic acid has been detected in poultry or a product derived from poultry.

1.6.1.3 U.S. CODE OF FEDERAL REGULATIONS DEFINITIONS OF AI⁵

In 9 Code of Federal Regulation (CFR) 53, HPAI is defined as:

- (1) Any influenza virus that kills at least 75 percent of eight 4- to 6-week-old susceptible chickens within 10 days following intravenous inoculation with 0.2 ml of a 1:10 dilution of a bacteria-free, infections allantoic fluid;
- (2) Any H5 or H7 virus that does not meet the criteria in paragraph (1) of this definition, but has an amino acid sequence at the hemagglutinin cleavage site that is compatible with highly pathogenic avian influenza viruses; or
- (3) Any influenza virus that is not an H5 or H7 subtype and that kills one to five chickens and grows in cell culture in the absence of trypsin.

1.6.2 History and Global Distribution

AI was first reported in Italy and described as a serious disease of poultry in 1878. An influenza A virus was identified as the causative agent of fowl plague in 1955. AI viruses, including HPAI, are found in most countries of the world where poultry is produced. The worldwide prevalence of AI viruses is influenced by the distribution of both domestic and wild avian species, locality of poultry production, migratory routes, and season. Accurate prevalence rates of infection

⁵ Please see the appropriate CFR sections for further information, such as CFR definitions of poultry.

are difficult to determine—particularly for LPAI—because international surveillance systems and procedures used to identify and track AI vary.

Sporadic and infrequent outbreaks of HPAI in domestic poultry occur worldwide, and outbreaks have been documented in many countries throughout the world. According to reports made to the OIE since 2010, HPAI has been detected in Australia, Bangladesh, Bhutan, Bulgaria, Cambodia, Canada, China, Egypt, Germany, Hong Kong, India, Indonesia, Iran, Israel, Japan, North Korea, South Korea, Laos, Mexico, Mongolia, Myanmar, Nepal, Netherlands, Nigeria, Pakistan, Romania, Russia, Spain, South Africa, Taiwan, United Kingdom, United States, and Vietnam. In some countries, such as China, Egypt, Indonesia, and Vietnam, HPAI is considered endemic.

Between 2013–2015, HPAI outbreaks have occurred in the United States (H5N2 and H5N8), Canada (H5N2), Mexico (H7N3), Italy (H7N7), South Korea (H5N8), Japan (H5N8), and Germany/Netherlands (H5N8). HPAI H5N1 and H5N6 continue to cause not only infections in poultry, but human disease in a number of countries, including Egypt, Cambodia, Indonesia, Vietnam, and China.

1.6.3 HPAI in the United States

1.6.3.1 HISTORICAL

LPAI viruses are present in wild birds and are periodically detected in domestic poultry flocks in the United States. In addition, the United States experienced HPAI outbreaks in 1924, 1983, 2004, and 2014–2015. No significant human illness has been reported from any of these HPAI outbreaks.

The 1983 and 2004 outbreaks were linked to the live bird marketing system (LBMS) via epidemiological investigation. By contrast, scientists believe the initial introduction of HPAI in 2014 was from wild birds into poultry flocks.

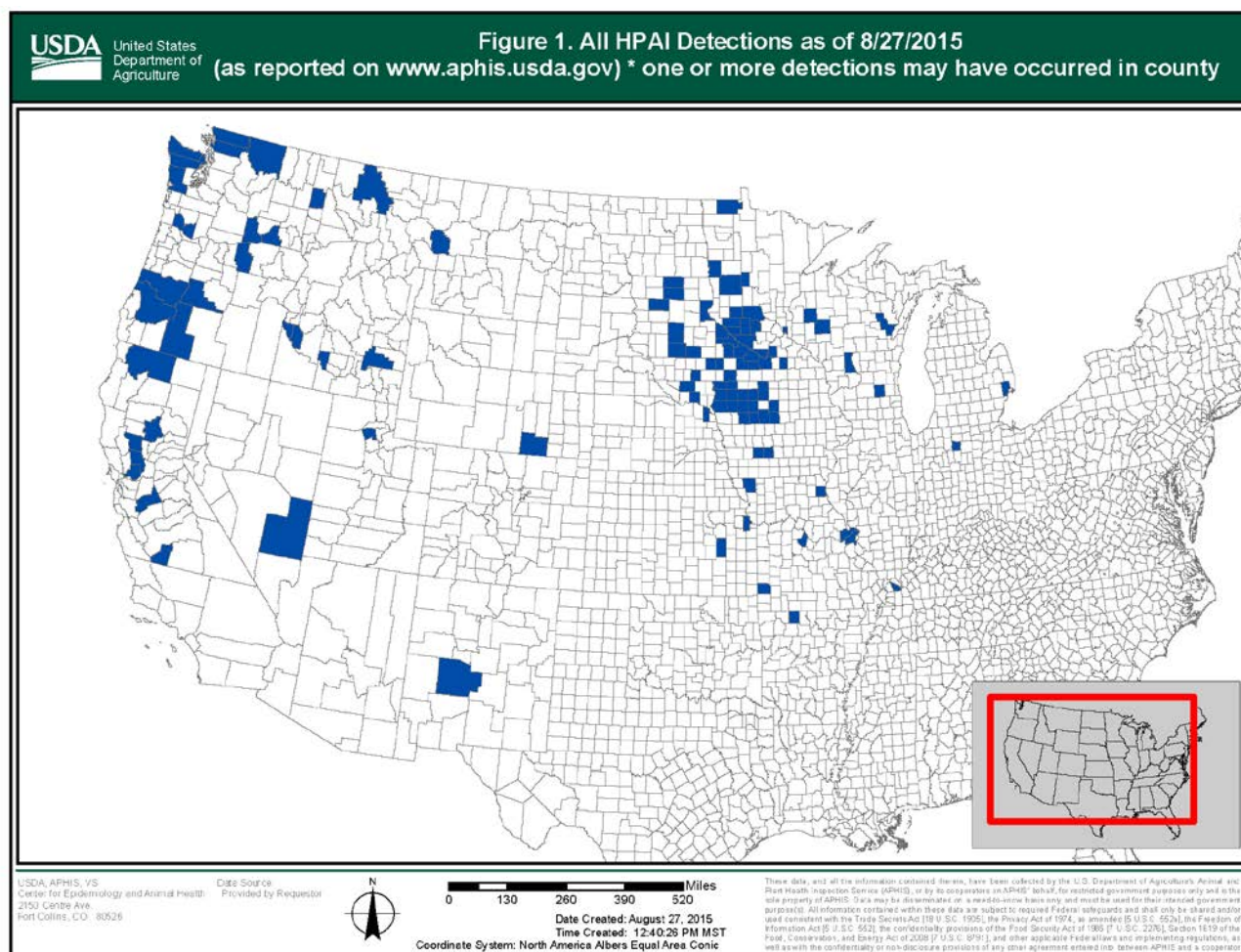
1.6.3.2 2014–2015 OUTBREAK

The 2014–2015 outbreak is the largest ever in the United States, resulting in 49.6 million affected birds by the time the outbreak lulled in the summer of 2015. New detections spanned from December 2014 to June 2015. As of August 2015, the depopulation losses represent 7.46 percent of average U.S. turkey inventory, 10.01 percent of the average layer inventory, and 6.33 percent of average U.S. pullet inventory. Broilers were mainly unaffected during the outbreak.

The hardest hit States were Minnesota (over 100 affected premises) and Iowa (over 70 affected premises); the States of South Dakota, Wisconsin, Nebraska, California, Missouri, North Dakota, and Arkansas also had one or more detections of HPAI in commercial flocks.

Figure 1-1 illustrates the detections of HPAI in the United States, and includes detections in wild birds, captive wild birds, backyard flocks, and commercial operations. In all, 21 States had a detection of HPAI.

Figure 1-1. HPAI in the United States 2014–2015; Detections in All Birds



Though the initial introduction is believed to be from migratory wild birds, the virus eventually spread through other means as well. While it is difficult to identify a single pathway, known and predictable routes of disease spread have been implicated. These include breakdowns in farm biosecurity, rodents and small birds inside poultry houses, sharing of equipment, and the movement of employees and other personnel. It is also possible that wind aided in the transmission of HPAI over short distances.

Industry, academic, and USDA APHIS scientists and veterinarians are preparing for a resurgence of HPAI in the fall of 2015, as temperatures cool and migratory routes become highly active.

1.6.4 International Trade

The United States does not import live poultry from countries or regions currently experiencing HPAI outbreaks in commercial or backyard poultry flocks. However, USDA APHIS may recognize HPAI-free regions (also called zones) for trade in countries affected by HPAI that demonstrate adequate veterinary infrastructure and authority, movement, disease control measures, and surveillance activities for HPAI. Countries and regions that are recognized, per 9 CFR, Part 94.6, by the United States as *affected* with HPAI are listed [here](#).

Just as the United States bans imports from HPAI affected countries and regions, in the 2014–2015 HPAI outbreak in the United States, many countries placed restrictions on exported U.S. poultry and poultry products. While some countries placed bans only on a specific region, county, or State, other countries did ban poultry and poultry products from the entire United States. These bans have a significant economic impact.

1.6.5 Impact of an HPAI Outbreak

1.6.5.1 ECONOMIC

A widespread HPAI outbreak can have a substantial economic impact, as clearly demonstrated in the 2014–2015 outbreak in the United States. The 1983–1984 HPAI outbreak in the northeastern United States resulted in the destruction of more than 17 million birds at a cost of approximately \$65 million. The retail price of eggs jumped nearly 30 percent. A 2004 outbreak of H7N3 in Canada resulted in C\$360 million in gross economic losses.⁶

To-date, the USDA has spent over \$600 million dollars controlling and containing the 2014–2015 outbreak, including funds spent on indemnity payments. According to current estimates (which are subject to modification), net losses could exceed \$1 billion for feed and livestock producers. In part, this is a consequence of partial or full trade embargoes from over 30 countries; there was an reported decline in poultry exports of 14 percent from January to June 2015.⁷ The price for farm-level eggs surged 35.4 percent in 1 month due to the outbreak, and prices are forecasted to remain high for the rest of 2015.⁸

1.6.5.2 ZOONOTIC POTENTIAL AND PUBLIC HEALTH IMPLICATIONS

HPAI can have significant public health implications. HPAI is zoonotic, and although it appears to have a relatively high species-specific transmission barrier,

⁶ Swayne, DE, “High Pathogenicity Avian Influenza in the Americas,” in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

⁷ U.S. Poultry & Egg Export Council. “Exports for First Half of 2015 Decline by 14%,” August 10, 2015. Accessed from www.usapeec.org.

⁸ Economic Research Service (ERS), “Price Food Outlook, 2015” June 24, 2015. Accessed from www.ers.usda.gov/data-products/food-price-outlook/summary-findings.aspx.

under certain circumstances, specific strains of HPAI have been demonstrated to infect and be fatal to humans.⁹ For example, as of June 23, 2015, there have been 842 cases and 447 deaths of laboratory-confirmed HPAI H5N1 reported to the World Health Organization (WHO).¹⁰ The HPAI H5N6 and H7N7 viruses have also infected humans. Public health officials and animal health officials vigilantly monitor AI because of the unique ability of influenza A viruses to genetically reassort to more pathogenic—and possibly mammalian—strains. Fortunately, rates of HPAI infections in humans remain relatively low.

1.6.6 Ecology

Many avian species are susceptible to infection with HPAI viruses, including but not limited to

- ◆ chickens,
- ◆ turkeys,
- ◆ ducks,
- ◆ geese,
- ◆ guinea fowl, and
- ◆ a wide variety of other birds, including migratory waterfowl and shorebirds.

Psittacine birds (such as parrots and cockatiels) are more rarely affected. Mammalian hosts, including swine and humans, may be vulnerable to infection by some AI strains, particularly the H5, H7, and H9 subtypes.

1.6.6.1 RESERVOIR

AI viruses usually infect migratory waterfowl, particularly Anseriformes (ducks and geese) and Charadriiformes (gulls and shorebirds) that can carry LPAI viruses without showing illness. Other aquatic species may also be maintenance hosts. LPAI virus strains occur worldwide and have been isolated from more than 100 different species of birds.¹¹ The wild-bird reservoir of LPAI viruses is a major potential source of infection for domestic birds, particularly free- and open-range poultry. Following transmission from wild to commercial birds, the virus can mutate or reassort in gallinaceous (e.g., chickens) poultry flocks, resulting in an

⁹ Swayne, DE and Thomas, C. “Trade and Food Safety Aspects for Avian Influenza Viruses,” in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

¹⁰ WHO, *Cumulative Number of Confirmed Cases of Avian Influenza A(H5N1) Reported to WHO, 2003–2015*. Accessed from www.who.int/influenza/human_animal_interface/EN_GIP_20150623cumulativeNumberH5N1cases.pdf?ua=1.

¹¹ Swayne, DE, “Epidemiology of Avian Influenza in Agricultural and Other Man-Made Systems,” in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

HPAI virus.¹² It remains unclear how long and to what extent wild birds can maintain HPAI viruses, though there is evidence that certain species of Anseriformes can carry and shed certain HPAI viruses without clinical signs. This poses a serious transmission risk to commercial poultry.

1.6.6.2 INTRODUCTION AND TRANSMISSION OF AI IN POULTRY

Contact with infected wild birds or their secretions is a common mode of AI introduction into a poultry population. While live poultry markets have been documented as a source of introduction and further dissemination of both LPAI and HPAI in past outbreaks both in Asia and the Americas, there is strong evidence that the 2014–2015 outbreak in the United States was introduced from wild birds to poultry flocks.

HPAI virus is transmitted via direct exposure to infected birds, feces, or secretions from infected birds. Transmission can occur through the movement of contaminated fomites, including by people, on contaminated clothing, equipment, and vehicles. Airborne transmission is not likely a primary mode of transmission, although it may occur over short distances as an aerosol via contaminated dust and debris. Especially in windy environments where there are high concentrations of virus, this mode of transmission may occur to nearby premises and houses. When a hen is infected, the HPAI virus is also likely to be present on the eggshell and internal egg contents; to-date there is no evidence demonstrating vertical transmission.¹³

1.6.6.3 PERSISTENCE IN ENVIRONMENT AND ANIMAL PRODUCTS

AI viruses are easily inactivated by heat, but may remain viable for longer in cold and humid environments. At colder temperatures, virus survival has been documented in feces from less than 4 days to at least 30–40 days in various experiments.¹⁴ Two H5N1 HPAI viruses were also shown to persist in water at cool temperatures, surviving for 94–158 days at 17°C, but not after 30 days at 28°C.¹⁵ The virus can also survive for extended periods when protected from sunlight (from 2 days to 2 weeks depending on temperatures).

AI viruses can also be isolated from animal products, including eggs.¹⁶ Therefore, the OIE recommends that all poultry meat reach a specific time/temperature for

¹² OIE, *Highly Pathogenic Avian Influenza*, Technical Disease Card, 2009, www.oie.int.

¹³ OIE, *Highly Pathogenic Avian Influenza*, Technical Disease Card, 2009, www.oie.int.

¹⁴ Center for Food Security and Public Health (CFSPH). Avian Influenza. 2014. Accessed from www.cfsph.iastate.edu/Factsheets/pdfs/highly_pathogenic_avian_influenza.pdf.

¹⁵ Swayne, DE, “Epidemiology of Avian Influenza in Agricultural and Other Man-Made Systems,” in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

¹⁶ Cappucci DT, Johnson DC, Brugh M, Smith TM, Jackson CF. 1985. “Isolation of avian influenza virus (subtype H5N2) from chicken eggs during a natural outbreak.” 29:1195-1200.

inactivation of AI; for example, a core temperature of 70°C for 3.5 seconds. Whole eggs should be heated to a core temperature of 60°C for 188 seconds.¹⁷

1.6.7 Diagnosis in Avian Species

The incubation period for HPAI viruses in naturally infected chickens ranges from 3 to 14 days.¹⁸ The OIE *Terrestrial Animal Health Code (2015)* gives the incubation period for AI infection as 21 days.¹⁹ AI may have longer incubation periods in some species than others; each HPAI virus—even those of the same subtype—may have a slightly different incubation period.

1.6.7.1 CLINICAL SIGNS

Birds affected with HPAI show a variety of clinical signs, involving the respiratory, digestive, reproductive, or nervous systems. Signs of LPAI are typically much milder.

1.6.7.1.1 Galliformes

Common clinical signs of HPAI in galliformes (such as chickens, turkeys, and guinea fowl) include

- ◆ marked depression with ruffled feathers,
- ◆ decreased feed consumption,
- ◆ excessive thirst,
- ◆ decreased or cessation of egg production,
- ◆ mild to severe respiratory distress, and
- ◆ swollen wattles and combs and watery greenish diarrhea.

Clinical signs relating to the nervous system are not frequently observed in Galliformes. However, if present, they include the inability to walk or stand and a loss of coordination.

¹⁷ OIE, Article 10.4.25 and 10.4.26 *Terrestrial Animal Health Code*, 2015, www.oie.int.

¹⁸ Swayne, DE, “Epidemiology of Avian Influenza in Agricultural and Other Man-Made Systems,” in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

¹⁹ OIE, Article 10.4.1. *Terrestrial Animal Health Code*, 2015, www.oie.int.

1.6.7.1.2 Anseriformes

Anseriformes (such as, ducks and geese) usually do not show clinical signs with infection of LPAI. While some species of these birds may also carry HPAI viruses sub-clinically, HPAI viruses can also present as the following

- ◆ sudden death;
- ◆ nervous signs (such as a lack of coordination and the inability to stand and walk); and
- ◆ dyspnea, depression, and diarrhea.

1.6.7.1.3 Other Birds

Birds from other orders may also become affected with HPAI, as demonstrated in the recent outbreak. These birds include Falconiformes (e.g., the gyrfalcon) and Strigiformes (e.g., great-horned owls). These animals can die suddenly, but may also experience symptoms (including depression, diarrhea, and decreased food consumption) and recover from the virus.

1.6.7.2 GROSS PATHOLOGICAL LESIONS

Lesions have been observed in susceptible avian species, but they are extremely variable.²⁰ Galliformes with HPAI may not have prominent lesions, except those associated with general muscular congestion and dehydration. However, a variety of edematous, hemorrhagic, and necrotic lesions in visceral organs and the skin have been reported. In Anseriformes, the following gross lesions have been reported: ocular and nasal discharge, conjunctivitis, ecchymotic or petechial hemorrhage of leg and footpad, serous fluid surrounding vital organs, and pancreatic mottling.

1.6.7.3 DIFFERENTIAL DIAGNOSES

HPAI may resemble acute fowl cholera (caused by *Pasturella* spp.), velogenic viscerotropic Newcastle disease (caused by Paramyxovirus PMV-1), intoxication (e.g., from contaminated food or water), as well as some respiratory diseases (e.g., infectious laryngotracheitis).

1.6.8 Immunity

1.6.8.1 ACTIVE

Infection with or exposure to AI viruses, as well as immunization with vaccines, stimulates an antibody response at both the systemic and mucosal levels.

²⁰ Swayne, DE, "Pathobiology of Avian Influenza Virus Infections in Birds and Mammals," in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

Immunoglobulin A is the primary antibody to mediate mucosal protection in birds; immunoglobulin G and immunoglobulin M have also been identified.²¹ The intensity of the antibody response varies with bird species.

Antibodies against the surface proteins are neutralizing and protective. Protection has been primarily associated with antibodies directed to the HA protein; however, either HA or NA antibodies, or both, prevent clinical signs and death following challenge with HPAI viruses having homologous HA or NA subtypes. The level of protection against mucosal infection and subsequent shedding of the challenge virus may depend on the degree of sequence similarity in the HA of vaccine and challenge virus. The duration of protection is variable and depends on many factors; in chicken layer flocks, protection against clinical signs and death has been demonstrated to be at least 30 weeks following a single immunization.

Immune response against internal proteins has not been shown to prevent clinical signs or death, but may shorten the period of the virus replication and consequently reduce virus shedding.

1.6.8.2 PASSIVE

Studies on protection by maternal antibodies to homologous HA or NA have not been reported. On the basis of available information on other viral avian diseases, protection against clinical signs and death from a homologous AI viral challenge is probable for the first 2 weeks after hatching. For surveillance purposes, the OIE suggests that maternal antibodies derived from a vaccinated parent flock are usually found in the yolk and can persist in progeny for up to 4 weeks.²²

1.6.8.3 VACCINATION

Vaccination against different AI virus subtypes has been used in a variety of poultry species. Vaccine has been documented to be effective in both preventing clinical signs, reducing virus shedding, and preventing mortality. The duration and level of protection provided by the vaccine is affected by many factors including the dose of the virus challenge, the type of adjuvant used, the length of protection produced, the HA match of the vaccine to the field strain, the species and age of birds vaccination, and how the vaccine is administered.²³

USDA APHIS' primary response strategy to an HPAI outbreak is stamping-out and implementing strict biosecurity measures. Emergency vaccination has not been implemented in the 2014–2015 outbreak. Under certain conditions and with

²¹ Swayne, DE, and Kapczynski, DR, "Vaccines, Vaccination, and Immunology for Avian Influenza Viruses in Poultry," in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

²² OIE, Article 10.4.29. *Terrestrial Animal Health Code*, 2015. www.oie.int.

²³ Swayne, DE, and Kapczynski, DR, "Vaccines, Vaccination, and Immunology for Avian Influenza Viruses in Poultry," in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

an appropriate vaccine product available, an emergency vaccination strategy could be considered, particularly for specific types of poultry. DIVA (differentiation of infected from vaccinated animals) testing is necessary for an effective emergency vaccination strategy. Emergency vaccination is further discussed in [Chapter 5](#).

Chapter 2

Framework for HPAI Preparedness and Response

2.1 FOUNDATION OF PREPAREDNESS AND RESPONSE

Successful emergency preparedness for and response to HPAI is based on the principles found in the National Response Framework (NRF) and NIMS. FAD PReP, including this HPAI-specific plan, provides detailed information and specific guidance on response requirements for an outbreak in the United States. FAD PReP documents are consistent with both NRF and NIMS.

2.1.1 National Response Framework

The NRF is a guide to how the Nation conducts all-hazards response, through a whole community approach. It describes core capabilities for response, defines specific authorities, and establishes a comprehensive approach for responding to domestic incidents that range from serious but purely local events to large-scale terrorist attacks or catastrophic natural disasters. The NRF is one of the five National Planning Frameworks; it builds on NIMS, which provides a consistent template for managing incidents. The NRF is available at www.fema.gov/national-response-framework.

2.1.2 National Incident Management System

NIMS, a companion document to the NRF, provides a systematic, nationwide, proactive approach guiding departments and agencies at all levels of government, the private sector, and non-governmental organizations. Its goal is to help these organizations work seamlessly to prepare for, prevent, respond to, recover from, and mitigate the effects of incidents, “...regardless of cause, size, location, or complexity—in order to reduce the loss of life, liberty, property, and harm to the environment.” NIMS provides a core set of concepts, principles, procedures, organizational processes, and standard requirements, including the Incident Command System (ICS). ICS offers standard terminology and common organizational structures. NIMS information is available at www.fema.gov/national-incident-management-system.

NIMS consists of five key components:

1. Preparedness (including, but not limited to, procedures, protocols, training and exercises, personnel qualifications, and evaluation);
2. Communications and information management (including, but not limited to, requirements for standardized communications and a common operating picture, based on reliability, interoperability, and scalability);
3. Resource management (including, but not limited to, resources needed to support critical incident objectives, in particular the process to identify, order, acquire, mobilize, track, demobilize, and inventory resources);
4. Command and management (including, but not limited to, three key organizational constructs: ICS, Multiagency Coordination [MAC] Systems, and Public Information);
5. Ongoing management and maintenance (including, but not limited to, the National Integration Center and Supporting Technologies that support both routine maintenance and continuous review of NIMS and associated research and development).

2.1.3 Foreign Animal Disease Preparedness and Response Plan

APHIS Veterinary Services (VS) established FAD PReP to provide guidance for preparing and responding to a foreign animal disease (FAD) emergency. The precursor to FAD PReP was the NAHEMS, which offered a functional veterinary framework for responding to FADs like HPAI. Now incorporated into FAD PReP, the NAHEMS Guidelines join strategic concept of operations documents, disease response plans (such as this HPAI-specific plan), SOPs, and other materials to create a comprehensive approach to FADs that is consistent with NRF and NIMS. These documents aim to ensure a successful response commensurate with the severity of the outbreak. Federal, State, and local agencies; Tribal nations; and other stakeholder groups involved in animal health emergency management activities should integrate the information found in these documents into their preparedness and response planning activities and processes.

FAD PReP offers

- ◆ competent veterinary guidance on cleaning and disinfection, disposal, mass depopulation, and other activities;
- ◆ information on disease control and eradication strategies and principles;
- ◆ guidance on health, safety, and personal protective equipment issues;

- ◆ biosecurity information and site-specific management strategies; and
- ◆ training and educational resources.

These documents provide the foundation for coordinated national, regional, State, Tribal, and local activities in an emergency situation. They also serve as a practical guide and complement non-Federal preparedness activities.

[Appendix A](#) provides more information on FAD PReP and associated materials. All documents that have been cleared by APHIS Legislative and Public Affairs are posted on the FAD PReP website: www.aphis.usda.gov/fadprep. This website also hosts critical policy updates relating to ongoing FAD outbreaks.

2.1.4 Coordination and Collaboration

This *HPAI Response Plan* is coordinated with the other FAD PReP documents, which are consistent with the tenets, terminology, and processes found in NRF and NIMS. This document provides strategic guidance for responding to an HPAI outbreak. Other FAD PReP documents provide information on general veterinary activities and include industry or facility manuals as well as SOPs for planners and responders. Together, these documents provide strategic and tactical details for Federal, State, Tribal, and local officials that are useful for HPAI preparedness and response. Building on existing planning and response knowledge and relationships, FAD PReP efforts raise awareness of critical issues in FAD response and foster further collaboration between Federal partners, States, Tribes, industry, academia, and other stakeholders.

2.2 FEDERAL ROLES, RESPONSIBILITIES, AND PLANNING ASSUMPTIONS

2.2.1 Overview

Understanding the roles and responsibilities of Federal departments or agencies involved in responding to a domestic incident of an FAD promotes an effective, coordinated emergency response. The section that follows describes the roles, responsibilities, and authority of USDA in an HPAI response. The functions described are consistent with the roles and responsibilities outlined in the NRF.

Federal response to the detection of an FAD such as HPAI is based on the response structure of NIMS as outlined in the NRF. The NRF defines Federal departmental responsibilities for sector-specific responses. During the course of an HPAI outbreak response, the USDA may request Federal-to-Federal support (FFS) from other Federal departments and agencies. FFS refers to the circumstance in which a Federal department or agency requests Federal resource support under the NRF that is not addressed by the Stafford Act or another mechanism.

2.2.2 USDA Roles and Responsibilities Overview

As the primary Federal agency for incident management during an FAD event of livestock or poultry, like an HPAI outbreak, USDA APHIS deploys Incident Management Teams (IMTs), coordinates the incident response, manages public messages, and takes measures to control and eradicate HPAI. Measures used to control and eradicate HPAI include surveillance and diagnostics, quarantine and movement control, biosecurity measures, epidemiological investigations, appraisal and compensation, depopulation (euthanasia) of affected poultry, carcass disposal, and cleaning and disinfection. In some cases, emergency vaccination may be used.

The USDA performs the coordination role in Emergency Support Function (ESF) #11—Agriculture and Natural Resources—under the NRF. As stated in ESF #11, USDA responds “to animal and agricultural health issues” under USDA statutory authority. Under ESF #11, APHIS is responsible for detecting “animal disease anomalies,” assigning “foreign animal disease diagnosticians to conduct investigations,” and coordinating “tasks with other ESFs, State veterinary emergency response teams, and voluntary animal care organizations to respond.”

USDA (not including the additional ESF responsibilities carried by the U.S. Forest Service, which is part of USDA) also plays supporting roles in the following ESFs:

- ◆ ESF #1—Transportation
- ◆ ESF #2—Communications
- ◆ ESF #3—Public Works and Engineering
- ◆ ESF #5—Information and Planning
- ◆ ESF #6—Mass Care, Emergency Assistance, Temporary Housing, and Human Services
- ◆ ESF #7—Logistics
- ◆ ESF #8—Public Health and Medical Services
- ◆ ESF #9—Search and Rescue
- ◆ ESF #10—Oil and Hazardous Materials Response
- ◆ ESF #12—Energy
- ◆ ESF #15—External Affairs.

During the course of an HPAI outbreak response, USDA may request support as necessary from other Federal agencies. If the President declares an emergency or major disaster, or if the Secretary of Agriculture requests the Department of Homeland Security (DHS) lead coordination, the Secretary of Homeland Security and DHS assume the lead for coordinating Federal resources. USDA maintains the lead of overall incident management.

For more information on the roles of other Federal agencies, such as the Departments of Health and Human Services (HHS) and the Interior (DOI), in the event of an HPAI outbreak, see the *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0) at www.aphis.usda.gov/fadprep.

2.3 AUTHORITY

The Animal Health Protection Act (AHPA), 7 *U.S. Code* 8301 et seq., authorizes the Secretary of Agriculture to restrict the importation, entry, or further movement in the United States or order the destruction or removal of animals and related conveyances and facilities to prevent the introduction or dissemination of livestock pests or diseases. It authorizes related activities with respect to exportation, interstate movement, cooperative agreements, enforcement and penalties, seizure, quarantine, and disease and pest eradication. The Act also authorizes the Secretary to establish a veterinary accreditation program and enter into reimbursable fee agreements for pre-clearance abroad of animals or articles for movement into the United States.

Section 421 of the Homeland Security Act, 6 *U.S. Code* 231 transfers to the Secretary of Homeland Security certain agricultural import and entry inspection functions under the AHPA, including the authority to enforce the prohibitions or restrictions imposed by USDA.

The Secretary of Agriculture has the authority to cooperate with other Federal agencies, States, or political subdivisions of States, national or local governments of foreign governments, domestic or international organizations or associations, Tribal nations, and other persons to prevent, detect, control, or eradicate HPAI. If measures taken by a State or Indian Tribe to control or eradicate a pest or disease of livestock are inadequate, the AHPA authorizes the Secretary, after notice to and review and consultation with certain State or Tribal officials, to declare that an extraordinary emergency exists because of the presence in the United States of a pest or disease of livestock that threatens the livestock of the United States (7 *U.S. Code* 8306).

For further information on USDA APHIS authorities, see the *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0) at www.aphis.usda.gov/fadprep.

Chapter 3

USDA HPAI Preparedness and Response

3.1 USDA

USDA APHIS is the Federal agency with primary responsibility and authority for agricultural animal disease control. It interfaces with Federal, State, Tribal, and local partners in HPAI eradication and control efforts. If the President declares an emergency or major disaster, or if the Secretary of Agriculture requests that DHS lead coordination, the Secretary of Homeland Security and DHS lead the coordination of FFS and Federal resources for the incident while USDA maintains the lead of overall incident management.

USDA is the primary Federal liaison to the U.S. animal industry. In addition, it operates the National Veterinary Services Laboratories (NVSL), including NVSL-Ames, which is an OIE reference laboratory for identifying and confirming HPAI. USDA also administers a National Wildlife Disease Program that provides assistance for the targeted surveillance of emerging and known diseases in wildlife, including AI.

The following sections detail USDA APHIS activities to prepare for an HPAI outbreak.

3.1.1 Preparedness Exercises and Training

Preparedness and response exercises help ensure our Nation is able to respond quickly and effectively to an HPAI outbreak. Exercises provide an ideal, no-fault learning environment to discuss, practice, and implement plans, procedures, and processes in advance of an actual event. APHIS exercises are conducted in accordance with Homeland Security Exercise and Evaluation Program guidance.

Multiple preparedness exercises and training events have been conducted to simulate an HPAI outbreak and response effort in the United States. These exercises and other events allow responders from all sectors—Federal, State and Tribal, local, industry, and academia—to discuss and practice critical activities (as discussed in [Chapter 5](#)) that would be required in an HPAI outbreak response. VS recently initiated a revitalized training and exercise program to address topics such as animal disease incident management, emergency operations, and salient current issues. Additionally, the Surveillance, Preparedness, and Response Services (SPRS) Logistics Center, which includes the National Veterinary Stockpile (NVS), has conducted multiple exercises to deliver and stage supplies. Valuable lessons learned and important recommendations have resulted from these exercises and other events.

3.1.2 Domestic Activities

USDA has a variety of ongoing preparedness and response activities with respect to HPAI, many of which have been significantly ramped up in response to recent events. Domestically, the USDA prevents the introduction of AI at its borders, performs FAD investigations, and monitors all H5 and H7 AI viruses in U.S. commercial broilers, layers, and turkeys; their respective breeders; backyard flocks; and the LBMS. In addition to import restrictions on poultry and poultry products from all countries or regions affected by HPAI in poultry, a critical component of these domestic activities is the AI surveillance program. The following list details a selection of ongoing USDA activities:

- ◆ *Poultry surveillance and diagnostics.* APHIS has a two-pronged approach to AI surveillance:
 - The first is through the National Poultry Improvement Plan, a voluntary Federal-State-industry cooperative program that conducts AI surveillance in (1) egg- and meat-type chicken and turkey breeding flocks, including game fowl and hobby poultry breeding flocks, and (2) commercial table-egg layer chickens, meat-type chickens (boilers, roasters, fryers, etc.), and meat-type turkeys.
 - The second is through AI surveillance in the LBMS. APHIS is currently cooperating with States that are conducting surveillance in their LBMS using a system of uniform standards established by a multi-stakeholder working group.
- ◆ *National Import Export Services (NIES).* NIES safeguards the poultry industry by working with other Federal agencies to ensure poultry products and birds imported into the United States are free of transmissible diseases under 9 CFR. This [link](#) provides information on the requirements for importing poultry and poultry products. The list of HPAI affected countries/regions for trade purposes is [here](#).
- ◆ *Wildlife surveillance.* APHIS Wildlife Services (APHIS WS) coordinates with universities and other entities to support wildlife surveillance and diagnostics. In the event of an HPAI outbreak, USDA APHIS WS works in close collaboration, communication, and coordination with DOI and other Federal, State, Tribal, and local wildlife agencies that have primary jurisdictional authority and subject matter expertise for wildlife. In response to the recent HPAI outbreak, APHIS WS, in coordination with the U.S. Fish and Wildlife Service, USDA APHIS VS, U.S. Geological Survey, and the National Flyway Council drafted a comprehensive plan for wild bird surveillance in migratory flyways (found [here](#)).
- ◆ *Smuggling Interdiction and Trade Compliance (SITC).* SITC conducts risk management and anti-smuggling activities to prevent unlawful entry and

distribution of prohibited agricultural commodities. It looks at domestic markets likely to have illegal imported avian products to establish baseline estimates on how much product is bypassing ports of entry.

- ◆ *Emergency veterinary assistance.* USDA works to assist States in training and maintaining State IMTs and veterinary reserve corps, such as the National Animal Health Emergency Response Corps (NAHERC), ([Section 3.5](#)). State groups serve as early response teams for an HPAI event and can educate stakeholders on AI signs, symptoms, and reporting procedures.
- ◆ *Public health.* USDA APHIS engages public health agencies to ensure coordination in the event of an HPAI outbreak in poultry; a USDA APHIS VS representative from the One Health Coordination Center is designated as a Centers for Disease Control and Prevention (CDC)-based liaison. APHIS engages and coordinates with CDC during any HPAI outbreak.
- ◆ *Animal Care.* APHIS Animal Care works with the American Zoological Association (AZA) to establish effective surveillance plans for AI. Facilities that participate undertake active and passive surveillance of exhibit and wild birds on their premises. AI testing is already undertaken at all AZA zoos; AZA actively works with APHIS Animal Care and VS to develop HPAI response plans and procedures for zoo collections.
- ◆ *Modeling.* The USDA Center for Epidemiology and Animal Health (CEAH) uses complex disease spread simulation models, such as Interspread Plus and the Animal Disease Spread Model (ADSM), to develop computer-generated outbreak scenarios for HPAI. The results of these models can be further analyzed using economic modeling tools. Other modeling tools are used to examine within flock spread, plume dispersion, and geospatial risk factors. Together, these tools are used to explore possible control strategies and evaluate the potential consequences of HPAI incursions in the United States, helping to estimate the countermeasures, materials, and supplies needed for control and eradication.
- ◆ *Education.* A key USDA initiative is Biosecurity for the Birds, which provides materials, messages, and biosecurity information on how to protect poultry from diseases including AI. Biosecurity for the Birds (<http://healthybirds.aphis.usda.gov>) encourages awareness about AI amongst bird owners (poultry and pet birds) and the public. Importantly, information is available in multiple languages.

3.1.3 International Activities

In addition to the domestic activities discussed above, the USDA also has ongoing international activities to bolster HPAI preparedness planning and response capabilities:

- ◆ *Emergency veterinary assistance.* USDA APHIS works to provide technical assistance and expertise, at a country's request, in the event of an animal health emergency.
- ◆ *International coordination.* USDA APHIS collaborates with other agencies and international partners to mitigate, prevent, and control HPAI threats outside the United States through the sharing of information and development of infrastructure.

3.1.4 International Trade

USDA, in collaboration with the Department of State and the United States Trade Representative, promptly addresses foreign governments that impose unjustifiable U.S. poultry and product trade restrictions because of an HPAI case. These efforts focus on cases where bans are inconsistent with OIE standards, or with any U.S. AI bilateral protocols.

USDA overseas embassy offices have guidance on how to rapidly report trade disruptions to Washington, DC, headquarters and how to help foreign officials respond to such events. Multiple USDA agencies, led by the Foreign Agricultural Service, coordinates a response to any such trade disruption and communicates with industry in the United States. USDA APHIS would also quickly fulfill any official requests for additional scientific information, such as U.S. HPAI domestic poultry flock case surveillance, movement control measures, and laboratory diagnostics.

OIE member countries, like the United States, are to “immediately” notify the OIE of any confirmed HPAI cases in poultry, defined in the OIE *Terrestrial Animal Health Code (2015)* as “all domesticated birds, including backyard poultry, used for the production of meat or eggs for consumption, for the production of other commercial products, for restocking supplies of game, or for breeding these categories of birds, as well as fighting cocks used for any purpose.” In addition, member countries are to notify the OIE in the event of an LPAI H5 or H7 detection in poultry. International standards for HPAI do allow countries to impose bans (which may be country-wide or regional) on imports from countries with HPAI infection in poultry. USDA APHIS actively maintains a list of HPAI-affected countries [here](#).

3.1.5 Compartmentalization

Another tool that may mitigate the economic consequences of a disease outbreak is compartmentalization. Compartmentalization defines subpopulations of distinct health status by management and husbandry practices, as related to biosecurity. Compartmentalization is best implemented, as suggested by the OIE in the *Terrestrial Animal Health Code (2015)*, by trading partners through the establishment of parameters and agreement on necessary measures, *before a disease outbreak*.

Implementation of compartmentalization would rely on Federal and State animal health authorities as well as producers and industry stakeholders. The importing country must be satisfied that its animal health status is appropriately protected by the biosecurity measures undertaken by the exporting country.

Currently, no compartmentalization plans have been fully accepted or implemented in the United States.

Chapters 4.3 and 4.4 of the OIE *Terrestrial Animal Health Code (2015)* explain the concept and the application of compartmentalization.

3.2 USDA APHIS ORGANIZATIONAL STRATEGY

In the event of an HPAI outbreak, effective and efficient management of the situation and clear communication pathways are critical. A synchronized management and organizational structure supports the control and eradication actions. Accordingly, APHIS employs NIMS and the ICS organizational structures to manage response to an HPAI outbreak. ICS is designed to enable efficient and effective domestic incident management by integrating facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

3.3 APHIS INCIDENT MANAGEMENT STRUCTURE

The APHIS Administrator is the Federal executive responsible for implementing APHIS policy during an HPAI outbreak; the Administrator is supported by the APHIS Management Team (AMT) (Figure 3-1). Depending on the size of the outbreak, the APHIS Administrator and AMT may establish an APHIS-level MAC Group to coordinate resources; many of the MAC functions may be delegated to the VS Deputy Administrator, who is the Chief Veterinary Officer of the United States. The VS Deputy Administrator is supported by the VS Executive Team (VSET) to coordinate policy.

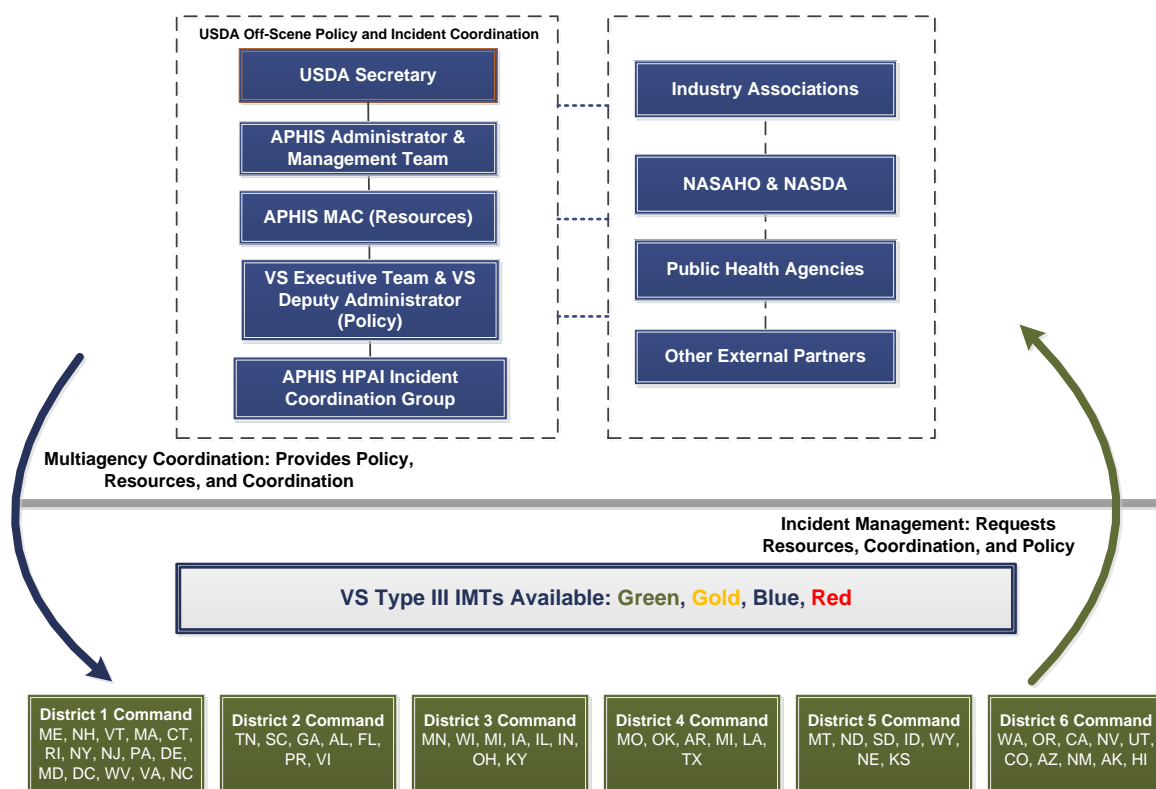
An APHIS Incident Coordination Group (ICG), with an Incident Coordinator, is immediately established to oversee the functions and response activities associated with the incident. This ICG is flexible and scalable to the size and

scope of the incident, and works closely with IC personnel in the field, in one or more IMTs (pictured in Figure 3-2). The ICG also coordinates with any MAC Group that is established at the APHIS or USDA level, based on the specific incident.

In addition to policy and incident coordination, the APHIS Administrator, AMT, VS Deputy Administrator, and VSET communicate, collaborate, and coordinate with relevant industry associations, the National Assembly of State Animal Health Officials (SAHOs) and National Association of State Departments of Agriculture, public health agencies (Federal and State), and other partners.

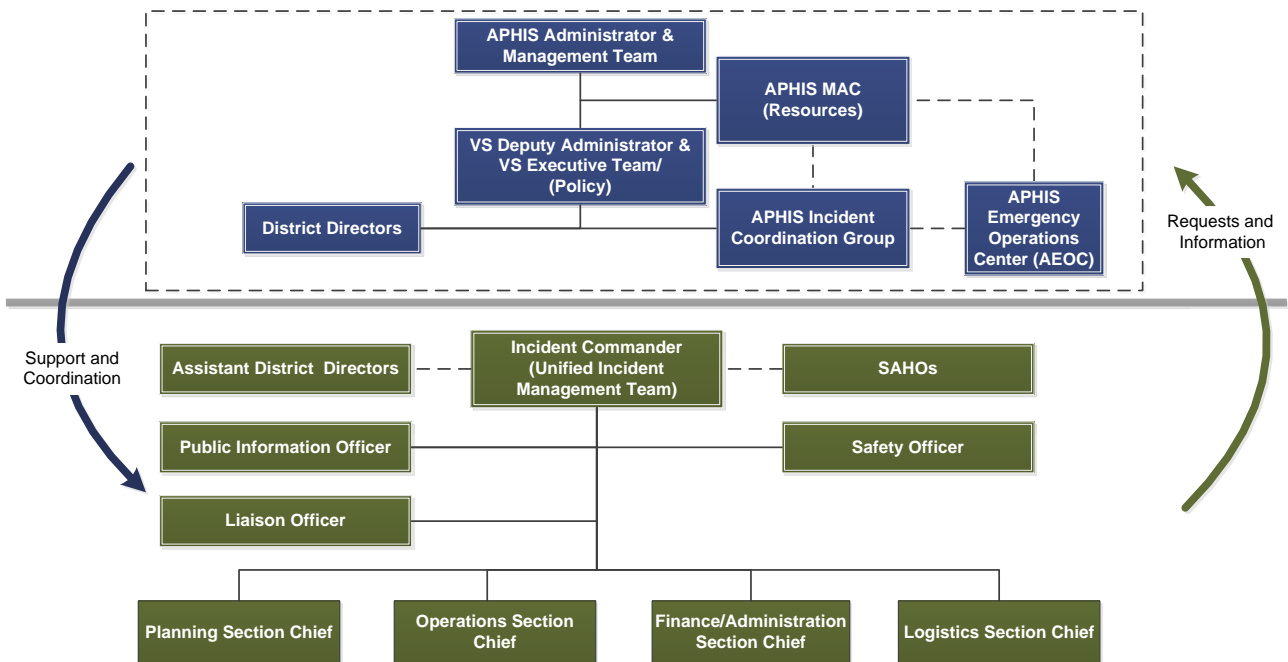
Figure 3-1 is an example of an overview of the relationship between USDA, APHIS, and VS Leadership, MAC Groups, ICG, IMTs, and Districts for an HPAI incident. Figure 3-2 provides more details on the MAC Groups, ICG, and IMTs. This is the incident management structure that was executed in the recent 2014–2015 outbreak; it may be modified or scaled based on the needs of future incidents.

Figure 3-1. Overview of USDA APHIS Multiagency Coordination, Incident Coordination Group, Field Personnel (Incident Management Teams and Districts), and Stakeholder Relationships for an HPAI Incident



Note: NASAHO = National Association of State Animal Health Officials, NASDA = National Association of State Departments of Agriculture; more IMTs may be available than pictured.

Figure 3-2. Details of USDA APHIS Multiagency Coordination, Incident Coordination Group, and an Incident Management Teams for an HPAI Incident



The following sections describe the MAC Group and APHIS ICG, as well as the APHIS organization for single and multiple incidents. The *APHIS Foreign Animal Disease Framework: Roles and Coordination (Foreign Animal Disease Preparedness and Response Plan [FAD PRoP] Manual 1-0)* contains more information.

3.3.1 Multiagency Coordination

MAC functions are executed at various levels, and typically include the coordination of policy, incident priorities, resource allocation and acquisition, and resolution of issues common to all parties. The size and scope of the HPAI incident dictates what levels and types of MAC Groups and MAC functions are required. However, these groups are not part of the on-scene IC.

An APHIS MAC Group would typically be composed of senior APHIS personnel that can reach across the agency to achieve effective coordination. In the event that there are significant threats or consequences to public health, the environment, or the economy, a USDA MAC Group could also be established, composed of high-level representatives from programs and agencies throughout the department. MAC Groups establish supportive relationships among departments, agencies, and units preparing for and responding to an HPAI outbreak. Further information can also be found in the *APHIS Emergency Mobilization Guide* (under revision, current version is [here](#)).

3.3.2 APHIS Incident Coordination Group

The APHIS ICG is responsible for acquiring resources, formulating policy options, and assisting in implementing response and recovery strategies for an HPAI outbreak. APHIS ICG responsibilities in an HPAI outbreak include

- ◆ providing policy guidance for response activities,
- ◆ providing information and coordination with health and safety personnel to ensure responder and public health and safety,
- ◆ supporting IMTs and their requirements,
- ◆ assisting in coordinating resources and integrating other organizations into the ICS, and
- ◆ providing information to the Joint Information Center (JIC) for use in media and stakeholder briefings.

The organization of the ICG varies by incident, but is consistent with NIMS and includes the typical Planning Section, Operations Section, Finance/Administration Section, and Logistics Section. It is led by a National Incident Coordinator and a Deputy Incident Coordinator. The ICG includes Groups and Units to handle functions such as epidemiology, policy, information management, diagnostics, budget, contracting, personnel, depopulation, disposal, and logistics.

3.3.3 Organization at the Field Level

At the beginning of an incident, the SAHO or designee, and the Assistant District Director (ADD), or designee, initially serve as Co-Incident Commanders in a Unified IC structure. The ADD and SAHO (or their designees) may be relieved by a VS IMT as requested. To-date, VS has four standing IMTs. These IMTs establish Incident Command Posts (ICPs), which serve as the base of deployment for field personnel. These remain unified State-Federal IC organizational structures.

If there is more than one incident, more than one IC is likely to be established. An Area Command (AC) may also be established; in this case, an Area Commander would be delegated authority for managing all incidents in his/her geographical area. In this case, individual Incident Commanders would report to the AC. AC organizational structures may not be established or appropriate in all incidents.

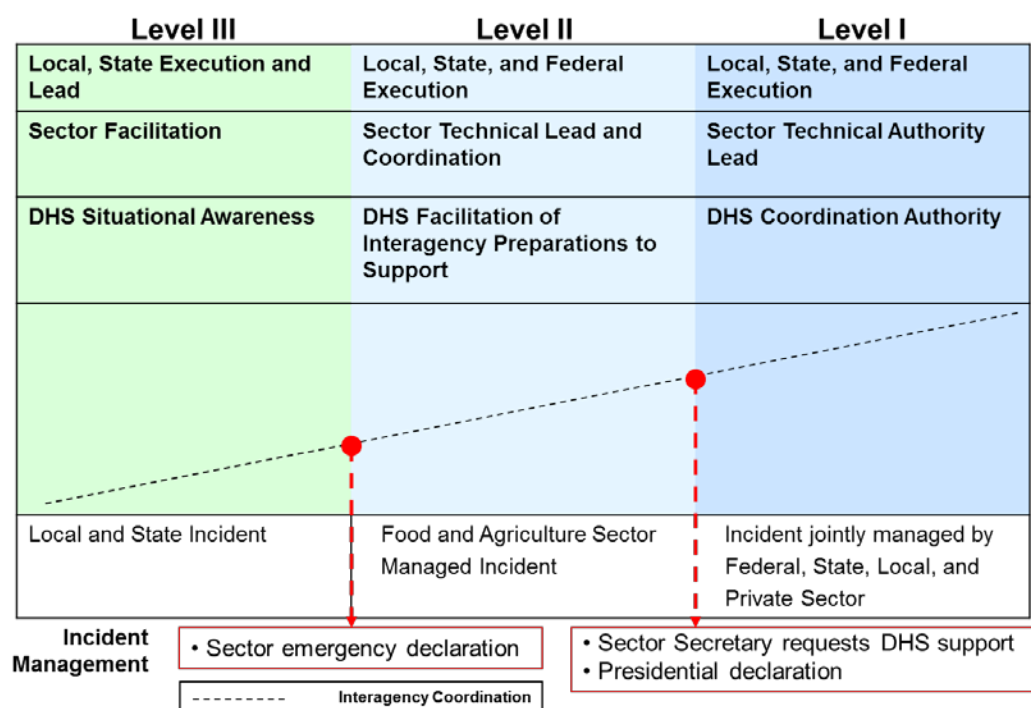
3.3.4 Guidance on Incident Management and Organizational Strategy

Additional information and updates are being developed based on the HPAI 2014–2015 outbreak.

3.4 APHIS INCIDENT MANAGEMENT LEVELS

APHIS uses a three-level system of emergency response/incident management types. The levels range from Level III, which has the lowest significance, to Level I, which is an event of national significance. The levels are used both within APHIS and externally to communicate the resource requirements for an event or incident. Figure 3-3 illustrates these three incident management levels. In Figure 3-3, sector refers to the agriculture sector and USDA. Additional information can be found in the *APHIS Emergency Mobilization Guide* and in the *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0).

Figure 3-3. Incident Management Levels



These levels are as follows:

- ◆ *Level III.* A response to an event or incident the scope or severity of which the lead program unit is evaluating or that requires a limited response. In either case, enough resources (Federal, State, or local personnel) are available in the area or State to staff the evaluation or initial response effort. An equine piroplasmiasis outbreak would be a Level III incident.
- ◆ *Level II.* A response to an event or incident that requires resources beyond an area or State's resource capacity but which is within the lead program unit's ability to provide resources to support the response. Requests for additional resources outside the lead program unit are not necessary for a Level II response. However, volunteers are considered for assignment

from outside the unit if they wish to be considered for the assignment, have supervisory approval, and are qualified for the position requested. Typically, a small to moderate HPAI outbreak in domestic poultry would be a Level II event.

- ◆ *Level I.* A response that requires resources or expertise beyond the lead program unit's capacity to respond. In many cases, these emergencies will be of national significance. If the lead program unit lacks the qualified resources to meet the response needs, it makes a request through the VSET to the APHIS Administrator to declare a total mobilization. If qualified volunteers are insufficient, direct assignments are made. A multistate foot-and-mouth disease outbreak would be a Level I event.

3.5 NATIONAL ANIMAL HEALTH EMERGENCY RESPONSE CORPS

In addition, NAHERC assists and augments Federal and State response to domestic and international animal disease outbreaks, threats, or natural disasters. NAHERC is composed of veterinary medical officers and animal health technicians who volunteer to become temporary Federal employees in the event of a national animal health emergency. After appropriate training, NAHERC members can be deployed to the field for response activities.

3.6 DIAGNOSTIC RESOURCES AND LABORATORY SUPPORT

USDA also has critical diagnostic resources and laboratory support that are leveraged in an HPAI outbreak.

3.6.1 National Veterinary Services Laboratories

The NVSL is the official reference laboratory for FAD diagnostic testing and study in the United States. The NVSL performs animal disease testing in support of USDA-APHIS programs designed to protect the health of U.S. poultry and livestock. The NVSL provides *all* confirmatory testing for HPAI on all specimens, including those found presumptively positive at a National Animal Health Laboratory Network (NAHLN) laboratory or other USDA-approved laboratory. The NVSL has two locations for FAD diagnostic testing: Ames, IA (NVSL-Ames), and the Foreign Animal Disease Diagnostic Laboratory (FADDL), Plum Island, NY (NVSL-FADDL). NVSL-Ames provides confirmatory testing for HPAI.

3.6.2 National Animal Health Laboratory Network

As of the date of publication, the NAHLN consists of more than 60 laboratories and coordinates the veterinary diagnostic laboratory capacity of State animal health laboratories and their extensive infrastructure, including facilities, equipment, and professional expertise. Of these laboratories, over 55 are currently approved to perform AI testing diagnostics ([Appendix B](#)).

The NAHLN provides a means for early detection of AI, rapid response through surge capacity to test outbreak samples, and recovery by the capability to test large numbers of samples to show freedom from AI. The confirmation of an HPAI outbreak is made at NVSL-Ames. After positive confirmation of HPAI, subsequent samples from premises inside the established Control Area may be sent directly to laboratories that are part of NAHLN. Please see [Section 5.4](#) for more information on diagnostics.

3.6.3 Center for Veterinary Biologics

APHIS's Center for Veterinary Biologics is responsible for licensing new products, including new diagnostic test kits and vaccines for AI. This work—centered on enforcement of the Virus Serum Toxin Act—ensures that pure, safe, potent, and effective veterinary biologics are available for the diagnosis, prevention, and treatment of animal diseases.

Chapter 4

HPAI Outbreak Response Goals and Strategy

This chapter covers a wide range of information about how USDA APHIS, States, Tribal Nations, localities, and stakeholders respond to an HPAI outbreak in poultry in the United States. In particular, this chapter

- ◆ identifies USDA APHIS goals for responding to an HPAI outbreak,
- ◆ identifies critical activities and tools required to achieve the response goals,
- ◆ discusses the epidemiological principles for an HPAI response effort,
- ◆ provides the USDA APHIS primary response strategy for HPAI in poultry,
- ◆ introduces factors influencing the scope of regulatory intervention, and
- ◆ reviews the international standards from the OIE for AI.

4.1 RESPONSE GOALS

The goals of an HPAI response are to (1) detect, control, and contain HPAI in poultry as quickly as possible; (2) eradicate HPAI using strategies that seek to protect public health and the environment, and stabilize animal agriculture, the food supply, and the economy; and (3) provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products. Achieving these three goals will allow individual poultry facilities, States, Tribes, regions, and industries to resume normal production as rapidly as possible. The objective is to allow the United States to regain disease-free status without the response effort causing more disruption and damage than the disease outbreak itself.

The United States protects its poultry from HPAI through a number of measures, including extensive AI surveillance, import restrictions, and education programs ([Chapter 3](#)). In the event of an HPAI outbreak, USDA and the affected State(s) work with the poultry industry to control and eradicate the disease as expeditiously as possible. In an HPAI outbreak, APHIS coordinates with the CDC and other public health authorities, including at the State, Tribal, and local level, as needed. APHIS also collaborates with the DOI and other Federal, State, tribal, and local wildlife agencies that have primary jurisdictional authority and subject matter expertise for wildlife.

4.2 PRINCIPLES, CRITICAL ACTIVITIES, AND TOOLS FOR AN HPAI RESPONSE

4.2.1 Critical Activities

In order to achieve the goals of an HPAI response, critical activities and tools must be implemented to successfully execute the response strategy. Box 4-1 lists these critical activities and tools. A science- and risk-based approach that protects public, animal health, the environment, and stabilizes animal agriculture, the food supply, and the economy is employed at all times. Please see [Chapter 5](#) for further information on these activities and tools.

Box 4-1. Critical Activities and Tools for an HPAI Response

Critical Activities and Tools for Containment, Control, and Eradication

- Public communication and messaging campaign
- Swift imposition of effective quarantine and movement controls
- Stringent and effective biosecurity measures
- Rapid diagnosis and reporting
- Epidemiological investigation and tracing
- Increased surveillance
- Continuity of business measures for non-infected premises and non-contaminated animal products (Secure Food Supply Plans—Egg, Turkey, Broiler)
- Rapid mass depopulation and euthanasia, potentially including preemptive depopulation
- Effective and appropriate disposal procedures
- Cleaning and disinfection measures
- Emergency vaccination (as the response strategy indicates).

4.2.2 Epidemiological Principles

Three basic epidemiological principles form the foundation to contain, control, and eradicate HPAI in the U.S. poultry population:

1. *Prevent contact between the HPAI virus and susceptible poultry.*
 - a. This is accomplished through quarantine of infected poultry and movement controls in the Infected Zone(s) (IZ) and Buffer Zone(s) (BZ) (Control Areas [CA]), along with biosecurity procedures to protect non-infected poultry.
 - b. Certain circumstances may warrant accelerating the depopulation or slaughter of poultry at risk for exposure to HPAI to decrease the population density of susceptible poultry.

- c. There is a serious transmission risk posed by people, material, conveyances, and animals that may have been in contact with HPAI and serve as mechanical vectors. Contact between poultry and these items should be prevented, and transmission risk mitigated through stringent biosecurity and cleaning and disinfection measures.
2. *Stop the production of HPAI virus by infected or exposed animals.* This is accomplished by rapid mass depopulation (and disposal) of infected and potentially infected poultry.
3. *Increase the disease resistance of susceptible poultry to the HPAI virus or reduce the shedding of HPAI in infected poultry.* This may be accomplished by strategic emergency vaccination if a suitable vaccine is available and can be administered in a timely manner.

4.2.3 Coordinated Public Awareness Campaign

One of the most important critical activities is a public awareness campaign. Box 4-2 details the importance of effective communication and messaging to the overall HPAI response effort.

Box 4-2. Coordinated Public Awareness Campaign

Importance of Communication to Support Response

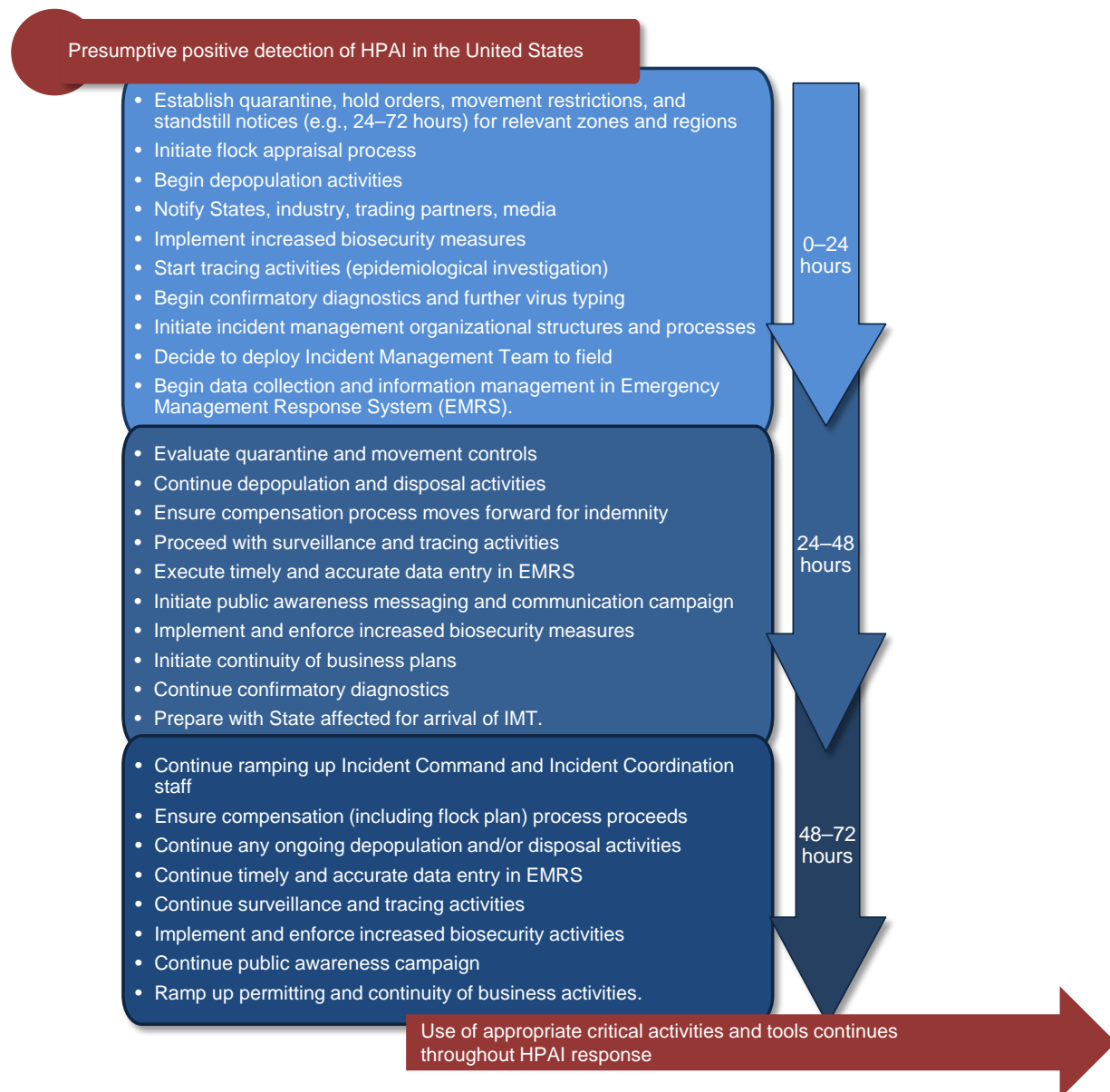
In all HPAI outbreaks, a public awareness campaign must be effectively coordinated with audience-appropriate information both created and distributed. This supports the response strategy by

- engaging and leveraging Federal, State, Tribal, local, and stakeholder relationships to provide unified public messages for local, national, and international audiences;
- addressing issues and concerns relating to food safety, public health, and animal welfare;
- addressing issues and concerns relating to interstate commerce, continuity of business, and international trade; and
- widely disseminating key communication messages to consumers and producers.

4.2.4 Timeline in Any HPAI Response for First 72 Hours

In the first 72 hours after the detection of HPAI in the United States, specific actions must occur; as seen in Figure 4-1, these critical tasks are fundamental to the rapid control and containment of HPAI. Figure 4-1 covers many of the most important tasks and activities, but is not all-inclusive. Each response effort is different; however, some activities—such as rapid appraisal and depopulation of affected flocks—are of ultimate importance in any HPAI outbreak.

Figure 4-1. Critical Activities in the First 72 Hours of U.S. HPAI Response



4.3 RESPONSE STRATEGY FOR CONTROL AND ERADICATION OF HPAI IN POULTRY

The United States' primary control and eradication strategy for HPAI in poultry is stamping-out. If the spread of HPAI outpaces the resources for stamping-out, or if other factors direct the response away from a stamping-out strategy alone, emergency vaccination strategies might be considered.

Currently, it is not possible to delineate *a priori* the specific factors that might signal the need to deviate from an exclusive stamping-out strategy in any given

outbreak. A decision to use emergency vaccination will be based on the prevailing epidemiological circumstances during the outbreak, as well as the availability of an appropriate vaccine. Please see [Chapter 5, Section 5.16](#) for information on emergency vaccination.

Regardless of the response strategy employed, critical activities and tools are employed, such as health and safety, biosecurity, surveillance, depopulation, disposal, and movement control (see [Chapter 5](#)). [Chapter 4](#) provides general strategic guidance for a response to the detection of HPAI in poultry.

4.3.1 Defining Stamping-Out as a Response Strategy for Poultry

Stamping-out is the depopulation of clinically affected and in-contact susceptible poultry. [Box 4-3](#) lists the key elements of stamping-out (disposal issues are covered in [Section 5.14](#) in the next chapter). The OIE definition of stamping-out is provided in [Section 4.5.1](#).

Box 4-3. Strategy of Stamping-Out HPAI

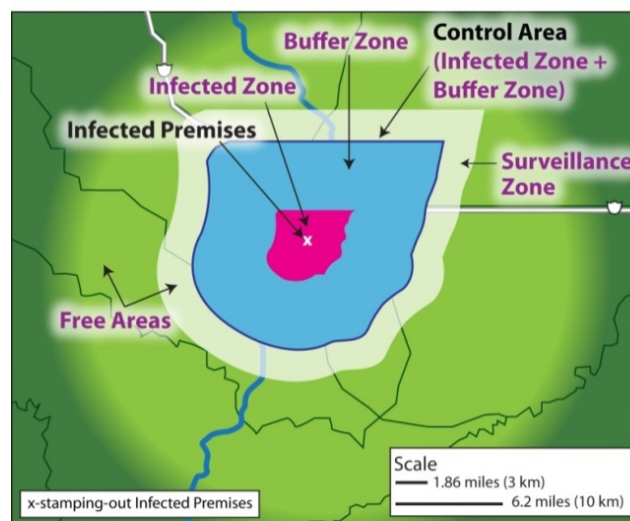
Stamping-Out: Critical Goals

- The goal is that, within 24 hours of (or as soon as possible after) a presumptive positive classification, infected poultry are depopulated in the quickest, safest, and most humane way possible. In many cases, poultry on Contact Premises (CP) or those meeting the suspect case definition may also be depopulated as soon as possible.
- Where resources are limited, premises are prioritized so that those with the highest potential for active HPAI spread are ‘stamped-out’ first.
- Based on the epidemiology of the outbreak, prioritizing the poultry to depopulate first may be necessary.
- Public concerns about stamping-out require a well-planned and proactive public relations and liaison campaign. Stakeholders, the public, and the international community must be involved.

4.3.2 Zones and Areas in Relation to Stamping-Out

Figure 4-2 shows an example of a stamping-out strategy, where Infected Premises (IP) are depopulated. See [Section 5.5](#) in [Chapter 5](#) for more information on zones, areas, and premises for HPAI outbreak response.

Figure 4-2. Example of Zones and Areas in Relation to Stamping-Out (Infected Premises would be Depopulated)



4.3.3 Assessing a Possible Outbreak

During the investigation of premises suspected of having HPAI, animal health responders use clinical signs, history, and professional judgment to determine the likelihood that HPAI exists on the premises. Appropriate control measures are initiated based on this rapid assessment. This assessment includes

- ◆ a history of clinical and epidemiological findings,
- ◆ results of physical examinations,
- ◆ necropsy findings,
- ◆ specimen collection and submission to an approved laboratory, and
- ◆ reporting/situational information.

Incident management includes quarantine and movement control, tracing, activation of response plans, and communication of these actions to all stakeholders, the public, and the international community. Cooperative Federal, State, Tribal, local, and industry response measures are carried out with extreme urgency using the broadest geographic scope appropriate.

If HPAI has not been or cannot be detected on a premises, but epidemiological evidence indicates that the disease has spread beyond the initial premises, the premises should be treated as presumptive positive premises and control and containment measures implemented.

4.3.4 Authorization for Response and Associated Activities

When the criteria for a presumptive positive HPAI case have been met (see [Chapter 5](#) for case definitions), the APHIS Administrator or VS Deputy Administrator (Chief Veterinary Officer [CVO] of the United States) can authorize APHIS personnel—in conjunction with State, Tribal, and IC personnel—to initiate depopulation, cleaning, and disinfection procedures of the index case (IP) and investigation of Contact Premises (CP). Depopulation of poultry on CP, or those meeting the suspect case definition, may also be warranted and conducted depending on the epidemiological information; this action will be authorized by APHIS and SAHOs/Tribal officials. The need to initiate depopulation of poultry and cleaning and disinfection procedures on other poultry flocks in a radius up to 3 kilometers around the index case (IP) in the IZ may also be assessed.

HPAI may be listed as a disease reportable to animal health or public health officials depending on the laws and policy of the State or Tribal nation. In some States, all FADs or animal diseases of consequence are listed for reporting to a State authority, which would include HPAI. Detection of HPAI may result in emergency intervention by Federal, State, Tribal, and/or local authorities.

When HPAI is detected, SAHOs and Tribal officials issue a quarantine, hold order, or standstill notice for the IP based on the authority and regulations of the affected State. A Federal quarantine may be issued when requested by SAHOs or as directed by the Secretary of Agriculture; Federal quarantines may not always be issued in HPAI outbreaks. The Incident Commander works with the Operations Section and Planning Section in the IMT to determine zone, area, and premises designations during an HPAI outbreak. These designations are captured in the Emergency Management Response System (EMRS).

4.3.5 Management of Incident

The outbreak response effort should be implemented through ICS with an appropriate span of control and delegation of authority. Response management and associated critical activities are as local as possible. Good communication within and outside the chain of command is imperative (i.e., both within the ICS structure in an IMT as well as between the IMT and ICG as discussed in [Chapter 3](#). Clear, consistent, and timely communication to stakeholders and industry is also critical).

As soon as possible, an Incident Coordinator and Incident Commander should be identified, an IMT may be deployed, and a unified State-Federal ICP established. In-State resources (whether Federal, State, Tribal, local, or privately owned) should be used to manage the response. If the response requires, out-of-State resources may be used to support the State impacted by the outbreak.

If the outbreak involves wild birds, USDA collaborates with Federal and State agencies, including DOI, that have jurisdictional authority over wild birds. The USDA also notifies and coordinates with public health agencies in response to an HPAI detection in poultry.

4.3.6 Control and Eradication Strategy for Other Species

4.3.6.1 CAPTIVE WILD BIRDS

Should detections occur in captive wild birds (e.g., falcons or gyrfalcons used in falconry), these cases are managed individually based on the best information available to Federal and State animal health authorities. Captive wild birds (on premises *without* other poultry) may be quarantined under State authority and allowed to recover; diagnostic testing indicates when those birds are free of HPAI. An epidemiological investigation is conducted for all HPAI detections in captive wild birds. This assessment dictates the extent and duration of surveillance required in the surrounding area/premises.

4.3.6.2 OTHER ANIMALS

Susceptible animals, as referred to in this response plan, are limited to poultry unless otherwise specified in the case definition used during the outbreak. Additional susceptible animals or species may be determined, as needed, by the current knowledge of the epidemiology of the event. The USDA notifies and coordinates with public health agencies and authorities in a response to a detection of HPAI in domestic poultry or other animal species. For more specific information on roles and responsibilities, please see the *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0).

Influenza viruses are typically adapted to a specific animal species and have a relatively high transmission barrier between species. However, interspecies transmission of influenza A viruses can occur. In particular, the transmission and genetic re-assortment of influenza A viruses among humans, swine, and avian species has been well documented. In the event of an HPAI outbreak, appropriate biosecurity measures are implemented so that contact between infected poultry and all other susceptible animals is avoided. Should other species, besides poultry, become infected with HPAI virus, these animals are appropriately monitored to ensure that currently infected animals are not sent to slaughter or other premises. Other measures that are appropriate to the given situation may be applied based on the recommendation of the Incident Commander(s) and National Incident Coordinator. To limit human exposure, in addition to appropriate biosecurity and health and safety precautions, other strategies may be implemented based on the recommendations of USDA APHIS and public health agencies.

4.4 FACTORS INFLUENCING RESPONSE

Previous sections identified the primary response strategy (stamping-out) for an HPAI outbreak. Detection of HPAI may result in emergency intervention by Federal, State, Tribal, and/or local authorities; the scope of regulatory intervention depends on the following factors:

- ◆ *Consequences of the HPAI outbreak.* The consequences of the HPAI outbreak, and the impact of the response, in terms of disruptions to national security, food security, animal health, public health, environment, economy, interstate commerce, international trade, and regulatory issues.
- ◆ *Acceptance.* Acceptance of response policy and strategy (social and political) by different communities, from local to international. This includes all stakeholders.
- ◆ *Scale of outbreak.* The number of poultry infected, species infected, number of premises infected, type of premises affected, and poultry population density for infected areas or high risk area.
- ◆ *Rate of outbreak spread.* The rate of spread of infection in terms of number of premises, types of premises, number of susceptible poultry, types of poultry; rate at which each IP “reproduces” or results in new IP.
- ◆ *Veterinary countermeasures available.* The availability and efficacy of veterinary countermeasures, particularly HPAI vaccines; the acceptance of any emergency vaccination strategy.
- ◆ *Resources available to implement response strategies.* The capabilities and resources available to eradicate HPAI in poultry and to control and eradicate HPAI in potential wildlife reservoirs.

4.5 INTERNATIONAL STANDARDS FOR AI

4.5.1 OIE Standards for HPAI Response

In terms of general international standards, for countries that have competent veterinary authorities, the initial response eradication policy for HPAI outbreaks is stamping-out. Stamping-out, as defined in the OIE *Terrestrial Animal Health Code (2015)* means

A policy designed to eliminate an outbreak by carrying out under the authority of the Veterinary Authority the following:

- a. The killing of animals which are affected and those suspected of being affected in the herd and, where appropriate, those in other herds which have been exposed to infection by direct animal to animal contact, or by indirect contact with the causal pathogen; this includes all susceptible animals, vaccinated or unvaccinated, on infected establishments; animals should be killed in accordance with Chapter 7.6.
- b. The destruction of their carcasses by rendering, burning or burial, or by any other method described in Chapter 4.12.
- c. The cleansing and disinfection of establishments through procedures defined in Chapter 4.13.

4.5.2 Recognition of Disease-Free Status

As a member of the OIE, the United States has agreed to abide by standards drafted and approved by member countries. The OIE does not grant official recognition for HPAI-freedom, but OIE members can self-declare their entire territory or a zone within their territory free from certain OIE-listed diseases, including HPAI.

In cases of self-declaration, delegates are advised to consult the OIE *Terrestrial Animal Health Code* for specific requirements for self-declaration of freedom from HPAI. By providing the relevant epidemiological evidence, the OIE member can prove to a potential importing country that the entire country or zone under discussion meets the provisions of the specific disease chapter. Any submitted self-declaration should contain evidence demonstrating that the requirements for the disease status have been met in accordance with OIE standards. This self-declaration must be signed by the official OIE delegate of the OIE member concerned. As mentioned in Article 10.4.27 of the OIE *Terrestrial Animal Health Code (2015)*, no member can declare itself free from influenza A infection in wild birds; the definitions for AI-free status apply to poultry only.

4.5.3 Criteria Needed for AI-Free Status

The OIE has two categories for country recognition for AI: (1) a country, zone, or compartment free from avian influenza (2) a country, zone, or compartment free from infection with high pathogenicity avian influenza viruses in poultry. These determinations are described in the OIE *Terrestrial Animal Health Code (2015)* in Articles 10.4.2, 10.4.3, and 10.4.4.

Per article 10.4.4, the OIE defines a country, zone, or compartment free from infection with high pathogenicity avian influenza viruses in poultry as follows:

A country, zone, or compartment may be considered free from infection with high pathogenicity avian influenza viruses in poultry when:

- 1) It has been shown that infection with high pathogenicity avian influenza viruses in poultry has not been present in the country, zone, or compartment for the past 12 months, although its status with respect to low pathogenicity avian influenza viruses may be unknown; or
- 2) When based on surveillance in accordance with Articles 10.4.27 to 10.4.33, it does not meet the criteria for freedom from avian influenza but any virus detected has not been identified as high pathogenicity avian influenza virus.

The surveillance may need to be adapted to parts of the country or existing zones or compartments depending on historical or geographical factors, industry structure, population data, or proximity to recent outbreaks.

If infection has occurred in poultry in a previously free country, zone, or compartment, the free status can be regained three months after a stamping-out policy (including disinfection of all affected establishments) is applied, providing that surveillance in accordance with Articles 10.4.27 to 10.4.33 has been carried out during that three-month period.

Chapter 5

Specific HPAI Response Critical Activities and Tools

FAD PReP documents identify critical activities and tools to be employed in the event of an HPAI outbreak. These critical activities and response tools assist in controlling, containing, and eradicating HPAI while facilitating continuity of business in an outbreak. This chapter describes key parts of these critical activities and tools.

Documents referenced in this chapter can be found at www.aphis.usda.gov/fadprep.

5.1 ETIOLOGY AND ECOLOGY

Information on the etiology and ecology of HPAI helps promote a common understanding of the disease agent among responders and other stakeholders (see [Chapter 1](#) for HPAI information). The *HPAI Overview of Etiology and Ecology SOP* contains additional information.

5.2 LABORATORY DEFINITIONS AND CASE DEFINITIONS

Laboratory and case definitions provide a common point of reference for all responders. The following definitions are applicable to poultry. If animals other than poultry become significant in the response effort, the case and laboratory definitions will be adapted by the IC to fit the prevailing epidemiological findings during an outbreak.

Case definitions and laboratory criteria are developed according to the *Case Definition Development Process SOP* (see [Section 5.2.3](#)). The H5/H7 AI definition is available in the following sections, and also on www.aphis.usda.gov/fadprep.

5.2.1 Laboratory Definitions

The following sections include definitions for H5/H7 AI, dated August 2015. For further information on the diagnostic tests conducted by NVSL in the event of an HPAI outbreak, please see [Section 5.4](#).

5.2.1.1 LABORATORY CRITERIA

Subclinical infections identified through active laboratory surveillance or clinical cases with compatible clinical signs and pathologic lesions in a susceptible species are evaluated using laboratory criteria for HPAI and LPAI H5/H7 defined by one or more of the following diagnostic strategies:

1. *Serologic tests:* Demonstration of influenza antibody by:
 - a. Agar gel immunodiffusion (AGID) OR USDA-licensed influenza A enzyme-linked immunosorbent assay (ELISA); AND
 - b. Confirmation of antibody to H5 or H7 by hemagglutination inhibition (HI).
2. *Antigen tests:* Detect presence of influenza A virus by:
 - a. Antigen capture immunoassays (ACIA): collect tracheal/oropharyngeal and/or cloacal swab samples from clinically ill or dead birds. ACIA (test kits approved by APHIS) are for flock level testing; the ability to detect low levels of infection is enhanced by testing multiple samples. Molecular confirmation of positive results is required; negative results with clinical signs require confirmatory diagnostics as indicated in VS Guidance 12001, “Policy for the Investigation of Potential Foreign Animal Disease/Emerging Disease Incidents (FAD/EDI).” Samples will be forwarded to USDA’s NVSL to determine subtype and pathotype.
 - b. Direct RNA detection: real-time reverse transcriptase polymerase chain reaction (rRT-PCR) using NVSL-approved molecular assays for influenza A and H5/H7 subtypes, WITH molecular determination of subtype and pathotype direct from swab sample by Sanger sequence methods, OR virus isolation with antigenic and/or molecular characterization.
3. *Virus isolation and identification:* Preferred specimens for virus isolation include tracheal/oropharyngeal and cloacal swabs, fresh feces from live or dead birds, or samples from organs pooled by system (e.g., respiratory-trachea, lungs, air sacs; enteric-intestine, spleen, kidney, liver; reproductive) from dead birds. A preparation of the specimen is inoculated into the allantoic cavity of susceptible embryonated chicken eggs. The eggs are incubated at 37°C for 4 to 5 days. The amniotic-allantoic fluid is harvested from inoculated embryos and tested for presence of virus by molecular, hemagglutination, or antigen capture methods with subtype (HA and NA) determination by molecular or HI and neuraminidase inhibition (NI) assays.
4. *Strain virulence evaluation:*
 - a. Determination of the amino acid sequence at the hemagglutinin cleavage site (of H5 and H7 viruses) to identify viruses that have the

- capacity to become highly pathogenic with or without elevated mortality in *in vivo* assays (see b. below).
- b. Viruses with an intravenous pathogenicity index (IVPI) greater than 1.2, or that cause at least 75 percent mortality within 10 days in 4- to 8-week-old chickens infected intravenously, are classified as HPAI.
 - c. If H5 or H7 subtypes do not meet the criteria for HPAI, they are classified as H5/H7 LPAI.
5. *Assumptions:* Influenza virus may be detected 48 hours post-infection (HPAI within 24 hours post-infection) by virus isolation or rRT-PCR (Spackman 2006) and 1–5 days post-infection by antigen capture enzyme immunoassay, when virus is shed at moderate to high levels (Gelb and Ladman 2006). Oropharyngeal/tracheal specimens are preferred for poultry because there generally are fewer inhibitors and therefore higher test sensitivity especially during the early phase of infection. While oropharyngeal/tracheal swabs are preferred for detection of AI in poultry, cloacal swabs are more preferred in wild birds. Presence of blood or fecal material in swab specimens (i.e., cloacal swabs) can result in lower sensitivity on the rRT-PCR assay due to the presence of non-specific inhibitors, and should be processed appropriately.

5.2.2 Case Definitions

The following sections include draft case definitions developed by APHIS VS Science, Technology, and Analysis Services (STAS) CEAH Surveillance Design and Analysis as of August 2015. These definitions may be revised at any time based on current epidemiological information.

5.2.2.1 CASE DEFINITION

1. *General comments:* AI virus can infect almost all species of birds. Domestic poultry defined as having illness compatible with OIE reportable AI infection (H5/H7 HPAI and LPAI) are those with one or more of the following clinical signs and gross lesions: reduction in normal vocalization; listlessness; conjunctivitis; drops in egg production sometimes with pale, misshapen or thin-shelled eggs; respiratory signs such as rales, snicking, and dyspnea; neurological signs such as incoordination or torticollis; a drop in feed and/or water consumption; swollen or necrotic combs and wattles; swollen head and legs; lungs filled with fluid and blood; tracheitis and airsacculitis; hemorrhages on the unfeathered parts of legs and feet; petechial hemorrhages on internal organs (Easterday et al. 1997); OR flocks that experience mortality as listed for each compartment as follows (S. Malladi and E. Gingerich, personal communications, 2013):
 - a. Commercial broilers: mortality exceeding 3.5 birds/1,000 per day.

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- b. Commercial layers: mortality exceeding 3 times the normal daily mortality per day (normal: 0.13 birds/1,000 per day for layers from 2 to 50 weeks, and 0.43 birds/1,000 per day for layers over 50 weeks); OR 5 percent drop in egg production for 3 consecutive days.
 - c. Commercial turkeys: mortality exceeding 2 birds/1,000 per day.
 - d. Broiler breeders: mortality exceeding 2 birds/1,000 per day.
 - e. Layer breeders: mortality exceeding 3 times the normal daily mortality per day (normal: 0.2 birds/1,000 per day prior up to 50 weeks, and 0.37 birds/1,000 per day after 50 weeks).
 - f. Turkey breeders: mortality exceeding 2 birds/1,000 per day; OR a decrease in egg production of 15 percent occurring over a 2-day period.
 - g. Small volume high-value commercial poultry and backyard flocks: any sudden and significant mortality event or sudden drop in egg production should be investigated.
2. *Suspect case:* Domestic poultry with:
- a. Illness compatible with H5/H7 AI infection; OR
 - b. Positive AGID or ELISA samples taken during routine surveillance with or without the presence of compatible illness; OR
 - c. Detection by ACIA using a commercially available influenza A antigen (test kit approved by APHIS) with the presence of compatible illness.
3. *Presumptive positive case:*
- a. A suspect positive case as defined above with detection of antibodies to influenza A in sera as determined by AGID serological test that cannot be explained by vaccination (USDA permission required for use in the United States), and subsequent subtyping by HI and NI as H5 or H7 with any NA subtype; OR
 - b. Domestic poultry with identification of influenza A RNA by rRT-PCR with or without the presence of compatible illness.
4. *Confirmed positive case:* Domestic poultry with antigen detection (virologic or molecular detection methods) AND the confirmation of the H5 or H7 subtype WITH subsequent determination of pathogenicity as described in Section 2.2 of the OIE Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (HPAI or H5/H7 LPAI) by NVSL.

5. *Epidemiological criteria and restrictions:* Surveillance efforts are restricted along the lines of the compartmentalization concept. Compartmentalization is intended to create a functional separation of the commercial poultry industry, the LBMS, backyard poultry flocks, and wild migratory waterfowl through management practices (Scott 2006). The efficacy of compartmentalization can be verified through surveillance information and evaluation.
 - a. Commercial poultry breeder and production flock surveillance (including many game bird breeders) is conducted through the NPIP.
 - b. Commercial meat-type chicken and meat-type turkey surveillance is an industry initiative of the National Chicken Council and National Turkey Federation that meets or exceeds the NPIP commercial surveillance program.
 - c. LBMS surveillance occurs through cooperative agreements between APHIS and participating SAHO. The federally funded and State-administered program is designed to enhance and unify existing State programs and to assist States in meeting their goals for prevention and control of H5/H7 LPAI in the LBMS. State programs often exceed APHIS minimum standards.
 - d. Surveillance of the non-traditional backyard compartment occurs through individual State surveillance programs in cooperation with APHIS.

5.2.3 Case Definition Development Process

The *Case Definition Development Process SOP* describes the general process for developing and approving animal disease case definitions for use in animal health surveillance and reporting.

CEAH (part of STAS), in cooperation and coordination with SPRS, develops animal disease case definitions for animal health surveillance and reporting. VS units and other stakeholders review draft definitions; the VS Deputy Administrator (U.S. CVO) and VSET approve the case definitions. Case definitions enhance the usefulness of animal disease data by providing uniform criteria for reporting purposes.

In any specific HPAI outbreak, case definitions may be edited within 24 hours of the first presumptive or confirmed positive case (index case). The case definitions are reviewed throughout the outbreak and modified on the basis of additional information or the changing requirements of the eradication effort.

5.3 SURVEILLANCE

Surveillance is a critical activity during an outbreak of HPAI. The following are goals in an HPAI outbreak:

- ◆ To implement surveillance plans within 48 hours of the confirmation of an outbreak.
- ◆ To implement a surveillance plan that (1) defines the present extent of HPAI and (2) detects unknown IP quickly.
- ◆ To have the surveillance plan consider the susceptible wildlife population in the area, to coordinate with APHIS, DOI, State wildlife agencies, and State agriculture departments to perform appropriate HPAI surveillance in relevant populations.
- ◆ To provide complete surveillance data summaries and analysis at intervals as specified by IC.
- ◆ To develop effective surveillance plans that can achieve desired outcomes by leveraging available resources, satisfying jurisdictional requirements, and implementing continuity of business measures.

At the APHIS level, the CEAH Surveillance Design and Analysis Unit is responsible for surveillance design and the SPRS is responsible for surveillance implementation. Box 5-1 lists the key objectives of surveillance activities during and immediately after an HPAI outbreak.

Box 5-1. Surveillance Objectives in an HPAI Outbreak

Surveillance Objectives

- Detect HPAI IP during an outbreak.
- Determine the size and extent of an HPAI outbreak.
- Supply information to evaluate outbreak control activities.
- Provide information for animal and product movement within the CA.
- Provide information for animal and product movement out of the CA.
- Prove disease freedom (DF) and regain disease-free status after eradication of the outbreak.

5.3.1 Surveillance Planning for HPAI Outbreak

5.3.1.1 GENERAL CONSIDERATIONS

A surveillance plan indicates the frequency, number, and distribution of animals and premises to be sampled. This requires tradeoffs be made among six

surveillance parameters, listed below. These tradeoffs are made employing initial information collected about the outbreak and best estimates. During an outbreak, surveillance plans change as new information becomes available. ([Appendix D](#) contains more detailed surveillance information.) The six surveillance parameters are:

1. *Design (threshold) prevalence.* The goal is to determine the lowest feasible prevalence that can be used to detect infected birds on premises: the chosen proportion of animals or premises infected that, if exceeded, will indicate the disease has been detected for a given confidence level and population size (1 percent vs. 5 percent vs. 15 percent).
2. *Confidence level.* The selected level (90 percent confident vs. 95 percent confident) that the disease can be detected for the chosen design threshold, given the population size.
3. *Types of tests.* Test choices—clinical inspection, polymerase chain reaction testing, serology testing, etc.—and the test cutoff values can influence the design prevalence choice. Each test has a sensitivity and specificity that varies with the cutoff values.
4. *Sampling frequency.* Previous negative test results can augment information gained from negative test results if the time period between sampling is short—ideally daily, but definitely less than the incubation period. The value of the previous negative test results decreases as the interval between sampling increases (daily vs. every other day).
5. *Risk-based sampling.* Selecting populations with a higher proportion of infected animals (1 percent vs. 10 percent) reduces the number of samples needed for a specific confidence level given the population size.
6. *Sampling scheme.* Within the selected population (risk-based or total population) a random, convenience, or other scheme may be used, and the choice will influence the number of animals/premises sampled.

5.3.1.2 SURVEILLANCE OBJECTIVES BY TIME PERIOD

There are three key segments of surveillance activity in an outbreak. These segments have distinct goals to aid in the control, containment, and eradication of HPAI in poultry. For more information on the zone, area, and premises designations referred to in this section, please refer to [Section 5.5](#) in this chapter.

1. *The initial 72 hours post-HPAI outbreak declaration.* The objective is to detect existing infected flocks and premises as quickly as possible. During this period, the goals of IC are to:
 - a. Create the initial BZ designation and the boundary of the CA.

-
- b. Create a list of premises with susceptible flocks (and species) in the CA.
 - c. Determine the boundary of the Surveillance Zone (SZ), which is located in the Free Area (FA), and start developing a surveillance plan to be used in the SZ.
 2. *The control period (from initial 72-hour period until last case is detected and depopulated).* Four key objectives need to be accomplished simultaneously in this period.
 - a. Detect IP, new and existing, so that control measures can be immediately implemented.
 - b. Provide evidence that premises are free of HPAI, thereby permitting poultry and poultry product movements within and out of the CA.
 - c. Evaluate the outbreak management control activities.
 - d. Provide evidence that the FA is free of disease, thereby enabling unrestricted poultry and poultry product movement.
 3. *Eradication to freedom.* When new detections cease, the objective is to provide evidence that the CA and FA are free of disease (consistent with OIE recommendations and requirements on surveillance).
 - a. Provide evidence of DF on depopulated premises.
 - b. Provide evidence of DF on premises in the CA by random sampling or targeted sampling (choosing populations based on risk) on selected premises and selected flocks.
 - c. Provide evidence of DF in the FA, following OIE guidelines, using multiple methods which may include serological slaughter sampling and passive surveillance by veterinarians and the public.

5.3.2 Surveillance Sampling

The ultimate goal of surveillance sampling is to detect HPAI in poultry as soon as possible. Once an HPAI outbreak response has been authorized, surveillance sampling schemes are drafted for the sampling and monitoring of premises, both for continuity of business and for disease detection.

For more information on surveillance and sampling schemes for business continuity movements, please refer to the Secure Food Supply Plans. These include the Secure Turkey Supply (www.secureturkeysupply.com), Secure Broiler Supply (www.securebroilersupply.com), and the Secure Egg Supply (www.secureeggssupply.com). These plans provide information on the diagnostic

testing required for movement during an HPAI outbreak. [Appendix C](#) also provides more information on the Secure Egg Supply Plan.

Surveillance sampling, using appropriate disease detection sampling schemes, begins immediately after outbreak response has been authorized. The sampling unit and sample shown in Box 5-2 should be used in all surveillance schemes for the IZ, BZ, and SZ, for both commercial and backyard premises. [Appendix D](#) also provides more information on the rationale behind surveillance sampling.

Box 5-2. Sampling Unit and Sample Measures for HPAI Surveillance

Sampling Unit and Sample Measures for HPAI Surveillance

- **Sampling Unit:** Flock or house.
- **Sample:** A pooled sample that combines swabs taken from 5 or 11 dead or euthanized sick birds out of the house's (flock's) daily dead or ill birds.

These sampling measures are defined as:

- **Dead Birds:** The dead or euthanized sick birds found each day in every house (flock) on a premises.
- **50-Dead-Bird Group:** Consists of 50 or fewer dead birds (and each multiple of 50 or fewer dead birds) from each house on the premises each day.
- **5-Bird (or 11-Bird) Pool:** Combines samples taken from five dead or euthanized sick birds out of the house's (flock's) daily dead birds into one sample. In all cases where a 5-bird pool is mentioned, an 11-bird pool (samples taken from 11 dead or euthanized sick birds) may be collected instead. This is an additional option for sampling.
- **Detection Probability:** The sampling scheme will detect at least 1 infected bird in each 50-dead-bird group (at the 95 percent confidence level) if there are 20 or more infected birds (40 percent prevalence) in the target population of daily dead birds, where the rRT-PCR test sensitivity of the 5-bird pool is 86.5 percent.

5.3.3 Surveillance Schemes Based on Zone

An outbreak surveillance plan has specific outbreak surveillance schemes for each zone (such as the IZ, BZ, and SZ). Example sampling frequencies are provided in [Appendix D](#). For example, a surveillance plan for the sampling frequency for commercial CP and Monitored Premises (MP) in the IZ would be to collect a 5-bird (or 11-bird) pooled sample every other day for 14 days. A comparable sampling scheme based on the recommendations of IC would also be appropriate, particularly given the resources available. These schemes may need to be adjusted to an outbreak situation. ([Appendix D](#) contains complete information on sampling schemes for the IZ, BZ, and SZ for both commercial and backyard premises.)

For proof of DF, following OIE recommendations for increased surveillance, surveillance starts 21 days after depopulation of the last IP. Surveillance inside the CA may be intensified by

- ◆ increasing the frequency of testing as stated in the NPIP,
- ◆ active investigation of flocks with suspicious clinical signs,
- ◆ increasing slaughter sero-surveillance, and
- ◆ possible use of additional sentinel flocks.

Surveillance is conducted in both the CA(s) and FA. Active investigation of suspect disease cases augments the surveillance scheme. (Chapter 6 and Appendix D contain additional information on proof of DF.)

The *HPAI Surveillance SOP* provides additional information on the protocol for a response surveillance team responding to HPAI IP, the distinction between commercial and backyard premises surveillance, and equipment checklists. The Outbreak Surveillance Toolbox, available to people with access to the Inside APHIS webpage, also provides more surveillance tools: <http://inside.aphis.usda.gov/vs/ceah/nsu/toolbox/>. If you do not have access to the Inside APHIS webpage, but would like to access the Toolbox, please e-mail FAD.PReP.Comments@aphis.usda.gov.

5.4 DIAGNOSTICS

Effective and appropriate sample collection, diagnostic testing, surge capacity, and reporting are critical in an effective HPAI response. These activities require additional resources in the event of an HPAI outbreak. In particular, flock sampling requires additional personnel. Surge capacity may also be required for diagnostic laboratory testing. Surveillance plan requirements must be fully integrated with current diagnostic sample collection, sample testing, surge capacity, and reporting capabilities.

During a suspected or actual HPAI outbreak, the key goals of response are to (1) meet the surge requirements for diagnostic testing at specific intervals, starting at time zero and at 24-hour intervals as the response escalates and (2) report all diagnostic test results to appropriate personnel *and* information management systems as soon as possible and within 4 hours of diagnostic test completion.

The *FAD Investigation Manual* (FAD PReP Manual 4-0) offers detailed information on diagnostic sample collection, diagnostic testing, and reporting. This document provides guidance on who is responsible for diagnostic testing, sample packaging and shipping, and roles in FAD investigations. Appendix E references *VS Guidance Document 12001* for FAD investigations, and provides the associated ready reference guide. The procedures outlined in this document

should be followed in all FAD investigations, including those in which HPAI is a differential diagnosis. Information on how to package and label laboratory submissions is also available [here](#).

5.4.1 Sample Collection and Diagnostic Testing

Trained personnel and field collection kits are required to effectively collect samples from poultry. AI may be presumptively diagnosed on the basis of clinical signs, a sudden and significant increase in mortality, a decrease in egg production, or gross or microscopic pathologic lesions in combination with laboratory diagnostic tests. The rRT-PCR is typically used for early detection of HPAI because test results can be produced in 4–7 hours. Other types of samples may be required if infection is suspected in species other than poultry.

Confirmatory tests are more specific and used to verify the presence of AI, identify specific viral subtypes, and evaluate pathogenicity. Partial gene sequencing using Sanger technology has allowed more rapid confirmation of subtype and pathotype (determination of LPAI or HPAI) where sufficient viral RNA is present in the samples (~10 hours to conduct partial HA/NA sequencing). Other definitive tests such as isolating the virus in embryonated chicken eggs and whole genome sequencing can take 5–10 days per procedure. It is typically advantageous to respond to an H5 or H7 presumptive PCR result—in accordance with the case definition—to facilitate the rapid initiation of control and eradication activities.

The confirmation of an HPAI outbreak is made by NVSL-Ames. After positive confirmation of HPAI, subsequent samples from premises inside the established CA may be sent to approved laboratories that are part of the NAHLN ([Appendix B](#) lists NAHLN laboratories approved for HPAI testing).

The following sections describe the diagnostic tests performed when HPAI is suspected (e.g., an FAD investigation) in Figure 5-1 and when it has been confirmed in the United States in Figure 5-2. Table 5-1 provides the corresponding legend for these figures.

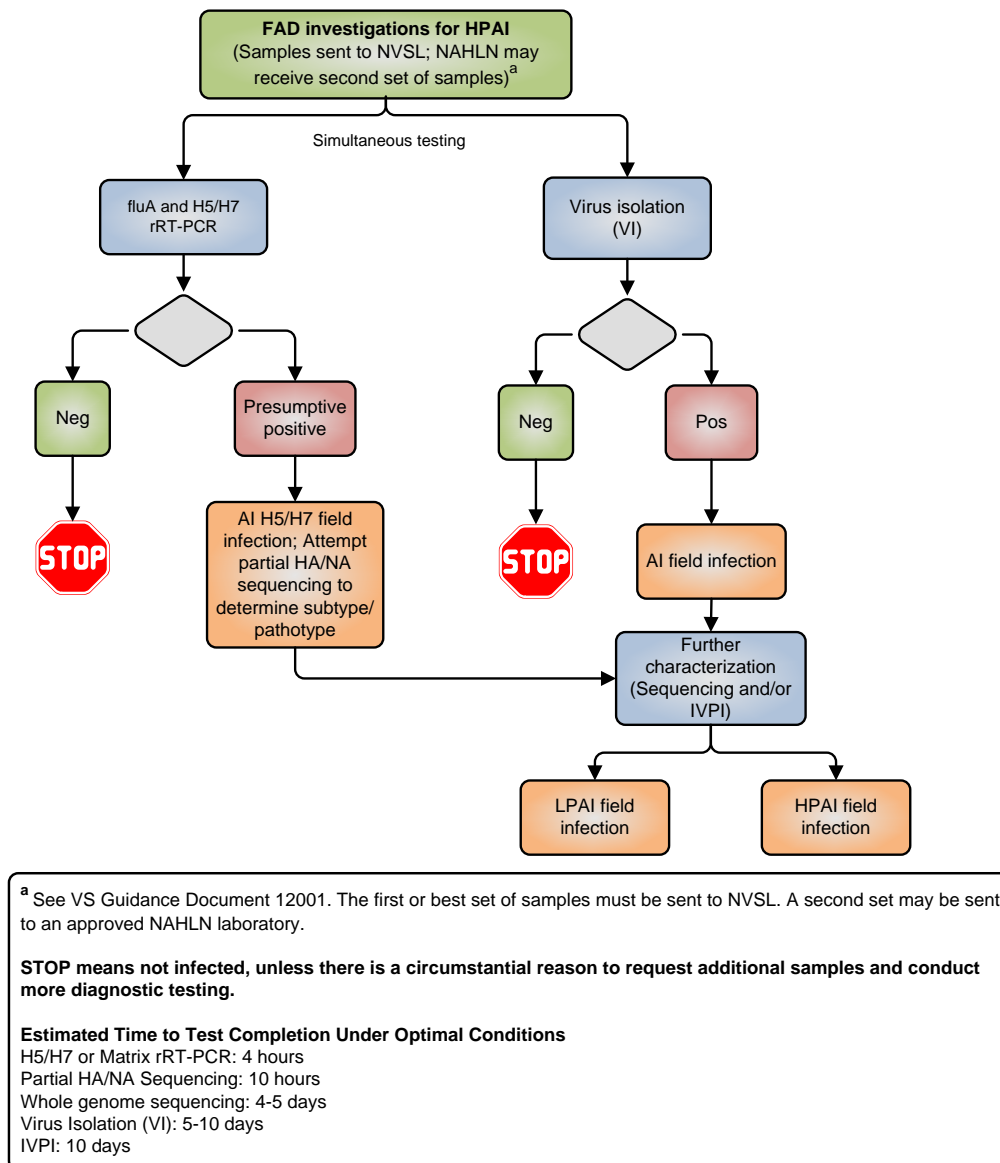
Table 5-1. Abbreviations for Diagnostic Figures

Abbreviation	Definition
fluA	influenza A virus
IVPI	intravenous pathogenicity index
rRT-PCR	real-time reverse transcriptase polymerase chain reaction
VI	virus isolation

5.4.1.1 DIAGNOSTICS FOR INITIAL HPAI DETECTION

Figure 5-1 illustrates the typical diagnostic flow for a suspected case of HPAI via an FAD investigation. For the diagnostic flow after an initial detection, or during an outbreak, see Figure 5-2. Confirmation of HPAI is only made at NVSL-Ames.

Figure 5-1. Diagnostic Flow for FAD Investigations of Suspected HPAI

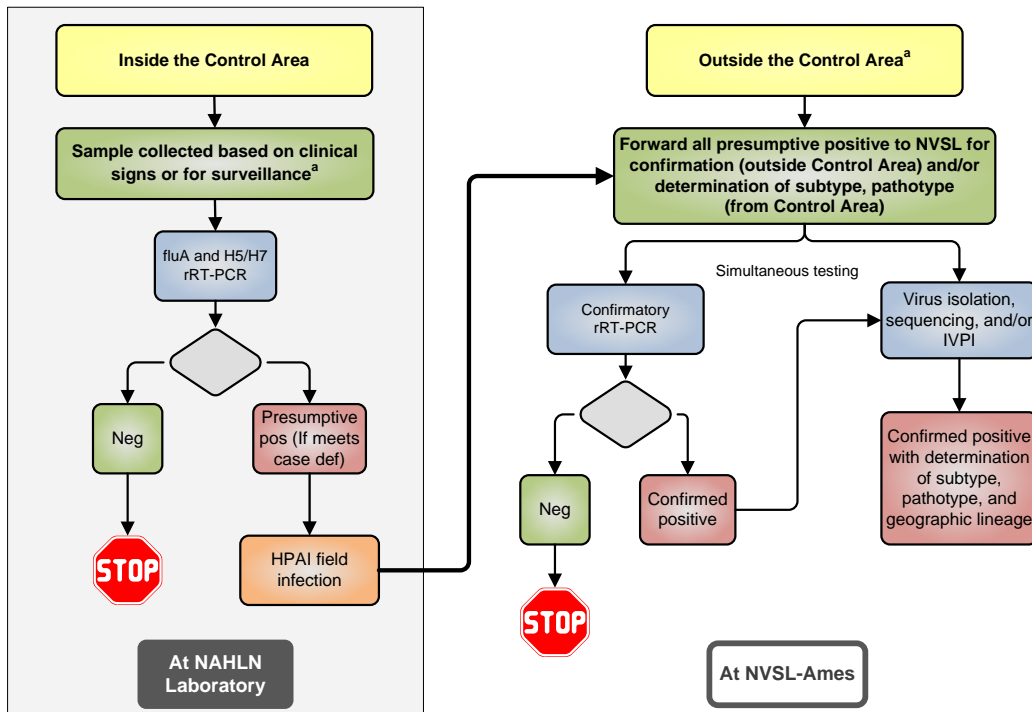


5.4.1.2 DIAGNOSTICS AFTER HPAI DETECTION

Figure 5-2 illustrates the diagnostic flow after HPAI has been detected; this is after NVSL-Ames has confirmed HPAI on an index premises. IC provides specific instructions regarding the direction and collection of samples, which is likely to change as the outbreak changes in size or scope.

In all cases, (1) NVSL confirms the index case, (2) presumptive positive samples based upon rRT-PCR results from outside an established CA are tested and confirmed by NVSL, and (3) NVSL receives samples routinely from *inside* the CA to monitor for changes in the HPAI virus. Based on the recommendation of the IC and ICG, *all* presumptive positive samples from NAHLN laboratories may be forwarded to NVSL for confirmation and subtyping.

Figure 5-2. Diagnostic Flow During an HPAI Outbreak



^a See VS Guidance Document 12001. The first or best set of samples must be sent to NVSL. A second set may be sent to an approved NAHLN laboratory.

STOP means not infected, unless there is a circumstantial reason to request additional samples and conduct more diagnostic testing.

Estimated Time to Test Completion Under Optimal Conditions

H5/H7 or Matrix rRT-PCR: 4 hours
 Partial HA/NA Sequencing: 10 hours
 Whole genome sequencing: 4-5 days
 Virus Isolation (VI): 5-10 days
 IVPI: 10 days

5.4.2 Surge Capacity

Surge capacity may be needed in an HPAI outbreak. Additional resources, such as personnel and materials, will be needed for sample collection. Additional capacity may also be required for laboratory sample testing. Surge capacity can help to ensure a rapid response and continuity of business for uninfected premises. In the event that the State NAHLN laboratory and NVSL-Ames are overwhelmed by the diagnostic testing requirements, NAHLN labs from neighboring States will provide surge capacity for diagnostic testing. For more information on surge

capacity, please see the NAHLN Activation Guide. Individual laboratories have independent protocols on how to manage personnel if a surge is required. [Appendix B](#) contains a list of the NAHLN labs approved to conduct HPAI diagnostics.

5.4.3 Reporting

Box 5-3 clarifies reporting and notification of HPAI. See *VS Guidance Document 12001* and the *FAD Investigation Manual* (FAD PReP Manual 4-0) for further information on HPAI investigation and reporting. This document and a link to this manual are available at www.aphis.usda.gov/fadprep. *VS Guidance Document 8602* also provides information on reporting relating to HPAI in domestic poultry.

Box 5-3. Reporting and Notification

Reporting and Notification

- Cases considered a presumptive positive for HPAI, based on the current case definition, are reported to the affected States, other States, Tribal nations, industry, other Federal agencies, trading partners, and the OIE.
- This includes breeder and commercial poultry flocks, domestic waterfowl and upland game birds, backyard flocks, and LBMS.
- Appropriate Federal-State-Tribal-industry response and containment measures are initiated during HPAI investigations.

5.5 EPIDEMIOLOGICAL INVESTIGATION AND TRACING

5.5.1 Summary of Zones, Areas, and Premises Designations

A critical component of an HPAI response is the designation of zones, areas, and premises. The Incident Commander works with the Operations Section and Planning Section to (1) determine appropriate zones, areas, and premises designations in the event of an HPAI outbreak and (2) reevaluate these designations as needed throughout the outbreak based on the epidemiological situation. These zones, areas, and premises designations are used in quarantine and movement control efforts. For details on the zones, areas, and premises, please see the *APHIS Foreign Animal Disease Framework: Response Strategies* (FAD PReP Manual 2-0).

Table 5-2 summarizes the premises designations that are employed in an HPAI outbreak response. Table 5-3 summarizes the zone and area designations that

would be used in an HPAI outbreak response. Figure 5-3 illustrates these premises, zone, and area designations.

Table 5-2. Summary of Premises Designations

Premises	Definition	Zone
Infected Premises (IP)	Premises where a presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, HPAI case definition, and international standards.	Infected Zone
Contact Premises (CP)	Premises with susceptible animals that may have been exposed to HPAI, either directly or indirectly, including but not limited to exposure to animals, animal products, fomites, or people from Infected Premises.	Infected Zone, Buffer Zone
Suspect Premises (SP)	Premises under investigation due to the presence of susceptible animals reported to have clinical signs compatible with HPAI. This is intended to be a short-term premises designation.	Infected Zone, Buffer Zone, Surveillance Zone, Vaccination Zone
At-Risk Premises (ARP)	Premises with susceptible animals, but none of those susceptible animals have clinical signs compatible with HPAI. Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises. At-Risk Premises seek to move susceptible animals or products within the Control Area by permit. Only At-Risk Premises are eligible to become Monitored Premises.	Infected Zone, Buffer Zone
Monitored Premises (MP)	Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises. Only At-Risk Premises are eligible to become Monitored Premises. Monitored Premises meet a set of defined criteria in seeking to move susceptible animals or products out of the Control Area by permit.	Infected Zone, Buffer Zone
Free Premises (FP)	Premises outside of a Control Area and not a Contact or Suspect Premises.	Surveillance Zone, Free Area
Vaccinated Premises (VP)	Premises where emergency vaccination has been performed. This may be a secondary premises designation.	Containment Vaccination Zone, Protection Vaccination Zone

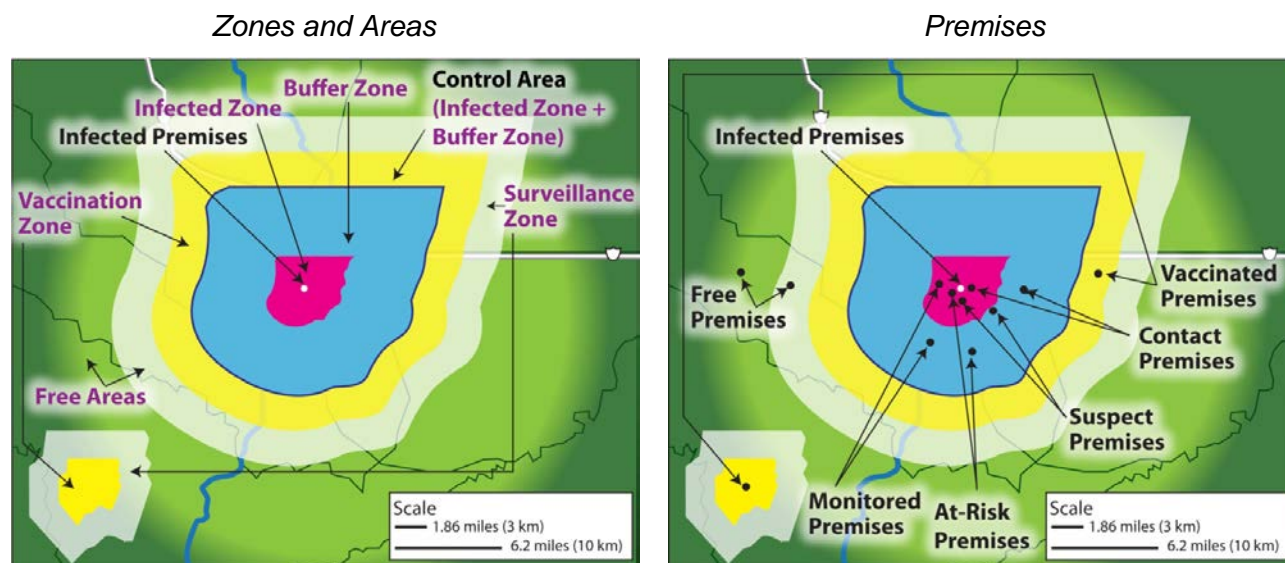
Table 5-3. Summary of Zone and Area Designations

Zone/Area	Definition
Infected Zone (IZ)	Zone that immediately surrounds an Infected Premises.
Buffer Zone (BZ)	Zone that immediately surrounds an Infected Zone or a Contact Premises.
Control Area (CA)	Consists of an Infected Zone and a Buffer Zone.
Surveillance Zone (SZ)	Zone outside and along the border of a Control Area. The Surveillance Zone is part of the Free Area.
Free Area (FA)	Area not included in any Control Area. Includes the Surveillance Zone.

Table 5-3. Summary of Zone and Area Designations

Zone/Area	Definition
Vaccination Zone (VZ)	Emergency Vaccination Zone classified as either a Containment Vaccination Zone (typically inside a Control Area) or a Protection Vaccination Zone (typically outside a Control Area). This may be a secondary zone designation.

Figure 5-3. Example of Zones, Areas, and Premises in HPAI Outbreak Response



Note: The Vaccination Zone can be either a Protection Vaccination Zone or Containment Vaccination Zone. Stamping-out is not pictured in these figures. The Surveillance Zone is part of the Free Area.



5.5.2 Epidemiological Investigation

Epidemiological investigation and movement tracing during an outbreak are critical in controlling and eradicating HPAI in poultry. In an HPAI outbreak, the goals are to

- ◆ within 96 hours of identifying the index case, characterize the nature of the HPAI outbreak, identify the risk factors for transmission, and develop mitigation strategies;
- ◆ within 6 hours of identifying potential IP or CP through tracing activities, assign a premises classification and a priority of investigation; and
- ◆ within 24 hours of identifying the IP or initial CP, identify all additional CP.

These measures aid in the control of HPAI and lessen the impact during the response effort. [Appendix F](#) provides two documents: (1) an epidemiological questionnaire used in turkey flocks in the recent HPAI outbreak, and (2) a case-control questionnaire used in layer flocks in the recent HPAI outbreak.

The scope of any such questionnaire should be based on the circumstances of the outbreak, and is at the discretion of the IC and epidemiological subject matter experts. The *Epidemiological Investigation and Tracing SOP* as well as the *NAHEMS Guidelines: Surveillance, Epidemiology, and Tracing* both provide more information.

5.5.3 Tracing

Box 5-4 explains the fundamental importance of movement tracing in an HPAI response effort.

Box 5-4. Importance of Movement Tracing in HPAI Outbreak

Tracing

One of the single most important and urgent veterinary activities during an HPAI outbreak is to rapidly and diligently trace-back and trace-forward movements from an IP. This tracing aids in the control of the spread of HPAI virus and limit the impact of the outbreak. Tracing should cover all movements from the premises, including susceptible poultry and livestock, non-susceptible species, animal products, vehicles, crops and grains, and people. Tracing also includes consideration of all potential modes of transmission and possible contact with wild birds.

Trace-back and trace-forward information should ideally be collected for at least 14–21 days before the appearance of clinical signs in poultry infected with HPAI. Additional tracing information is collected for movements up to the time that quarantine was imposed.

Tracing information is obtained from many sources (such as reports from field veterinarians, producers, industry, farm service providers, or the public). The EMRS is used to collect and report tracing information; tracing information must be entered routinely, and ideally at 24-hour intervals or less.

5.5.4 Considerations for Size of Control Area and Minimum Sizes of Other Zones

The perimeter of the CA should be at least 10 km (~6.21 miles) beyond the perimeter of the closest IP. The size of the CA depends on the circumstances of the outbreak, including the IP transmission pathways and estimates of transmission risk, poultry movement patterns and concentrations, distribution of susceptible wildlife in proximity, natural terrain, jurisdictional boundaries, and

other factors. The boundaries of the CA can be modified or redefined when tracing and other epidemiological information becomes available.

Table 5-4 provides a description of the minimum sizes of areas and zones. Table 5-5 reviews the factors used to determine the size of the CA.

Table 5-4. Minimum Sizes of Areas and Zones

Zone or Area	Minimum Size and Details
Infected Zone (IZ)	Perimeter should be at least 3 km (~1.86 miles) beyond perimeters of presumptive or confirmed Infected Premises. Will depend on disease agent and epidemiological circumstances. This zone may be redefined as the outbreak continues.
Buffer Zone (BZ)	Perimeter should be at least 7 km (~4.35 miles) beyond the perimeter of the Infected Zone. Width is generally not less than the minimum radius of the associated Infected Zone, but may be much larger. This zone may be redefined as the outbreak continues.
Control Area (CA)	Perimeter should be at least 10 km (~6.21 miles) beyond the perimeter of the closest Infected Premises. Please see Table 5-5 for factors that influence the size of the Control Area. This area may be redefined as the outbreak continues.
Surveillance Zone (SZ)	Width should be at least 10 km (~6.21 miles), but may be much larger.

Table 5-5. Factors To Consider in Determining Control Area Size for HPAI

Factors	Additional Details
Jurisdictional areas	<ul style="list-style-type: none"> ◆ Effectiveness and efficiency of administration ◆ Multi-jurisdictional considerations: local, State, Tribal, and multistate
Physical boundaries	<ul style="list-style-type: none"> ◆ Areas defined by geography ◆ Areas defined by distance between premises
HPAI epidemiology	<ul style="list-style-type: none"> ◆ Reproductive rate ◆ Incubation period ◆ Ease of transmission ◆ Infectious dose ◆ Species susceptibility ◆ Modes of transmission (fecal-oral, droplet, aerosol, vectors) ◆ Survivability in the environment ◆ Ease of diagnosis (for example, no pathognomonic signs; requires diagnostic laboratory testing)
Infected Premises characteristics	<ul style="list-style-type: none"> ◆ Number of contacts ◆ Transmission pathways and transmission risk <ul style="list-style-type: none"> ▪ Extent of animal movement ▪ Number of animals ▪ Species of animals ▪ Age of animals ▪ Movement of traffic and personnel to and from premises (fomite spread) ▪ Biosecurity measures in place at time of outbreak

Table 5-5. Factors To Consider in Determining Control Area Size for HPAI

Factors	Additional Details
Contact Premises characteristics	<ul style="list-style-type: none"> ◆ Number and types of premises ◆ Susceptible animal populations and population density ◆ Animal movements ◆ Movement of traffic (fomites) and personnel to and from premises (fomite spread) ◆ Biosecurity measures in place prior to outbreak
Environment	<ul style="list-style-type: none"> ◆ Types of premises in area or region ◆ Land use in area or region ◆ Susceptible wildlife and population density ◆ Wildlife as biological or mechanical vectors
General area, region, or agricultural sector biosecurity	<ul style="list-style-type: none"> ◆ Biosecurity practices in place prior to outbreak ◆ Biosecurity practices implemented once outbreak detected
Number of backyard or transitional premises	<ul style="list-style-type: none"> ◆ Types of premises, animal movements, and network of animal and fomite movements
Continuity of business	<ul style="list-style-type: none"> ◆ Continuity of business plans and processes in place or activated at beginning of outbreak (such as surveillance, negative diagnostic tests, premises biosecurity, and risk-assessments) ◆ Permit processes, memorandums of understanding, and information management systems in place or activated at beginning of outbreak

5.6 INFORMATION MANAGEMENT

Federal, State, Tribal and local information management systems need to be compatible for information and data sharing. In an HPAI outbreak, the goal is to have EMRS data entry processes performed in 12-hour or shorter intervals. Data should be entered as quickly as possible. EMRS is the official system of record for information in an HPAI outbreak, and contains data on IP, permits (including for continuity of business activities), movements, and traces, among other information. This data is used for general daily and weekly situation reports as well as more specific reporting needs.

Field personnel should be provided with access to mobile technology devices necessary for collecting, monitoring, and sharing information. Rapidly functional, robust, and scalable information technology infrastructure is needed in an HPAI outbreak.

It is imperative in an HPAI outbreak that information management, data quality, and data integrity is a priority. In some situations, or where field resources are constrained or overtasked, some or all data entry into EMRS may be centralized to facilitate rapid reporting up the chain of command. In order for information to be useful at all levels, it is important to ensure that data is entered in both a timely and consistent manner across widespread field operations.

The *NAHEMS Guidelines: Information Management* provides additional information on key VS systems, including the following:

- ◆ EMRS 2.0,
- ◆ Surveillance Collaboration Services,
- ◆ Animal Health and Surveillance Management,
- ◆ Laboratory Messaging System,
- ◆ Animal Disease Traceability Information System,
- ◆ and others.

As necessary, these systems interface with EMRS 2.0 (i.e., laboratory results are messaged to EMRS). Additional development of data-sharing capabilities continues. This *NAHEMS Guidelines* also covers the following APHIS information technology systems:

- ◆ APHIS Emergency Qualifications System, and
- ◆ Resource Ordering and Status System (ROSS).

ROSS is an important system that is used for requesting, deploying, and tracking personnel deployments and assignments during an outbreak.

5.7 COMMUNICATION

The *HPAI Communications SOP* provides guidance on communications activities during an HPAI outbreak, covering the responsibilities of personnel and internal and external communication procedures. APHIS Legislative and Public Affairs (LPA) serves as the primary liaison with the news media in the event of an HPAI outbreak. Under the ICS, a JIC is established. During an HPAI outbreak, APHIS LPA and the USDA Office of Communications staff the JIC.

Effective communication during an HPAI outbreak may be carried out and maintained by

- ◆ establishing a network of stakeholders and systems for communication prior to an incident or outbreak;
- ◆ briefing the media, public, industry, Congress, trading partners, and others on the HPAI outbreak status and the actions being taken to control and eradicate the disease;
- ◆ coordinating with Federal, State, and local agencies, Tribal entities, producer groups, and Land Grant University-based Cooperative Extension

Services to ensure consistent messaging regarding animal health, public health, and food safety; and

- ◆ assuring consumers that USDA is working on animal health issues, in an informed and timely manner, along with HHS, which is working on human health issues.

In addition, all communications should highlight the importance of sound biosecurity measures and steps that producers and owners can take to protect against HPAI infection in their own flocks.

5.7.1 Objectives

All HPAI communications must

- ◆ furnish accurate, timely, and consistent information;
- ◆ maintain credibility and instill public confidence in the government's ability to respond to an outbreak;
- ◆ minimize public panic and fear; and
- ◆ address rumors, inaccuracies, and misperceptions as quickly as possible.

5.7.2 Key Messages

Five key messages are conveyed in an HPAI outbreak (Box 5-5).

Box 5-5. HPAI Communication Messages

Key Communication Messages

Four key messages are conveyed to the public:

1. This detection does not signal the start of a human flu pandemic.
2. We are responding quickly and decisively to eradicate the virus.
3. Properly prepared eggs and poultry are safe to eat.
4. We are safeguarding the food supply.

An additional key message is conveyed to producers:

Protect your flocks with good biosecurity practices and be vigilant in reporting signs of illness.

5.7.3 Further Communications Guidance

In addition to the *HPAI Communications SOP*, the following resources provide guidance on communication and information about various stakeholder groups:

-
- ◆ USDA AI website: www.usda.gov/birdflu.
 - ◆ APHIS AI website: [here](#).
 - ◆ A Partial Listing of FAD Stakeholders: www.aphis.usda.gov/animal_health/emergency_management/downloads/documents_manuals/fad_stakeholders_par_list.pdf.
 - ◆ CDC website on AI: <http://www.cdc.gov/flu/avianflu/>.
 - ◆ For information on the safe handling of poultry and poultry products, please see: www.fsis.usda.gov/wps/portal/fsis/topics/food-safety-education/get-answers/food-safety-fact-sheets/poultry-preparation or www.foodsafety.gov.

5.8 HEALTH AND SAFETY AND PERSONAL PROTECTIVE EQUIPMENT

During an HPAI outbreak, responders are exposed to many hazards. Taking precautions to prevent adverse human health events related to emergency response efforts is important. In an HPAI response, personal protection and safety is particularly essential to protect individuals from HPAI. Even if there have been no documented human infections with the field strain of the 2014–2015 outbreak, all strains of HPAI should be treated as potentially zoonotic. Typically, those at increased risk for HPAI infection are personnel in prolonged and direct contact with infected birds in an enclosed setting.

Upon the confirmation of HPAI, public health authorities should implement appropriate public health measures, including observation, prevention, and case management (as required). APHIS works closely with public health authorities in a response. Unvaccinated responders are highly encouraged to immediately receive the current season's inactivated influenza virus vaccine to reduce the possibility of dual infection with avian and human influenza A viruses and potential genetic reassortment.

Personal protective equipment (PPE) is fundamental in ensuring personnel are protected from HPAI, as well as other hazards. Disposable or reusable outwear may be acceptable, and all workers involved in the depopulation, transport, or disposal of HPAI virus-infected poultry must be provided with appropriate PPE. All visitors and employees, regardless of their exposure, should be provided with disposable coveralls, boots, hats, and gloves for their use before entering premises. Disposal of this PPE is required after leaving.

For further information on health, safety, and PPE, see the *HPAI Health and Safety and PPE SOP*. This SOP provides information on best practices to ensure

the well-being and safety of all individuals involved in the response effort. Specific topics covered include the following:

- ◆ Procedures to create a site-specific health and safety plan;
- ◆ Details of hazard analysis, necessary training, and medical surveillance requirements;
- ◆ PPE, including Occupational Safety and Health Administration respirator fit testing;
- ◆ Pre-deployment information and guidance; and
- ◆ A protocol for staff field safety in an HPAI response.

5.8.1 Mental Health Concerns

The health and safety of all personnel is affected by the mental state of those involved in the HPAI response effort. An HPAI outbreak could have a significant psychological effect on both responders and owners of affected poultry. Quarantine and movement restrictions may also impact the mental health in populations affected by such controls. Care should be taken in the event of an HPAI outbreak to consider and provide provisions for such psychological effects. Incident Commanders should encourage reporting of such concerns; Safety and Health Officers assigned to ICPs are a key resource for personnel. HHS has developed resources specifically for emergency and disaster responders, State and local planners, health professionals, and the general public (www.bt.cdc.gov/mentalhealth/).

5.8.2 Further Information on Health, Safety, and Personal Protective Equipment

In addition to the resources already listed, more information and guidance can be found in the following documents.

- ◆ *APHIS Health and Safety Plan*
- ◆ APHIS Directive 6800.1, *Ensuring the Protection of Employees Involved in Highly Pathogenic Avian Influenza Control and Eradication Activities*: www.aphis.usda.gov/library/directives/pdf/APHIS6800_1.pdf
- ◆ CDC website on AI: www.cdc.gov/flu/avianflu/
- ◆ *NAHEMS Guidelines: Health and Safety*
- ◆ *NAHEMS Guidelines: Personal Protective Equipment*

-
- ◆ Incident-specific guidance, including PPE recommendations and health and safety guidance, are located at www.aphis.usda.gov/fadprep.

5.9 BIOSECURITY

An HPAI outbreak will have a serious impact on the agricultural industry, and could also impact public health. Strict biosecurity measures need to be implemented immediately (and ideally before an outbreak) to prevent or slow the spread of HPAI. Biosecurity procedures should be implemented within 24 hours of the identification of an index HPAI case. Accordingly, veterinarians, owners, and anyone else in contact with enterprises that have poultry or other susceptible species need to observe biosecurity measures.

Proper biosecurity measures have two functions: (1) containing the virus on IP (biocontainment) and (2) preventing the introduction of the virus via movement of personnel and material to naïve poultry and premises (bioexclusion). During an HPAI outbreak, a careful balance must be maintained between facilitating response activities and ensuring personnel do not expose naïve animals and premises to HPAI.

In the 2014–2015 HPAI outbreak in the United States, biosecurity breaches and inadequately implemented biosecurity measures were cited as one of multiple potential reasons for widespread HPAI transmission in the Midwest. Biosecurity is of utmost importance in controlling and containing the virus.

Further information on biosecurity is discussed in the *HPAI Biosecurity SOP* which provides guidance on how to draft a site-specific biosecurity plan and

- ◆ identifies the roles and responsibilities of key personnel,
- ◆ explains biosecurity training and briefing requirements,
- ◆ addresses site security and safety,
- ◆ discusses biosecurity practices for shipping and transportation, and
- ◆ provides a biosecurity checklist.

In addition to the *HPAI Biosecurity SOP*, information and guidance on appropriate biosecurity measures in an HPAI outbreak can be found in the *NAHEMS Guidelines: Biosecurity*.

5.9.1 Biosecurity as Related to Health and Safety

Health and safety of personnel is always the first priority. In outbreaks with zoonotic potential, such as HPAI, appropriate PPE is provided to persons involved in outbreak control and eradication as an additional biosecurity measure.

For more information on health, safety, and PPE, see [Section 5.8](#). USDA APHIS coordinates with public health agencies to minimize risk to responders and others exposed to HPAI.

5.9.2 Biosecurity Hazards and Mitigating Measures

Box 5-6 shows biosecurity hazards and biosecurity measures to mitigate these risks during an HPAI outbreak.

Box 5-6. HPAI Biosecurity Hazards and Appropriate Biosecurity Measures

Biosecurity Hazards	Biosecurity Measures to Mitigate Risk
<ul style="list-style-type: none"> • Movement of poultry, other livestock, vehicles, equipment, and people. • Contaminated feed and water. • Contact with poultry and other HPAI-susceptible animals. 	<ul style="list-style-type: none"> • Clean and disinfect premises, vehicles, and equipment, and dispose of materials that cannot be disinfected in an appropriate manner. • Account for the movement of all poultry, livestock, and equipment for accurate records. • Provide a location for all individuals to carry out appropriate cleaning and disinfection procedures and insist these measures be followed. • Ensure that housed poultry remain housed and that entry of rodents, ground water, and wild birds is prevented. • Prevent close or direct contact between poultry and other species reared outside.

In some cases, responders may own poultry or birds at their residence. Incident Commanders should be aware of this possibility, and if personnel are traveling between their residence and their assigned location each day, this risk needs to be immediately mitigated. IC will recommend appropriate measures, which may include avoiding contact with their own poultry for the duration of deployment or being assigned to the ICP for other activities that do not involve contact with infected birds or material. Personnel are urged to protect their own flocks from HPAI.

5.9.3 Closed Flocks

In the event of an HPAI outbreak, one of the most fundamental biosecurity measures is closed flocks. Box 5-7 provides guidance on employing closed flocks as a critical biosecurity measure.

Box 5-7. Biosecurity Measure—Closed Flocks

Biosecurity: Closed Flocks

- To the fullest extent possible, close the flock or herd to the introduction of new poultry and other livestock (with population increases occurring only from offspring).
- If closing a flock is not possible, isolate newly introduced poultry (from the healthiest possible sources) and those returning from existing flocks or herds for 30 days or more.
- Vaccination status of introduced poultry should be known and well-documented.

5.9.4 Waiting Period

Another important biosecurity measure is to ensure personnel are not travelling between IP and unknown or uninfected premises. During an HPAI outbreak, it is important that personnel—in addition to following strict and appropriate biosecurity and cleaning and disinfection protocols—wait the allotted time between premises visits. *Actual waiting periods are recommended by IC on the basis of the outbreak circumstances, and need for personnel.* Typical waiting times may vary between 12 and 72 hours. Regardless of wait time, team members should not travel directly from an IP or SP to an unknown or uninfected premises. However, personnel may travel *between* IP, if proper mitigating procedures are followed. Extended avoidance periods may be unnecessary with stringent biosecurity practices and effective cleaning and disinfection protocols.

Responding veterinarians and other personnel should adhere to the guidance provided by the local IC; it is critical to remember that any real or perceived belief that responders are spreading HPAI is incredibly detrimental to the response effort. For example, when and where possible, responders may be able to avoid the need to enter premises that are not infected and interact with unaffected poultry by meeting producers at the end of their driveway.

5.10 QUARANTINE AND MOVEMENT CONTROL

By restricting the movement of infected animals, animal products, and contaminated fomites, quarantine and movement control can be a powerful tool in controlling and eradicating an HPAI outbreak. Movement control is accomplished through a permit system that allows entities to make necessary movements without creating an unacceptable risk of disease spread. EMRS is the system of record for these movements. Movement control procedures are based on the best scientific information available at the time, and all personnel—premises owners, managers, and responders—should adhere to these measures.

When HPAI is detected, SAHOs and Tribal officials issue a quarantine, hold order, or standstill notice for the IP based on the authority and regulations of the

affected State. This action is based on the authority and regulations of the affected State, and varies by State. Within 6 hours of the identification of the index case, the Incident Commander, Operations Section, and Planning Section in a Unified State-Federal IC coordinate to establish an IZ and a BZ (a CA). Once the CA (IZ plus BZ) is established, quarantine and movement controls are implemented by the Unified IC. [Appendix G](#) contains examples of movement control notices.

Each State's animal health emergency response plan should describe the implementation of quarantine and movement controls. In some cases, USDA may impose a Federal quarantine (under the AHPA and CFR authorities) when requested by SAHOs or as directed by the Secretary of Agriculture to restrict interstate commerce from the infected States. States may be asked to provide resources to maintain and enforce the quarantine; reimbursement formulas for these activities would be established between the States and USDA in a cooperative agreement. Federal quarantines may not always be issued. See *Foreign Animal Disease Framework: Roles and Coordination* (FAD PRoP Manual 1-0) for further information on authorities and funding.

The *NAHEMS Guidelines: Quarantine and Movement Control* provides information on measures considered necessary to prevent the spread of HPAI through movement, including (1) keeping HPAI out of poultry populations in areas free of HPAI and (2) preventing the spread of HPAI to non-infected poultry in areas where HPAI exists.


5.10.1 Zones, Areas, and Premises Designations

In addition to working to establish the boundaries of the CA, the Incident Commander works with the Operations Section and Planning Section to determine appropriate premises designations in the event of an HPAI outbreak. These zone, area, and premises designations are used for quarantine and movement control efforts. Again, refer to Tables 5-2 and 5-3 and Figure 5-3 for the designations used here.

5.10.2 Movement Guidance into, within, and out of a Control Area

During an HPAI outbreak, the following guidance in Table 5-6 (movement into a CA), Table 5-7 (movement within a CA), and Table 5-8 (movement out of a CA) is used to issue permits in movement control efforts. For information on permit guidance for turkeys, broilers, and eggs, please see the respective Secure Food Supply Plans discussed in [Section 5.11](#). Additional information on the *Secure Egg Supply Plan* is provided in [Appendix C](#).

Table 5-6. Movement into Control Area from Outside Control Area to Specific Premises^a


Item Moving into a Control Area to a/an... 	Infected Premises	Suspect Premises ^c	Contact Premises ^c	At-Risk Premises	Monitored Premises
Poultry ^b	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Permit for movement must be approved by the IC with appropriate biosecurity measures.	Permit for movement must be approved by the IC with appropriate biosecurity measures.
Poultry products	See continuity of business plans (Secure Food Supply Plans) for information on susceptible poultry products, or guidance and processes as determined by the IC. Please see Section 5.10.5 which contains OIE AI-specific guidance for inactivating AI. In addition, Appendix C contains information on the <i>SES Plan</i> for egg and egg product movement during an HPAI outbreak.				
Other animals (non-susceptible) from premises with poultry	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Allowed with appropriate biosecurity measures. IC may require a permit for movement depending on HPAI epidemiology and characteristics of destination premises.	Allowed with appropriate biosecurity measures. IC may require a permit for movement depending on HPAI epidemiology and characteristics of destination premises.
Other animals (non-susceptible) from premises without poultry	IC will determine movement restrictions based on HPAI epidemiology and characteristics of destination premises.	IC will determine movement restrictions based on HPAI epidemiology and characteristics of destination premises.	IC will determine movement restrictions based on HPAI epidemiology and characteristics of destination premises.	Allowed with appropriate biosecurity measures. IC may require a permit for movement depending on HPAI epidemiology and characteristics of destination premises.	Allowed with appropriate biosecurity measures. IC may require a permit for movement depending on HPAI epidemiology and characteristics of destination premises.
Equipment, vehicles, and other fomites from premises with poultry	Allowed with appropriate biosecurity measures.	Allowed with appropriate biosecurity measures.	Allowed with appropriate biosecurity measures.	Allowed with appropriate biosecurity measures.	Allowed with appropriate biosecurity measures.
Semen, embryos from poultry	Prohibited.	Prohibited.	Prohibited.	Allowed with appropriate biosecurity measures.	Allowed with appropriate biosecurity measures.

^a Movement control and permit processes change over time depending on situational awareness and operational capabilities.

^b May include pet birds and other susceptible species as defined by IC during the outbreak.

^c Contact Premises and Suspect Premises are intended to be short-term premises designations. Ideally these premises should be re-designated before movements occur.

Table 5-7. Movement within a Control Area^a


Item Moving within a Control Area from a/an..... 	Infected Premises	Suspect Premises ^c	Contact Premises ^c	At-Risk Premises	Monitored Premises
Poultry ^b	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Prohibited, except under certain circumstances as determined by the IC, such as slaughter.	Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.	Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.
Poultry products	See continuity of business plans (Secure Food Supply Plans) for information on susceptible poultry products, or guidance and processes as determined by the IC. Please see Section 5.10.5 which contains OIE AI-specific guidance for inactivating AI. In addition, Appendix C contains information on the <i>SES Plan</i> for egg and egg product movement during an HPAI outbreak.				
Other animals (non-susceptible) from premises with poultry	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.	Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.
Other animals (non-susceptible) from premises without poultry	NA (Infected Premises have poultry)	NA (Suspect Premises have poultry)	NA (Contact Premises have poultry)	NA (At-Risk Premises have poultry)	NA (Monitored Premises have poultry)
Equipment, vehicles, and other fomites from premises with poultry	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Prohibited unless specific permit granted by IC and appropriate biosecurity measures.	Allowed by permit approved by IC and appropriate biosecurity measures.	Allowed by permit approved by IC and appropriate biosecurity measures.
Semen, embryos from poultry	Prohibited.	Prohibited.	Prohibited.	Allowed by permit approved by IC and appropriate biosecurity measures.	Allowed by permit approved by IC and appropriate biosecurity measures.

^a Movement control and permit processes change over time depending on situational awareness and operational capabilities.

^b May include pet birds and other susceptible species as defined by IC during the outbreak.

^c Contact Premises and Suspect Premises are intended to be short-term premises designations. Ideally these premises should be re-designated before movements occur.

Table 5-8. Movement from Inside a Control Area to Outside a Control Area from Specific Premises^a

Item Moving out of a Control Area from a/an... 	Infected Premises	Suspect Premises ^c	Contact Premises ^c	At-Risk Premises	Monitored Premises ^d
Poultry ^b	Prohibited, except under certain circumstances as determined by the IC.	Prohibited, except under certain circumstances as determined by the IC.	Prohibited, except under certain circumstances as determined by the IC.	At-Risk Premises must become Monitored Premises to move susceptible poultry out of a Control Area.	Allowed to move by permit approved by IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit.
Poultry products	See continuity of business plans (Secure Food Supply Plans) for information on susceptible poultry products, or guidance and processes as determined by the IC. Please see Section 5.10.5 which contains OIE AI-specific guidance for inactivating AI. In addition, Appendix C contains information on the <i>SES Plan</i> for egg and egg product movement during an HPAI outbreak.				
Other animals (non-susceptible) from premises with poultry	Prohibited unless specific permit approved by IC and appropriate biosecurity measures and risk-assessment.	Prohibited unless specific permit approved by IC and appropriate biosecurity measures and risk-assessment.	Prohibited unless specific permit approved by IC and appropriate biosecurity measures and risk-assessment.	Allowed to move by permit approved by IC; surveillance and negative diagnostic tests for susceptible poultry on premises, premises biosecurity, and risk-assessment may be required for permit.	Allowed to move by permit approved by IC; surveillance and negative diagnostic tests for susceptible poultry on premises, premises biosecurity, and risk-assessment may be required for permit.
Other animals (non-susceptible) from premises without poultry	NA (Infected Premises have poultry)	NA (Suspect Premises have poultry)	NA (Contact Premises have poultry)	NA (At-Risk Premises have poultry)	NA (Monitored Premises have poultry)
Equipment, vehicles, and other fomites from premises with poultry	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Prohibited unless permit approved by IC and appropriate biosecurity measures.	Allowed by permit approved by IC and appropriate biosecurity measures.	Allowed by permit approved by IC and appropriate biosecurity measures.
Semen, embryos from poultry	Prohibited.	Prohibited.	Prohibited.	At-Risk Premises must become Monitored Premises to move semen, embryos from susceptible poultry out of a Control Area.	Monitored Premises only allowed by permit approved by IC and appropriate biosecurity measures.

^a Movement control and permit processes change over time depending on situational awareness and operational capabilities.

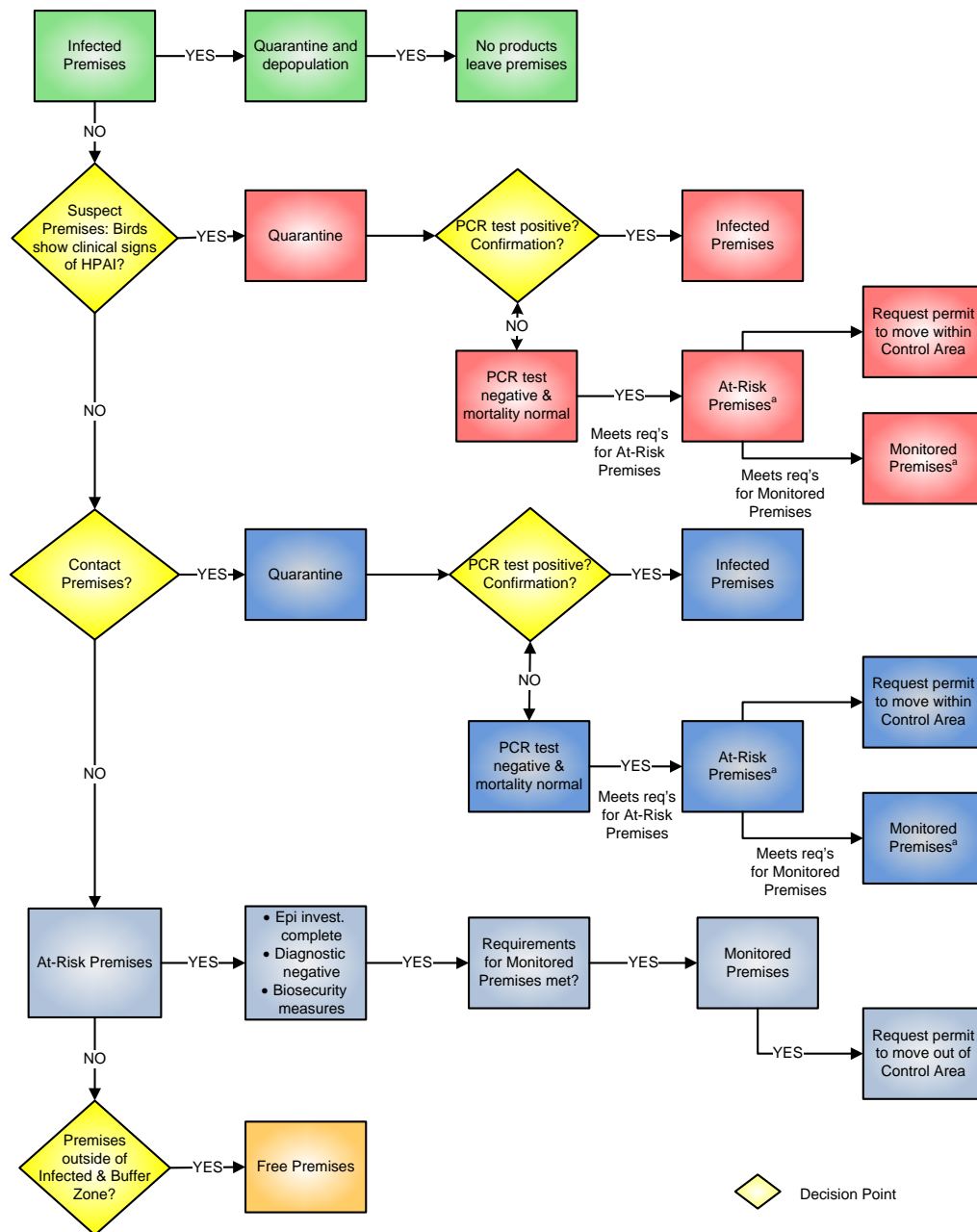
^b May include pet birds and other susceptible species as defined by IC during the outbreak.

^c Contact Premises and Suspect Premises are intended to be short-term premises designations. Ideally these premises should be re-designated before movements occur.

^d Continuity of business plans may apply.

For movement of susceptible poultry and poultry products out of the CA to an FA, the permit process must consider national standards, any OIE standards, and conditions for such movement such as biosecurity procedures and risk assessment recommendations. In addition, commodity-specific proactive risk assessments, continuity of business plans, movement and marketability plans, and compartmentalization plans will also be considered. Figure 5-4 illustrates premises designations in relation to permitting and movement control.

Figure 5-4. Premises Designations in Relation to Permitting and Movement Control



^a Continuity of business plans may apply.

5.10.3 Moving Commodities, Poultry, and Conveyances in an HPAI Outbreak

Any movement of commodities, animals, and conveyances brings some level of risk of HPAI transmission from a known or unknown IP to non-infected premises. The risk of moving commodities, poultry, and conveyances depends on the nature of the item being moved and its ability to transmit or be contaminated with HPAI. HPAI can be transmitted via items that contain biological material (such as manure), through infected animals, or via a contaminated fomite or person.

5.10.4 Guidance for All Premises

Because of the variation in the risk of the commodities, animals, and conveyances which move regularly in the poultry industries, it is possible that movements of one type of commodity, animal, or conveyance area allowed but other types are not—even from the same premises. In making the decision whether the movement will be allowed, substantial consideration will be given to critical movements (i.e., movement of animal feed onto a premise or movements related to animal welfare).

5.10.5 OIE Treatment Guidelines for HPAI

The OIE *Terrestrial Animal Health Code (2015)* provides guidance for the inactivation of AI virus in eggs, egg products, and meat. The Code also provides extensive information on the importation of various poultry products, including feather meal, down, meat products, and other products of poultry origin, including those intended for animal feeding or industrial use. The procedures for inactivating AI virus in eggs, egg products, and meat are reproduced here for easy reference, and should be considered in any movement control and permitting during an outbreak.

5.10.5.1 PROCEDURES FOR THE INACTIVATION OF THE AI VIRUS IN EGGS AND EGG PRODUCTS (ARTICLE 10.4.25)

Table 5-9 lists times for industry standard temperatures suitable for the inactivation of AI virus present in eggs and egg products:

Table 5-9. Inactivation of AI in Eggs and Egg Products

	Temperature (°C)	Time
Whole egg	60.0	188 seconds
Whole egg blends	60.0	188 seconds
Whole egg blends	61.1	94 seconds
Liquid egg white	55.6	870 seconds
Liquid egg white	56.7	232 seconds
10% salted yolk	62.2	138 seconds

Table 5-9. Inactivation of AI in Eggs and Egg Products

	Temperature (°C)	Time
Dried egg white	67.0	20 hours
Dried egg white	54.4	513 hours

Note: The listed temperatures are indicative of a range that achieves a 7-log kill. Where scientifically documented, variances from these times and temperatures may also be suitable when they achieve the inactivation of the virus.

5.10.5.2 PROCEDURES FOR THE INACTIVATION OF THE AI VIRUS IN MEAT (ARTICLE 10.4.26)

Table 5-10 lists times for industry standard temperatures are suitable for the inactivation of AI virus present in meat.

Table 5-10. Inactivation of AI in Meat

	Temperature (°C)	Time
Poultry meat	60.0	507 seconds
	65.0	42 seconds
	70.0	3.5 seconds
	73.9	0.51 seconds

Note: The listed temperatures are indicative of a range that achieves a 7-log kill. Where scientifically documented, variances from these times and temperatures may also be suitable when they achieve the inactivation of the virus.

5.10.6 Surveillance Required for Poultry and Product Movement

Surveillance measures are required for movement of poultry and poultry products for premises located in the CA (IZ and BZ). These steps include visual surveillance as well as diagnostic testing for at least 2 days prior to movement. Depending on the specific type of movement and item moved, one sample with negative diagnostic results is often required 24-hours prior to movement. For more information on surveillance requirements for poultry and product movement, see the *Secure Food Supply Plans* in [Section 5.11](#).

In some cases (e.g., widespread HPAI infection) States or the unified IC may elect to implement additional surveillance and testing measures—beyond those required by continuity of business plans—for specific movements, such as those involving live birds. These requirements may include premises residing in the FA.

5.11 CONTINUITY OF BUSINESS

Continuity of business is the management of non-infected premises and non-contaminated animal products in the event of an HPAI outbreak. Continuity of

business provides science- and risk-based approaches and systems as a critical activity in an HPAI response. This helps to facilitate agriculture and food industries maintain typical business, or return to business during a disease response, while the risk of disease spread and threat to public health is effectively managed. Continuity of business planning can help to minimize unintended consequences on producers and consumers impacted by HPAI. During an HPAI outbreak, permitting, movement control, and prioritized disruptions—all based on science- and risk-based approaches—are critical measures to ensure continuity of business during an HPAI outbreak. EMRS is the system of record for permitting activities involving a CA in an HPAI outbreak.

The *NAHEMS Guidelines: Continuity of Business* covers topics such as

- ◆ key roles and responsibilities in continuity of business planning,
- ◆ details of developing continuity of business plans,
- ◆ potential components required for continuity of business planning, and
- ◆ preparedness and response goals.

For more information on continuity of business plans, see the following:

- ◆ *Secure Egg Supply Plan*: www.secureeggssupply.com
- ◆ *Secure Turkey Supply Plan*: www.secureturkeysupply.com
- ◆ *Secure Broiler Supply Plan*: www.securebroilersupply.com.

These plans offer guidance for movement of eggs, egg products, turkeys, and broilers, including surveillance, biosecurity, cleaning and disinfection, and other procedures for movement during an HPAI outbreak.

5.12 REGIONALIZATION FOR INTERNATIONAL TRADE (FOR A U.S. HPAI RESPONSE)

In the event of an HPAI outbreak in the United States, international trade of animals and animal products may be adversely affected for a significant period of time. This would have serious economic implications for the affected industries and the United States. Therefore it is important to identify, prior to an outbreak, potential procedures and plans that may mitigate the consequences and reestablish international trade as rapidly as possible.

As defined by the OIE, regionalization, also known as zoning, is the concept of separating subpopulations of animals in order to maintain a specific health status in one or more disease-free regions or zones. Disease-free regions can be created to facilitate continuity of business and reestablish international trade from the

regions demonstrated to be disease-free. Regionalization recognizes that risk may be tied to factors that are not reflected by political boundaries of the nation or individual States, especially when the outbreak has been confined to specific areas within an individual State or group of States. Providing information to the OIE, its member countries and our trading partners, which clearly identifies the boundaries of the disease-free areas, can be used to inform our trading partners' decisions whether to receive or reject our exports. This risk-based process, based on sound science, can mitigate the adverse economic effects of an HPAI outbreak.

In the 2014–2015 HPAI outbreak, many (but not all) trading partners—based on the evidence the United States provided to the OIE and other countries—did decide to regionalize the United States and ban exports only from affected counties or States. This allowed exports from unaffected regions to continue, mitigating the overall economic impact of the outbreak.

5.12.1 Compartmentalization

Another tool that may potentially mitigate the economic consequences of a disease outbreak is compartmentalization. Compartmentalization, which defines an animal subpopulation by management and husbandry practices related to biosecurity, could be used by the veterinary authorities to demonstrate and maintain DF in certain commercial establishments whose practices have prevented the introduction of the disease. The disease-free status of these compartments could enable trade movement of poultry and poultry products. Compartmentalization has not been fully implemented by the United States for any disease agent to-date, and will depend on the recognition of the status of these compartments by international trading partners. Implementation of compartmentalization will rely on producers, industry, and State and Federal animal health authorities. By working closely together to develop and strengthen relationships and implementing the agreed upon procedures proceeding an FAD outbreak, compartmentalization may be a useful tool.

5.12.2 Further Guidance

The OIE *Terrestrial Animal Health Code (2015)* also offers guidance on regionalization and compartmentalization in Chapters 4.3 and 4.4. Currently there are no internationally accepted or fully implemented HPAI-free compartments in the United States.

5.13 MASS DEPOPULATION AND EUTHANASIA

When the criteria for a presumptive positive have been met (per the HPAI case definition), the APHIS Administrator or VS Deputy Administrator (U.S. CVO) will authorize APHIS personnel—in conjunction with State and Tribal officials, and Incident Command personnel—to initiate depopulation on IP. Investigation of CP is also authorized at this time. Depopulation of poultry on CP, or poultry meeting the suspect case definition, may also be authorized by APHIS officials—

in coordination with State and Tribal officials and Incident Command—depending on epidemiological information and outbreak characteristics. Preemptive depopulation of poultry on other premises in the Infected Zone (typically 3 km around the IP) may also be authorized.

Indemnity for depopulated poultry is authorized by APHIS as funds are available. The final determination to depopulate entire Infected Premises, or specific houses on Infected Premises, or depopulate Contact Premises, will be made by SAHOs/Tribal officials and APHIS.

Best practices for containment and eradication of HPAI require rapid depopulation of infected poultry. Swift stamping-out is required to prevent the amplification of HPAI virus and subsequent environmental contamination. In all cases, depopulation activities must incorporate excellent biosecurity practices to control the HPAI virus and prevent further transmission.

5.13.1 Depopulation Goal & Methods

Due to the risk of virus amplification in infected poultry, authorized depopulation activities should be completed as quickly as possible; the goal is within 24 hours. Infected poultry shed large amounts of HPAI virus, making control and eradication of HPAI more difficult and increasing the potential for environmental contamination.

Carbon dioxide and water-based foam concentrate have most commonly been used to depopulate poultry flocks. However, to meet the goal of depopulation within 24 hours and halt virus production, other alternative methods may also be considered by State and APHIS officials.

The *NAHEMS Guidelines: Mass Depopulation and Euthanasia* contains additional information on euthanasia and mass depopulation methods for poultry, including the following:

- ◆ carbon dioxide or other gas,
- ◆ water-based foam concentrate, and
- ◆ other methods.

5.13.2 Best Practice Guidance

In the event of an HPAI outbreak, euthanasia or mass depopulation should be provided to affected poultry as safely, quickly, efficiently, and humanely as possible. In addition, the emotional and psychological impact on animal owners, caretakers, their families, and other personnel should be minimized.

Mass depopulation and euthanasia are not synonymous, and APHIS recognizes a clear distinction. Euthanasia involves transitioning an animal to death as

painlessly and stress-free as possible. Mass depopulation is a method by which large numbers of animals must be destroyed quickly and efficiently with as much consideration given to the welfare of animals as practicable, given extenuating circumstances. Mass depopulation is employed in an HPAI outbreak as a response measure to prevent or mitigate the spread of HPAI through the elimination of infected or potentially infected animals. As stated by the American Veterinary Medical Association (AVMA) on their website, “mass depopulation refers to methods by which large numbers of animals must be destroyed quickly and efficiently with as much consideration given to the welfare of the animals as practicable, but where the circumstances and tasks facing those doing the depopulation are understood to be extenuating.”

Qualified personnel should perform mass depopulation in the event of an HPAI outbreak using the safest, quickest, and most humane procedures available. In an HPAI outbreak, it is likely that contactor support for 3D (depopulation, decontamination, and disposal) activities will be required for both personnel and materials. This should be coordinated with the SPRS Logistics Center through the ICG.

5.14 DISPOSAL

Appropriate disposal of animal carcasses and materials is a critical component of a successful HPAI response. HPAI can survive for long periods on both organic and inorganic materials. The *Disposal SOP* discusses how to dispose of thousands of bird carcasses, contaminated and potentially contaminated materials, poultry products, items that cannot be properly cleaned and disinfected (such as manure, litter, and bedding), products of the response effort (such as PPE), and products of vaccination response. Disposal occurs as soon as possible after flock depopulation.

There are multiple options for disposal. Composting and disposal by managed landfill are two methods that address the need to minimize negative environmental impact while also mitigating virus spread. Composting was implemented in the 2014–2015 HPAI outbreak on many premises; it can be performed on-site, either “in-house” or outdoors (with the appropriate cleaning and disinfection/biosecurity measures implemented in either case). Composting materials are likely to be readily available (e.g., a carbon source, in particular). Managed landfills may be equipped to handle such waste appropriately, though their ability or willingness to accept carcasses may vary. Incineration is another option, though fuel requirements, lower capacities, and smoke discharge can be challenging. On-site burial has been a commonly accepted means of disposal, though it may present significant issues related to potential environmental contamination. Off-site burial may also be considered in a large HPAI incident. In a widespread outbreak, multiple means of disposal will be required.

Please see the *Disposal SOP* for more details on any of the disposal methods mentioned. Other methods such as digestion, rendering, and hydrolysis may be

considered, as indicated by the circumstances of the outbreak and disposal requirements. Disposal methods should always be assessed and applied appropriately, given the facility location, type of housing, premises characteristics, and other situational factors. Subject matter experts (i.e., for composting) are available to assist field personnel to ensure disposal methods are efficient and effective.

Disposal must always occur in a biosecure way that does not allow HPAI virus to spread and minimizes negative environmental impact. In addition, local and State regulations must be observed or memorandums of understanding must be obtained to ensure disposal capability. IC coordinates closely with local authorities in deciding how to dispose of carcasses and other items. Cost effectiveness and stakeholder acceptance must also be considered in disposal decisions. If movement is required for disposal, the IC must permit such movement. In the event that available personnel are insufficient for disposal requirements in an HPAI outbreak, the Incident Commander can request emergency 3D contractor support from the SPRS Logistics Center through the ICG. The *NAHEMS Guidelines: Disposal* contains further guidance on disposal.

5.15 CLEANING AND DISINFECTION

5.15.1 Cost Effective Virus Elimination from Infected Premises

Because of HPAI's high survival rate on both organic and inorganic materials, aggressive cleaning and disinfection practices are required for both ongoing biosecurity measures to contain the HPAI virus to IP and to eliminate virus from contaminated equipment, materials, and all other fomites. Cleaning and disinfection steps are necessary to control and eliminate HPAI during an outbreak.

Cleaning is the removal of gross contamination, organic material, and debris from the premises. This can be conducted through a mechanical means like sweeping (dry cleaning) and/or the use of water and a soap or detergent (wet cleaning). Disinfection refers to the methods that are used on surfaces to destroy or eliminate HPAI virus. This can be physical (e.g., heat) or chemical (e.g., disinfectant). A combination of methods may be required; generally a premises must be both cleaned *and* disinfected, based on the recommendation of the IC. All disinfectants must be Environmental Protection Agency (EPA)-approved for AI; off-label use of disinfectants is illegal. The ICG and IC will provide guidance on the available options for both cleaning and disinfection.

Cleaning and disinfection practices during an outbreak should focus on virus elimination in a cost effective manner. While traditionally wet cleaning and disinfectant has been performed in many incidents, dry cleaning and heating of the houses may be a preferred approach during a widespread HPAI outbreak. Any method selected should consider the characteristics of the premises/houses and other factors which may impact the effectiveness of the virus elimination

activities. For example, freezing or sub-zero temperatures may make certain techniques impractical and unsuccessful. USDA continues to seek novel methods for cleaning and disinfection activities, and modify recommendations based on new scientific information on virus elimination methods.

Depending on the disposal method, initial cleaning and disinfection may occur prior to final cleaning and disinfection—for example, if compost piles are set inside a house, the house cannot be cleaned and disinfected until those compost piles are removed. However, the initial cleaning and disinfection on vehicles, equipment, and outdoor areas can be completed prior to the final cleaning and disinfection of the entire premises. Any cleaning and disinfection steps on Infected Premises need to account for water and feeding systems, ventilation, slats, nest box material, egg packing machines, egg storage areas, floor areas, the exterior of the house, and other materials and areas must be cleaned and disinfected (this is not an all-inclusive list).

5.15.2 Premises that Can't Be Cleaned and Disinfected

In the unusual circumstance in which commercial premises cannot be cleaned and disinfected, fallowing for 120-days—or a period recommended by IC—is prescribed. The length of this period will vary depending on temperature and season. Fallowing typically is reserved for premises that would need to be completely repaired or destroyed in order to be effectively cleaned and disinfected.

5.15.3 Further Information

The *Cleaning and Disinfection SOP* provides information on

- ◆ the HPAI cleaning and disinfection effort,
- ◆ optimal cleaning and disinfection methods for HPAI,
- ◆ processes used to inactivate HPAI from organic materials,
- ◆ how to clean and disinfect equipment and premises after HPAI detection, and
- ◆ EPA antimicrobial products registered for use against the H1N1 flu and other influenza A viruses: www.epa.gov/oppad001/influenza-disinfectants.html.

The *NAHEMS Guidelines: Cleaning and Disinfection* and associated educational materials contain additional information on cleaning and disinfection.

5.16 VACCINATION

Although stamping-out is the preferred and primary strategy for controlling and eradicating HPAI in the event of an outbreak, emergency vaccination may be considered in specific circumstances.

5.16.1 Emergency Vaccination Strategies for Poultry

There are two distinct purposes of emergency vaccination:

1. *Emergency vaccination to kill*
 - a. A suppressive emergency vaccination strategy.
 - b. The goal is to suppress virus replication in high-risk susceptible poultry using emergency vaccination and then killing vaccinates at a later date as determined by IC and the VS Deputy Administrator (U.S. CVO).
 - c. Target vaccination of high-risk susceptible poultry in an IZ, CA, or VZ. Ring or regional vaccination around an IP or an IZ is a frequently cited example of this strategy.
2. *Emergency vaccination to live*
 - a. A protective emergency vaccination strategy.
 - b. The goal is to protect susceptible poultry from infection using emergency vaccination with the deliberate intent to maintain vaccinates for the duration of their usefulness.
 - c. Targeted vaccination may include layers, valuable genetic stock, or endangered birds.

[Appendix H](#) contains information on available HPAI vaccine. The *NAHEMS Guidelines: Vaccination for Contagious Diseases—Appendix C: Vaccination for HPAI* contains more information.

5.16.2 Differentiating Infected from Vaccinated Animals and Surveillance of Vaccinated Flocks

Emergency vaccination requires vaccinated animal traceability and the diagnostic capability to differentiate infected and vaccinated animals (also known as a DIVA strategy) for movement between zones, interstate commerce, and international trade. In addition, even if a vaccine is used, surveillance must be continued to detect any antigenic change of the circulating influenza virus.

The DIVA strategy can help to control an HPAI outbreak and is fundamental to safeguarding international trade. It may employ

- ◆ serological and viral detection in unvaccinated sentinels placed in a vaccinated flock, and
- ◆ viral detection in vaccinated or non-vaccinated nondomestic avian species by diagnostic test, and
- ◆ use of a licensed recombinant vaccine containing only the AI hemagglutinin gene and detection of infection by the presence of antibodies to nucleoprotein or matrix protein, or
- ◆ use of inactivated oil emulsion heterologous vaccine containing the same H subtype as the field virus but a different N subtype.

5.16.3 Assessment and Overview

Federal, State, and other advisors evaluate whether to vaccinate if vaccine has been requested; emergency vaccine use is an important issue that will be discussed by the offices of the Administrator and Secretary of APHIS and USDA, respectively. The SAHO or Tribal official and the APHIS VS Deputy Administrator (the U.S. CVO) must agree on the decision to vaccinate. A decision-tree matrix may also be employed to help decision-makers.

H5 and H7 vaccines are for use only under the supervision or control of USDA APHIS VS, and only as part of an official USDA Animal Disease Control Program (see VS Memorandum 800.85 www.aphis.usda.gov/animal_health/vet_biologics/publications/memo_800_85.pdf). Other subtypes are under the authority of the SAHO. USDA APHIS Center for Veterinary Biologics implements the provisions of the Virus-Serum-Toxin Act to ensure that veterinary biologics used to treat animal diseases are pure, potent, and effective.

Please refer to the AZA for more information on vaccinating zoo animals: www.zooanimalhealthnetwork.org/ai/Home.

5.16.3.1 DECIDING TO VACCINATE FOR HPAI

The decision for emergency vaccination will be based on the consideration of the following elements:

- ◆ Probability that the disease can or cannot be rapidly contained;
- ◆ Proximity of high-value genetic birds to the rapidly spreading disease focal point;
- ◆ Risk of infection of valuable, rare, or endangered nondomestic species;
- ◆ Poultry density in an area;

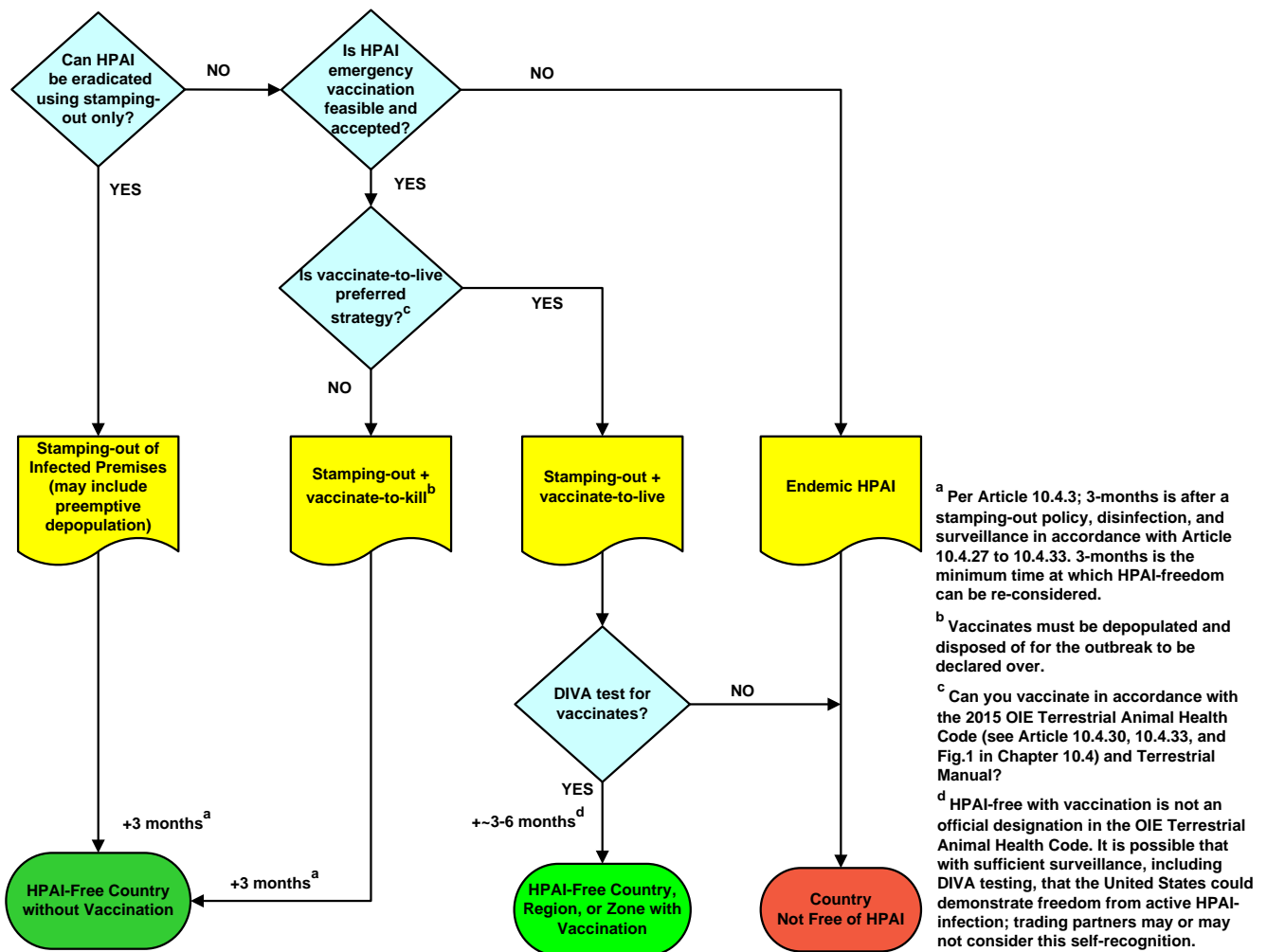
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- ◆ Impact on international trade;
 - ◆ Increased risk of introduction due to the presence of HPAI in neighboring countries;
 - ◆ The extent to which disease is found in waterfowl, other wild birds, backyard flocks, or in live bird markets;
 - ◆ Availability of physical and human resources;
 - ◆ Sociopolitical factors (public confidence in commercial poultry products);
 - ◆ Acceptance of industry stakeholders;
 - ◆ Potential risk of zoonotic infection of the public from exhibition birds; and
 - ◆ Economic consequences of failure to control the disease.

The safety and health of vaccination personnel must be considered in any vaccination effort, and appropriate PPE must be used.

5.16.3.2 EXAMPLE DECISION TREE FOR HPAI VACCINE USE

Figure 5-5 shows a possible decision tree for emergency vaccine use in domestic poultry in the event of an HPAI outbreak.

Figure 5-5. Example Decision Tree for Emergency Vaccination in Domestic Poultry



5.16.4 Strategic Vaccine Distribution

Typically, if emergency vaccination is employed for the purposes of disease control, it is strategically implemented to create a ring or “firebreak” of vaccinated poultry around the IZ, creating a Containment Vaccination Zone (CVZ). A second option is to vaccinate susceptible poultry on premises that are farthest from known IP as a priority, and then vaccinate progressively closer to the IP. A third option is to vaccinate susceptible poultry only on premises that are closest to an IP. Vaccination may also be used (as a protection strategy) to protect valuable, rare, or endangered non-domestic species of birds, creating a Protection Vaccination Zone (PVZ).

An emergency vaccination strategy will be carefully tailored to the epidemiology and threats of the specific outbreak. Genetically valuable birds, including breeding stock, will be vaccinated early in an emergency vaccination strategy with the concurrence of IC, SAHO, and APHIS. The priority in which other birds are vaccinated will be determined at the time of an outbreak, and will also be based on many of the factors listed in [Section 5.16.3.1](#).

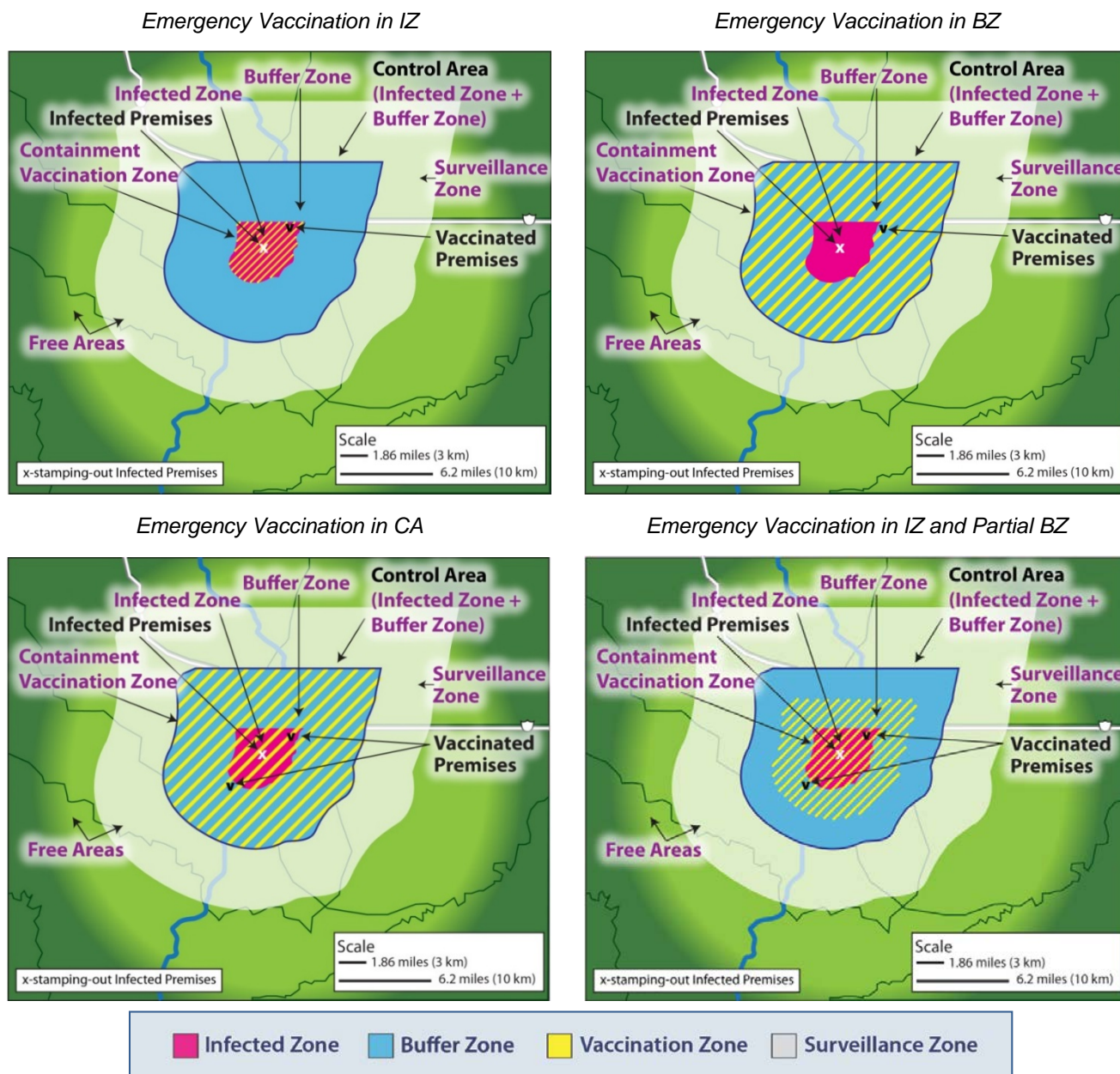
5.16.5 Vaccination Zone Designations

The following sections present illustrations of the VZ designations.

5.16.5.1 CONTAINMENT VACCINATION ZONE

The CVZ is an emergency vaccination zone typically inside the CA, and may include the IZ or the BZ. A CVZ is typically observed with stamping-out modified with emergency vaccination to kill. Figure 5-6 shows examples of CVZs. Please note that the SZ is part of the FA.

Figure 5-6. Examples of Containment Vaccination Zones



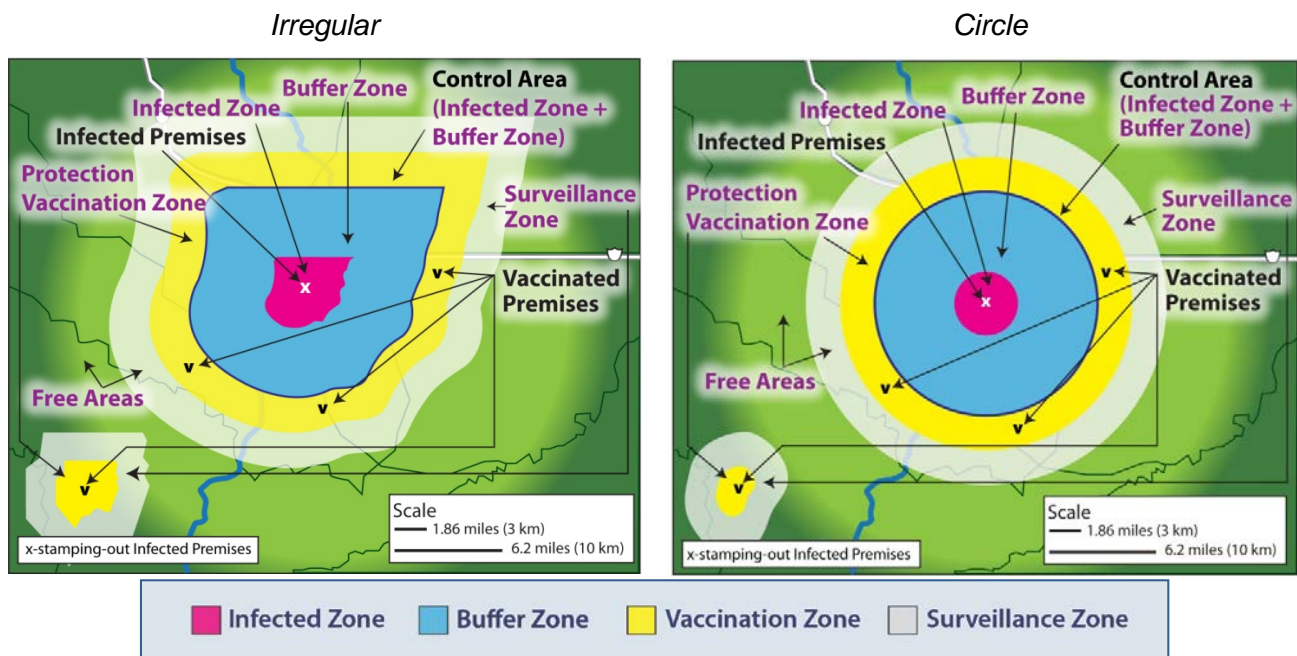
5.16.5.2 PROTECTION VACCINATION ZONE

The PVZ is an emergency vaccination zone typically outside the CA. It is consistent with the OIE *Terrestrial Animal Health Code (2015)* definition for a Protection Zone:

A zone established to protect the health status of animals in a free country or free zone, from those in a country or zone of a different animal health status, using measures based on the epidemiology of the disease under consideration to prevent spread of the causative pathogenic agent into a free country or free zone. These measures may include, but are not limited to, vaccination, movement control and an intensified degree of surveillance.

Typically, a PVZ is observed with stamping-out modified with emergency vaccination to live. Figure 5-7 shows examples of PVZs. Please note that the SZ is part of the FA.

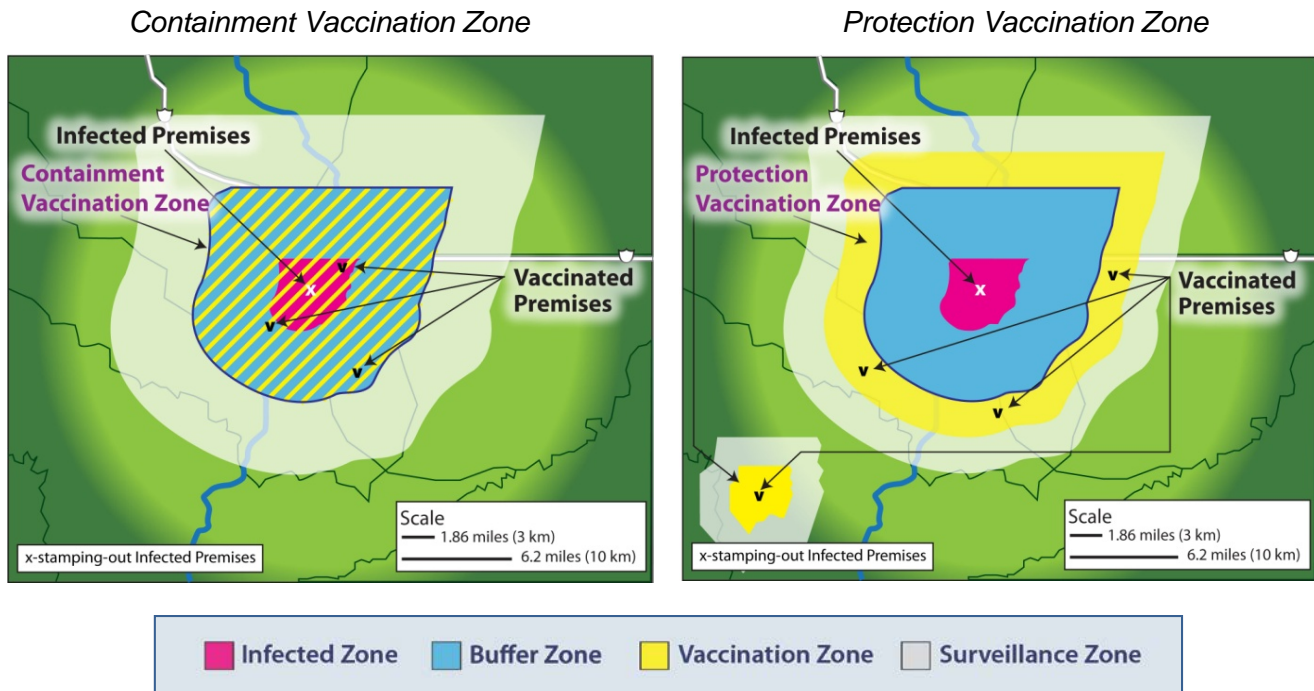
Figure 5-7. Examples of Protection Vaccination Zones



5.16.6 Vaccinated Premises

VP is typically a secondary designation to another premises designation, and is only used if vaccination is employed in an outbreak. A VP may be located in a CVZ, typically inside a CA (an IZ or BZ), or in a PVZ, typically outside a CA. Figure 5-8 shows VP in a CVZ (left) and a PVZ (right).

Figure 5-8. Examples of Vaccinated Premises



5.16.7 Movement Restrictions for Vaccinates

If vaccination is used, a vaccination plan will define procedures to prevent the spread of HPAI by vaccination teams. Vaccination occurs within a CVZ or a PVZ. All vaccinated animals will be identified with specific and permanent (tamper-proof) identification. When vaccine is used, surveillance must continue to assess vaccination effectiveness and detect any antigenic change.

VP will be subject to the risk assessments, surveillance requirements, and biosecurity procedures established for the primary premises or zone designation. In addition to the movement and permit process outlined by the IC, consideration must be given to any national or international (OIE) standards or conditions for such movement. EMRS will be used as the system of record for movements.

5.16.8 Cessation of Vaccination

AI vaccination should cease as soon as possible to allow the region or State to return quickly to a favorable trade status. While IC, SAHOs, and APHIS will indicate when vaccination must cease, it is likely that no new vaccinations will be given more than 42 days (2 times the 21 day OIE-incubation period) after the last known new case of HPAI is detected. The best epidemiological evidence available will be taken into consideration in making this decision.

5.17 LOGISTICS

During an HPAI outbreak, getting resources and personnel where they are needed when they are needed is a critical activity that grows in complexity based on the size and scope of the response operation. The SPRS Logistics Center (which includes the NVS) works with the IMTs through the ICG to coordinate APHIS resources and resources contracted by APHIS (both personnel and equipment) for field operations. Contractor support for these operations is available, and can be requested through the IC and ICG. Personnel can be on-site in 24 hours and ramped up quickly. However, in a widespread outbreak, personnel shortages can still occur.

The *Overview of the NVS SOP* also provides information on NVS capabilities and lays out the required steps to request resources from the NVS. It also provides a direct link to the [NVS website](#), where State preparedness officials and responders can download important publications to help them understand the NVS. This website provides

- ◆ a planning guide for Federal, State, and local authorities;
- ◆ a template for a State NVS plan; and
- ◆ information on outreach and exercise programs.

5.18 WILDLIFE MANAGEMENT AND VECTOR CONTROL

USDA APHIS works in close collaboration, communication, and coordination with DOI and other Federal, State, Tribal, and local wildlife agencies that have primary jurisdictional authority and subject matter expertise for wildlife. This collaboration, communication, and coordination occurs in both the Unified IC as well as in MAC Groups.

The *NAHEMS Guidelines: Wildlife Management and Vector Control for an FAD Response in Domestic Livestock* discusses personnel and equipment required for wildlife management, quarantine and movement control for wildlife, wildlife risk assessment, wildlife surveillance, and related activities. Please see VS Memorandum 573.1 for additional information on VS animal health policy in relation to wildlife.

5.18.1 Wildlife Management

In any HPAI response, wildlife surveillance and other management must be conducted by persons trained and proficient in wildlife health, capture, collection, biosecurity, and restraint.

A wildlife management plan that addresses transmission of HPAI in wildlife (in particular, wild birds) is developed as soon as possible after identification of the index case in domestic poultry. If there is evidence of HPAI transmission between wild birds and domestic poultry in either direction, this plan should aim to mitigate this transmission pathway, preventing the exposure of wild birds to poultry and other livestock. Additionally, an assessment of the risk that wildlife poses for HPAI transmission to susceptible birds, poultry, and other animals should be conducted within 7 days of confirmation of the index case.

Importantly, HPAI in wild birds does not impact OIE HPAI-free status. As stated in the OIE *Terrestrial Animal Health Code (2015)*, in Article 10.4.1,

Infection with influenza A viruses of high pathogenicity in birds other than poultry, including wild birds, should be notified in accordance with Article 1.1.3. However, a Member Country should not impose bans on the trade in poultry and poultry commodities in response to such a notification, or other information on the presence of any influenza A virus in birds other than poultry, including wild birds.

5.18.2 Vector Control

HPAI can be transmitted mechanically by mice, vultures, and other vectors. Appropriate biosecurity measures should be in place during an HPAI outbreak to ensure that mechanical vectors do not have contact with infected flocks or other infected material. These biosecurity measures must also prevent the contamination of food and water by all vectors.

5.19 ANIMAL WELFARE

During an HPAI outbreak, humane treatment must be provided to animals given the specific circumstances of the outbreak, particularly from the time they are identified for depopulation or vaccination activities until they are depopulated, or euthanized, as prescribed by veterinary authorities of the affected States or Tribal nations. The *Overview of Animal Welfare SOP* contains additional information.

5.20 MODELING AND ASSESSMENT TOOLS

The development of models and risk assessments are critical in a successful HPAI response, by giving decision-makers valuable insight into potential epidemiological spread, economic impact, and geospatial risk factors. During an outbreak, one or more multidisciplinary teams (consisting of epidemiologists, disease agent experts, economists, affected commodity experts, and others) is established to perform risk assessments and other relevant analyses as needed. An appropriate, scientific, risk assessment on any issue of concern will be provided within 72 hours after a request from the Incident Commander or ICG.

The *Overview of Modeling and Assessment Tools SOP* provides information on modeling and risk assessment, covering the following:

- ◆ Key roles and responsibilities in modeling and risk analysis;
- ◆ Uses of epidemiological models;
- ◆ Proactive risk assessments;
- ◆ Risk assessment during and after an outbreak; and
- ◆ Examples of current models and assessment tools.

5.21 APPRAISAL AND COMPENSATION

Indemnity payments are to encourage disease reporting, reduce the spread of animal disease, and compensate owners on the basis of fair market value.

5.21.1 Authority

The AHPA gives APHIS authority to establish and implement an indemnification program to prevent or eradicate an HPAI outbreak; 9 CFR 53 provides additional regulations. Indemnity is a key component of APHIS's disease control programs in that the promise of fair compensation for losses helps to ensure cooperation from the owners of affected poultry. Such cooperation is important for rapid disease control and eradication. In addition to the depopulation of IP, in many cases, poultry on CP or those meeting the suspect case definition may also be depopulated as soon as possible. This helps to ensure that HPAI does not spread.

The Secretary of Agriculture has the authority to pay up to 100 percent of the fair market value of the poultry, as well as for disposal, cleaning, and disinfection. However, compensation is only paid in cases where State and Federal animal health officials concur with the recommendations to order the destruction of poultry, whether those recommendations emerged from industry, State, or Federal authorities. Title 9 CFR 53 provides regulations for indemnifying indemnity the owner of animals or materials requiring destruction.¹

5.21.2 Appraisal and Compensation During an Outbreak

State and APHIS officials approve depopulation prior to its occurrence. This will require rapid communication between producer, company, State officials, APHIS, and laboratory officials. During an HPAI outbreak, poultry may be depopulated based on a presumptive positive (consistent with the case definition) from a diagnostic test conducted at a NAHLN laboratory. Depopulation of poultry on Contact Premises, or poultry meeting the suspect case definition, may also be authorized by APHIS officials—in coordination with State and Tribal officials

¹ Title 9 CFR Chapter 1, Part 53, www.access.gpo.gov/nara/cfr/waisidx_10/9cfr53_10.html.

and Incident Command—depending on epidemiological information and outbreak characteristics.

Best practices for rapid containment and eradication of HPAI means that in many instances, 3D activities must commence immediately, making slow or deliberate appraisal processes unsuitable. While every attempt should be made to provide an accurate fair market appraisal to owners and flock managers prior to depopulation, in some emergency situations, appraisals will not be required to be signed prior to depopulation if APHIS and the cooperating State agree that the poultry must be destroyed immediately to mitigate the potential spread or amplification of HPAI virus on a presumptive or confirmed positive premises. However, all data required to determine fair market value should be collected prior to depopulation: in particular, a complete inventory of poultry being depopulated must be conducted. Owner/manager information, number of barns, and location of premises is also required information that should be collected as quickly as possible.

Appraisal and compensation documents released by the ICG or IC during the incident specify personnel responsibilities, appraisal procedures, assessment of compensation eligibility, payment of indemnity, and required forms and reports during an HPAI outbreak. The Operations Section in the ICG is responsible for calculating indemnity payments and appraisal processing.

5.22 FINANCE

During an HPAI outbreak, funding may be rapidly required. For responding to specific emergency situations, VS has access to a variety of sources for funding. The two most common sources are the APHIS Contingency Fund (CF) and the Commodity Credit Corporation (CCC).

APHIS CF takes care of unforeseen, unpredictable problems requiring temporary programs. The following four conditions must exist to qualify for the release of agency contingency funds:

1. The outbreak must pose an economic threat.
2. Eradication technology must be feasible and cost effective.
3. No program or no effective program must currently exist.
4. The proposed program must have industry support.

For funds in excess of \$1 million, CCC funding is typically requested. During an emergency, the Secretary is authorized to transfer funds from the CCC. The funds are provided to APHIS as no-year funds. Before APHIS can ask the Secretary to transfer funds, however, it must consider whether it can redirect funds from a budget line item or if other funding sources are available. APHIS considers the

total estimated amount of funding needed to address the issue and whether there is political support before deciding whether or not to seek a CCC transfer.

The *Overview of Finance SOP* contains additional guidance on

- ◆ key roles and responsibilities in finance,
- ◆ emergency funding processes for FAD outbreaks, and
- ◆ triggering events for APHIS emergency funding.

5.23 INCIDENT MANAGEMENT

In any HPAI outbreak, the capability to rapidly scale up the size of an IC and integrate veterinary functions and countermeasures is critical for an effective response. NRF and NIMS, already discussed in this plan, allow such scalability. The *Overview of NRF and NIMS SOP* provides additional information on the relation of NRF and NIMS to APHIS and lists the responsibilities of Federal, State, Tribal, and local governments in an HPAI outbreak.

The SOPs and NAHEMS Guidelines referenced in this chapter can be found at www.aphis.usda.gov/fadprep.

Chapter 6

Recovery after an HPAI Outbreak

6.1 PROOF-OF-FREEDOM

6.1.1 Recognition of Disease-Free Status

The OIE does not grant official recognition for AI-freedom or HPAI-freedom, but as a member of the OIE, the United States can self-declare a compartment, zone, or the country free from certain OIE-listed diseases such as AI and HPAI. In cases of self-declaration, delegates are advised to consult the OIE *Terrestrial Animal Health Code* for specific requirements for self-declaration of freedom from AI or HPAI. By providing relevant epidemiological evidence, the OIE member can provide information to demonstrate to potential importing countries that the entire country, zone, or compartment under discussion meets the provisions of the specific disease chapter. Any submitted self-declaration should contain evidence demonstrating that the requirements for the disease status have been met in accordance with OIE standards.

6.1.1.1 CRITERIA NEEDED FOR AI-FREE STATUS

The OIE defines an AI-free country, zone, or compartment as follows (Article 10.4.3):

A country, zone, or compartment may be considered free from avian influenza when it has been shown that infection with avian influenza viruses in poultry has not been present in the country, zone, or compartment for the past 12 months, based on surveillance in accordance with Articles 10.4.27 to 10.4.33.

If infection has occurred in poultry in a previously free country, zone, or compartment, avian influenza free status can be regained:

1. In the case of infections with high pathogenicity avian influenza viruses, three months after a stamping-out policy (including disinfection of all affected establishments) is applied, providing that surveillance in accordance with Articles 10.4.27 to 10.4.33 has been carried out during that three-month period.

-
2. In the case of infections with low pathogenicity avian influenza viruses, poultry may be kept for slaughter for human consumption subject to conditions specified in Article 10.4.19 or a stamping-out policy may be applied; in either case, three months after the disinfection of all affected establishments, providing that surveillance in accordance with Articles 10.4.27 to 10.4.33 has been carried out during that three-month period.

6.1.1.2 CRITERIA NEEDED FOR HPAI-FREE STATUS

The OIE defines an HPAI-free country, zone, or compartment as follows (Article 10.4.4):

A country, zone, or compartment may be considered free from infection with high pathogenicity avian influenza viruses in poultry when:

1. it has been shown that infection with high pathogenicity avian influenza viruses in poultry has not been present in the country, zone, or compartment for the past 12 months, although its status with respect to low pathogenicity avian influenza viruses may be unknown; or
2. when, based on surveillance in accordance with Articles 10.4.27 to 10.4.33, it does not meet the criteria for freedom from avian influenza but any virus detected has not been identified as high pathogenicity avian influenza virus.

The surveillance may need to be adapted to parts of the country or existing zones or compartments depending on historical or geographical factors, industry structure, population data, or proximity to recent outbreaks.

If infection has occurred in poultry in a previously free country, zone, or compartment, the free status can be regained three months after a stamping-out policy (including disinfection of all affected establishments) is applied, providing that surveillance in accordance with Articles 10.4.27 to 10.4.33 has been carried out during that three-month period.

6.1.1.3 HPAI-FREE COMPARTMENTS

There are no HPAI-free compartments in the United States that have been fully implemented and internationally accepted.

6.1.2 Surveillance for Recognition of Disease Freedom

Surveillance is fundamental in proving DF to regain disease-free status after an HPAI outbreak. According to the OIE, a country re-declaring for country, zone, or compartment freedom from HPAI virus should show evidence of an active surveillance program, considering the epidemiological circumstances of the

outbreak to demonstrate absence from infection. This requires surveillance that incorporates virus detection and antibody tests described in the OIE *Terrestrial Animal Health Code (2015)*. Surveillance schemes could also be intensified in conjunction with CA surveillance by

- ◆ conducting surveillance for 3 months after detection and depopulation of last IP, on the basis of detecting at least one IP where the prevalence rate equals or exceeds 1 percent, at the 95 percent confidence level;
- ◆ increasing slaughter sampling (sero-surveillance); and
- ◆ in some cases, increasing the use of sentinel flocks.

[Appendix D](#) offers surveillance guidance for proof-of-freedom for IZs, BZs, and SZs for both backyard and commercial premises. In all cases the number of premises to be sampled is based on detecting at least one IP with 95 percent confidence. Article 10.4.29 and Article 10.4.30 in the OIE *Terrestrial Animal Health Code (2015)* provide information on surveillance strategies and the documentation of HPAI status, respectively.¹

6.1.2.1 SPECIFIC OIE SURVEILLANCE GUIDANCE FOR COUNTRIES REGAINING FREEDOM

Specifically for countries that are regaining freedom from AI or HPAI after an outbreak, the OIE states (Article 10.4.31):

In addition to the general conditions described in the above-mentioned articles, a Member Country declaring that it has regained country, zone, or compartment freedom from avian influenza or from infection with high pathogenicity avian influenza viruses in poultry should show evidence of an active surveillance program depending on the epidemiological circumstances of the outbreak to demonstrate the absence of the infection. This will require surveillance incorporating virus detection and antibody tests. The use of sentinel birds may facilitate the interpretation of surveillance results.

A Member Country declaring freedom of country, zone, or compartment after an outbreak of avian influenza should report the results of an active surveillance program in which the susceptible poultry population undergoes regular clinical examination and active surveillance planned and implemented in accordance with the general conditions and methods described in these recommendations. The surveillance should at least give the confidence that can be given by a randomized representative sample of the populations at risk.

¹ The NPIP (9 CFR 145) provides additional information on surveillance for H5/H7 surveillance (LPAI).

6.1.3 Release of Quarantine and Movement Control

6.1.3.1 RELEASE OF CONTROL AREA

IC and State Animal Health Officials need to plan for the release of the CA (and associated movement controls) when the CA is established under a State-Federal Unified IC. The specifics of CA release will be indicated by the epidemiology of the outbreak, however, the following conditions must be met:

- ◆ The last IP in the CA has been depopulated.
- ◆ Disposal has been completed (in the case of composting, the compost pile must be set).
- ◆ Surveillance tests indicate no HPAI infection in the CA.
- ◆ Surveillance requirements for international or bilateral trade are being conducted and will continue to be conducted (based on the density of poultry, epidemiological information, species, and commodity).

The Unified IC will specify other conditions for CA release, which may include at least initial disinfection of all equipment, fomites, and accessible areas of the houses (i.e., avoiding the compost pile). The CA may be released prior to the date in which restocking is allowed on the last IP.

6.1.3.2 RELEASE OF FEDERAL QUARANTINE

In the event that a Federal quarantine is implemented under Federal authority, a Federal Register notice will be published notifying of quarantine release. The Federal quarantine area or region may or may not be the same as the CA.

6.1.3.3 RELEASE OF QUARANTINE ON INFECTED PREMISES

IP may remain under quarantine even when the CA has been released. If IP are under quarantine based on State authority, the SAHO is responsible for releasing the quarantine based on the evidence and requirements established by the State. This process should consider how quarantined premises are evaluated for HPAI freedom and how the quarantine is released (by sections, by premises, by risk, or in entirety).

6.1.4 Disposition of Vaccinates

If vaccination was used in the outbreak, HPAI vaccinates will still be subject to movement control and monitoring measures.

6.1.5 Country Freedom Declaration

The United States will apply to the OIE after meeting OIE requirements. HPAI-free status requires formal submission detailing the HPAI policy, eradication procedures, surveillance and monitoring of vaccinates, veterinary infrastructure, industry organization, and, if vaccination has been used, the tracing system for vaccinates. Acceptance of the claim for country freedom may also involve an inspection by an international panel to review the eradication program and all available information to verify HPAI freedom.

6.2 REPOPULATION

The total time in which it takes a premises to go from an IP with sick birds to a restocked premises will vary based on the type of premises, epidemiology of the outbreak, location of other HPAI IP, evidence provided to State and APHIS officials, and method of disposal. Restocking can take place before the end of the outbreak, under conditions established by the IC.

Even after specific requirements are met, such as a vacancy period and cleaning and disinfection, there can be additional criteria imposed by IC and/or State and APHIS officials prior to restocking: this may include stringent and additional biosecurity measures. There may be a distinction between being “eligible” for restocking and “approved” for restocking—the latter means IC, State, *and* APHIS officials agree that the premises should restock, while the former simply means that the premises has met basic requirements.

A primary goal of the HPAI response is to ensure that the response efforts and activities do not cause more damage and disruption than the disease outbreak itself. However, restocked premises that subsequently become infected with HPAI a second time place significant additional stress on constrained resources and continue the risk of ongoing HPAI transmission. Therefore, appropriate caution is urged in restocking premises. Depending on outbreak-specific circumstances, APHIS may not indemnify premises that are restocked without APHIS and State approval that subsequently become re-infected.

6.2.1 Environmental Sampling

Environmental sampling will be required of the premises prior to restocking activities. It typically occurs during the 21 day fallow (vacant) period. Personnel taking environment samples should continue to follow biosecurity and PPE procedures as indicated by the IC. In the event that houses are left vacant for an extended period (60 day or more), the IC may decide environmental sampling is not necessary, depending on ambient temperature, outbreak epidemiology, and other factors.

6.2.2 Commercial Premises that Can't Be Cleaned

In the unusual circumstance in which commercial premises cannot be cleaned and disinfected, fallowing for 120-days—or a period recommended by IC—is prescribed. The length of this period will vary depending on temperature and season. Fallowing should be reserved for premises that would need to be completely repaired or destroyed in order to be effectively cleaned and disinfected. Premises that cannot be cleaned would still need to meet the requirements set by IC to be eligible to restock, and their restocking would need to be approved by State and APHIS officials. Environmental testing will still be required.

6.2.3 Restocking Guidance

Following official approval of all cleaning and disinfection procedures, IP remain fallow (vacant without birds) for a minimum of 21 days to ensure that any residual virus has been eliminated from the houses and other areas of the premises. Under certain conditions, the IC may decide this 21-day period following disinfection procedures can be slightly decreased based on ambient temperature, length of time before disinfection was completed, type of disinfection procedures carried out on the premises, and further assessment of risk. However, 21 days remains the common standard for fallowing after HPAI disinfection procedures.

6.2.4 Approved Sources of Poultry

Source flocks for all introduced poultry must test negative through rRT-PCR and other diagnostics, as determined by IC: usually 2 negative rRT-PCR tests are required at least 24 hours apart, with one test within 24 hours of movement. A 24-hour pre-movement clinical inspection is also required.

6.2.5 Testing Requirements after Restocking

Birds placed into previously infected houses or premises may be subjected to further diagnostic testing at the discretion of State and/or APHIS officials.

Appendix A

Foreign Animal Disease Preparedness and Response Plan Materials to Support HPAI Response

This appendix provides a broad overview of the Foreign Animal Disease Preparedness and Response Plan (FAD PReP), and lists the FAD PReP documents that support this *Highly Pathogenic Avian Influenza (HPAI) Response Plan (2015)*. The new and revised documents may be useful for stakeholders in preparedness and response planning related to HPAI. Most of these documents have been released, others are forthcoming. These resources are found online at www.aphis.usda.gov/fadprep.

OVERVIEW OF FAD PReP

FAD PReP Mission and Goals

The significant threat and potential consequences of foreign animal diseases (FADs) and the challenges and lessons-learned of effective and rapid FAD response have led to the development of FAD PReP. The mission of FAD PReP is to raise awareness, build expectations, and develop capabilities surrounding FAD preparedness and response. The goal of FAD PReP is to integrate, synchronize, and deconflict preparedness and response capabilities as much as possible before an outbreak by providing goals, guidelines, strategies, and procedures that are clear, comprehensive, easily readable, easily updated, and that comply with the National Incident Management System.

In the event of an FAD outbreak, the three key response goals are to: (1) detect, control, and contain the FAD in animals as quickly as possible; (2) eradicate the FAD using strategies that seek to stabilize animal agriculture, the food supply, the economy, and that protect public health and the environment; and (3) provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products. In summary, achieving these three goals will allow individual livestock and poultry facilities, States, Tribes, regions, and industries to resume normal production as quickly as possible. They will also allow the United States to regain FAD-free status without the response effort causing more disruption and damage than the disease outbreak itself.

FAD PReP Documents and Materials

FAD PReP is a comprehensive U.S. preparedness and response strategy for FAD threats, both zoonotic and non-zoonotic. Types of FAD PReP documents include:

- ◆ Strategic Plans—Concept of Operations
- ◆ National Animal Health Emergency Management System (NAHEMS) Guidelines
- ◆ Industry Manuals
- ◆ Disease Response Plans
- ◆ Standard Operating Procedures (SOPs) for Critical Activities
- ◆ Continuity of Business Plans (commodity specific plans developed by public-private-academic partnerships)
- ◆ Ready Reference Guides.

Lessons Learned from Past Outbreaks

The foundation of FAD PReP is lessons learned in successfully managing past FAD incidents. FAD PReP is based on the following:

- ◆ Achieving rapid FAD detection and tracing.
- ◆ Providing processes for emergency planning that respect local knowledge.
- ◆ Integrating State-Federal-Tribal-industry planning processes.
- ◆ Ensuring that there are clearly defined, obtainable, and unified goals for response.
- ◆ Having a Unified Command with a proper delegation of authority that is able to act with speed and certainty.
- ◆ Employing science and risk-based management approaches to FAD response.
- ◆ Ensuring that all guidelines, strategies, and procedures are communicated effectively to responders and stakeholders.
- ◆ Identifying resources and trained personnel required for an effective incident response.

- ◆ Trying to resolve competing interests prior to an outbreak and addressing them quickly during an outbreak.

HPAI CONTINUITY OF BUSINESS PLANNING

- ◆ *Secure Egg Supply Plan* (www.secureeggssupply.com)
- ◆ *Secure Turkey Supply Plan* (www.secureturkeysupply.com)
- ◆ *Secure Broiler Supply Plan* (www.securebroilersupply.com).

HPAI CRITICAL ACTIVITIES & SOPs

There are 23 critical activities conducted during a response to HPAI. Many of these activities have associated SOPs. These SOPs are templates to provide a common picture or set of procedures for the following 23 tools and strategies:

1. Overview of Etiology and Ecology
2. Case Definition Development Process
3. Surveillance
4. Diagnostics (Sample Collection, Surge Capacity, and Reporting)
5. Epidemiological Investigation and Tracing
6. Overview of Information Management
7. Communications
8. Health and Safety and Personal Protective Equipment
9. Biosecurity
10. Quarantine and Movement Control
11. Continuity of Business
12. Overview of Regionalization for International Trade
13. Mass Depopulation and Euthanasia
14. Disposal
15. Cleaning and Disinfection
16. Vaccination

-
17. Logistics
 18. Overview of Wildlife Management and Vector Control
 19. Overview of Animal Welfare
 20. Overview of Modeling and Assessment Tools
 21. Appraisal and Compensation
 22. Overview of Finance
 23. Overview of Incident Management.

READY REFERENCE GUIDES

- ◆ HPAI Response
 - Overview of the HPAI Response Plan
 - Overview of Zones
- ◆ General Response for all FADs
 - Introduction to FAD PReP
 - Introduction to the Emergency Management Response System (EMRS) 2
 - Understanding the EMRS 2 Interface
 - FAD Framework: Roles and Coordination
 - FAD Framework: Response Strategies
 - Critical Activities and Tools During an FAD Response
 - Secure Food Supply Plans
 - Zones, Areas, and Premises in an FAD Outbreak
 - Movement Control in an FAD Outbreak
 - VS Guidance 12001: Procedures and Policy for the Investigation of Potential FAD/Emerging Disease Incidents

INDUSTRY MANUAL

Poultry

NATIONAL ANIMAL HEALTH EMERGENCY MANAGEMENT SYSTEM GUIDELINES

- ◆ Biosecurity
- ◆ Cleaning and Disinfection
- ◆ Continuity of Business
- ◆ Disposal
- ◆ Health and Safety
- ◆ Information Management
- ◆ Mass Depopulation and Euthanasia
- ◆ Personal Protective Equipment
- ◆ Surveillance, Epidemiology, and Tracing
- ◆ Quarantine and Movement Control
- ◆ Vaccination for Contagious Diseases
- ◆ Wildlife Management and Vector Control for an FAD Response in Domestic Livestock

STRATEGIC PLANS—CONCEPT OF OPERATIONS

- ◆ *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0)
- ◆ *APHIS Foreign Animal Disease Framework: Response Strategies* (FAD PReP Manual 2-0)
- ◆ *Incident Coordination Group Plan* (FAD PReP Manual 3-0)
- ◆ *FAD Investigation Manual* (FAD PReP Manual 4-0)
- ◆ *A Partial List of FAD Stakeholders* (FAD PReP Manual 5-0).

Appendix B

Laboratory Network List for Avian Influenza

National Animal Health Laboratory Network (NAHLN) laboratories are listed at www.aphis.usda.gov/animal_health/nahln/downloads/ai_lab_list.pdf. This list was last updated in July 6, 2015. The following laboratories can currently perform testing for avian influenza after National Veterinary Services Laboratory confirmation of highly pathogenic avian influenza.

Table B-1. Avian Influenza National Animal Health Laboratory Network Laboratories

#	State	Laboratory	Phone Numbers
1	Alabama	Thompson-Bishop-Sparks State Diagnostic Laboratory 890 Simms Road Auburn, AL 36832	334-844-4987 Fax 334-844-7206
2	Arkansas	Arkansas Livestock & Poultry Commission Laboratory One Natural Resources Drive Little Rock, AR 72205	501-907-2430 Fax 501-907-2410
3	Arizona	Arizona Veterinary Diagnostic Laboratory 2831 North Freeway Tucson, AZ 85705	520-621-2356 Fax 520-626-8696
4	California	California Animal Health & Food Safety Laboratory University of California, School of Veterinary Med 620 West Health Science Drive Davis, CA 95616	530-752-8709 Fax 530-752-5680
5	Colorado	Colorado State University Veterinary Diagnostic Laboratory 300 West Drake Road, Building C Fort Collins, CO 80523-1644	970-297-1281 Fax 970-297-0320
6	Connecticut	Connecticut Veterinary Medical Diagnostic Laboratory University of Connecticut, Unit 3089 61 North Eagleville Road Storrs, CT 06269-3089	860-486-3738 Fax 860-486-2737
7	Delaware	Charles C. Allen Biotechnology Laboratory Department of Animal & Food Sciences, University of Delaware 531 South College Avenue, Room 44 Townsend Hall Newark, DE 19716-2150	302-831-2524 Fax 302-831-2822
8	Delaware	University of Delaware Lasher Laboratory 16483 County Seat Highway Georgetown, DE 19947	302-856-0046 ext. 700 or 702
9	Florida	Bronson Animal Disease Diagnostic Laboratory Florida Department of Agriculture and Consumer Services 2700 N. John Young Parkway Kissimmee, FL 34741	321-697-1423 Fax 321-697-1467

Table B-1. Avian Influenza National Animal Health Laboratory Network Laboratories

#	State	Laboratory	Phone Numbers
10	Georgia	Athens Veterinary Diagnostic Laboratory 501 DW Brooks Drive University of Georgia Athens, GA 30602	706-542-5568 Fax 706-542-5977
11	Georgia	Georgia Poultry Laboratory Network 4457 Oakwood Road Oakwood, GA 30566	770-535-5996
12	Georgia	University of Georgia Tifton Veterinary Diagnostic Laboratory 43 Brighton Road Tifton, GA 31793-3000	229-386-3340 Fax 229-386-3399
13	Hawaii	State Laboratories Division 2725 Waimano Home Road Pearl City, HI 96782	808-453-6650 Fax 808-453-5995
14	Iowa	Iowa State University Veterinary Diagnostic Laboratory 1600 S. 16th Street Ames, IA 50011	515-294-1950 Fax 515-294-3564
15	Illinois	Illinois Department of Agriculture Galesburg Animal Disease Laboratory 2100 S Lake Storey Rd Galesburg, IL 61401	309-344-2451 Fax 309-344-7358
16	Illinois	University of Illinois Veterinary Diagnostic Laboratory Veterinary Diagnostic Laboratory 2001 S. Lincoln Urbana, IL 61802-6199	217-333-2123 Fax 217-244-2439
17	Indiana	Indiana Animal Disease Diagnostic Laboratory at Purdue University 406 South University Street West Lafayette, IN 47907	765-494-7440 Fax 765-494-9181
18	Kansas	Kansas State Veterinary Diagnostic Laboratory Kansas State University, CVM L232 Mosier Hall, 1800 Dennison Avenue Manhattan, KS 66506	785-532-4454 Fax 785-532-4039
19	Kentucky	Breathitt Veterinary Center Murray State University 715 North Drive Hopkinsville, KY 42240	270-886-3959 Fax 859-255-1624
20	Kentucky	University of Kentucky, Veterinary Diagnostic Laboratory 1490 Bull Lea Road Lexington, KY 40511	859-257-7489 Fax 859-255-1624
21	Louisiana	Louisiana Animal Disease Diagnostic Laboratory River Road, Room 1043 Baton Rouge, LA 70803	225-578-9777 Fax 225-578-9784
22	Maryland	Frederick Animal Health Laboratory 1840 Rosemount Avenue Frederick, MD 21702	301-600-1548 Fax 301-600-6111

Table B-1. Avian Influenza National Animal Health Laboratory Network Laboratories

#	State	Laboratory	Phone Numbers
23	Maryland	Maryland Department of Agriculture Salisbury Animal Health Laboratory 27722 Nanticoke Road Salisbury, MD 21801	410-543-6610 Fax 410-543-6676
24	Michigan	Diagnostic Center for Population and Animal Health Michigan State University 4125 Beaumont Road, Suite 201H Lansing, MI 48910	517-353-1683 Fax 517-432-5836
25	Minnesota	University of Minnesota Veterinary Diagnostic Laboratory 1333 Gortner Avenue, 244 Vet D L St. Paul, MN 55108	612-625-8787 Fax 612-624-8707
26	Missouri	Missouri Department of Agriculture Veterinary Diagnostic Laboratory 701 North Miller Avenue Springfield, MO 65802	573-751-3377
27	Missouri	Veterinary Medical Diagnostic Laboratory 1600 East Rollins Columbia, MO 65211	573-882-8122 Fax 573-882-1411
28	Mississippi	Mississippi Veterinary Research & Diagnostic Laboratory 3137 Hwy 468 West Pearl, MS 39208	601-420-4700 Fax 601-420-4719
29	Montana	Montana Veterinary Diagnostic Laboratory Marsh Laboratory, 1911 West Lincoln Bozeman, MT 59771	406-994-6388 Fax 406-994-6344
30	North Carolina	Rollins Diagnostic Laboratory North Carolina Department of Agriculture 2101 Blue Ridge Road Raleigh, NC 27607	919-733-3986 Fax 919-733-0454
31	North Dakota	Veterinary Diagnostic Laboratory North Dakota State University NDSU Dept. 7691 Fargo, ND 58108-6050	701-936-1433 Fax 701-231-7514
32	Nebraska	University of Nebraska–University of Nebraska Veterinary Diagnostic Center East Campus Loop and Fair Street Lincoln, NE 68583-0907	402-472-1434 Fax 402-472-3094
33	New Jersey	New Jersey Department of Agriculture, Division of Animal Health Animal Health Diagnostic Laboratory, NJPHEAL 3 Schwarzkopf Drive Ewing, NJ 08628	609-406-6999 Fax 609-671-6414
34	New York	Animal Health Diagnostic Center 240 Farrier Road College of Vet Med, Cornell University Ithaca, NY 14853	607-253-4271
35	Ohio	Ohio–Animal Disease Diagnostic Laboratory–Ohio Department of Agriculture 8995 East Main Street, Building 6 Reynoldsburg, OH 43068	614-728-6220 Fax 614-728-6310

Table B-1. Avian Influenza National Animal Health Laboratory Network Laboratories

#	State	Laboratory	Phone Numbers
36	Oklahoma	Oklahoma Animal Disease Diagnostic Laboratory Oklahoma State Univ., College of Vet. Med. Farm & Ridge Road Stillwater, OK 74078	405-744-8808 Fax 405-744-8612
37	Oregon	Oregon State University Veterinary Diagnostic Laboratory Magruder Hall 134 Corvallis, OR 97331	541-737-6964 Fax 541-737-6817
38	Pennsylvania	Pennsylvania State University, Animal Diagnostic Laboratory Orchard Road University Park, PA 16802	814-863-5939 Fax 814-865-3907
39	Pennsylvania	Pennsylvania Veterinary Laboratory Pennsylvania Department of Agriculture 2305 N. Cameron Street Harrisburg, PA 17110	717-787-8808 Fax 717-772-3895
40	Pennsylvania	University of Pennsylvania, School of Vet. Med., New Bolton Center, PADLS 382 West Street Road Kennett Square, PA 19348-1692	610-444-5800 Fax 610-925-6806
41	South Carolina	Clemson Veterinary Diagnostic Center 500 Clemson Road Columbia, SC 29229	803-726-7827 Fax 803-788-8058
42	South Dakota	Animal Disease Research & Diagnostic Laboratory South Dakota State University N. Campus Drive Brookings, SD 57007	605-688-6643 Fax 605-688-6003
43	Tennessee	Kord Animal Disease Diagnostic Laboratory TN Dept of Agriculture 436 Hogan Road Nashville, TN 37220	615-837-5294 Fax 615-837-5250
44	Texas	Department of Defense Veterinary Food Analysis and Diagnostic Laboratory 2899 Schofield Road, Suite 2630 JB SA Ft Sam Houston, TX 78234	210-295-4604
45	Texas	Texas A&M Veterinary Medical Diagnostic Laboratory 1 Sippel Road, Drawer 3040 College Station, TX 77843	979-845-3414 Fax 979-845-1794
46	Texas	Texas A&M Veterinary Medical Diagnostic Laboratory–Amarillo 6610 Amarillo Blvd West Amarillo, TX 79106	806-353-7478 Fax 806-359-0636
47	Texas	Texas A&M Veterinary Medical Diagnostic Laboratory–Center 635 Malone Drive Center, TX 75935	936-598-4451 Fax 936-598-2741
48	Texas	Texas A&M Veterinary Medical Diagnostic Laboratory–Gonzales 1162 East Sarah DeWitt Drive Gonzales, TX 78629	830-672-2834 Fax 830-672-2835
49	Utah	Utah Veterinary Diagnostic Laboratory 950 E. 1400 North Logan, UT 84341	435-797-1883 Fax 435-797-2805

Table B-1. Avian Influenza National Animal Health Laboratory Network Laboratories

#	State	Laboratory	Phone Numbers
50	Virginia	VDACS Harrisonburg Regional Laboratory Animal Health Lab 261 Mt. Clinton Pike Harrisonburg, VA 22802	804-692-0604 Fax 540-434-3880
51	Washington	Washington Animal Disease Diagnostic Laboratory Bustad Hall, Room 155-N Pullman, WA 99164	509-335-9696 Fax 509-335-7424
52	Washington	Washington Animal Disease Diagnostic Laboratory Avian Health and Food Safety Laboratory, Puyallup 2607 W Pioneer Puyallup, WA 98371-4919	253-445-4537 Fax 253-445-4544
53	Wisconsin	USGS National Wildlife Health Center 6006 Schroeder Road Madison, WI 53711	608-270-2401 Fax 608-270-2415
54	Wisconsin	Wisconsin Veterinary Diagnostic Laboratory 445 Easterday Lane Madison, WI 53706	608-262-5432 Fax 847-574-8085
55	West Virginia	West Virginia Department of Agriculture, Poultry Health Division– Moorefield Animal Health Diagnostic Laboratory 60B Moorefield Industrial Park Moorefield, WV 26836	304-257-8973 Fax 304-538-8133
56	Wyoming	Wyoming State Veterinary Laboratory 1174 Snowy Range Road Laramie, WY 82070	307-766-9929 Fax 307-721-2051

Appendix C

Overview of Secure Egg Supply Plan

The *Secure Egg Supply (SES) Summary Plan* is located at www.secureeggsupply.com and www.aphis.usda.gov/fadprep. This appendix provides a brief overview of the *SES Plan*.

SUMMARY

The *SES Plan* promotes food security and animal health through continuity of market planning for a highly pathogenic avian influenza (HPAI) outbreak. This plan makes specific science- and risk-based recommendations that emergency decision makers (such as Incident Commanders) can use to rapidly decide whether to issue or deny permits for the movement of egg industry products during an HPAI outbreak.

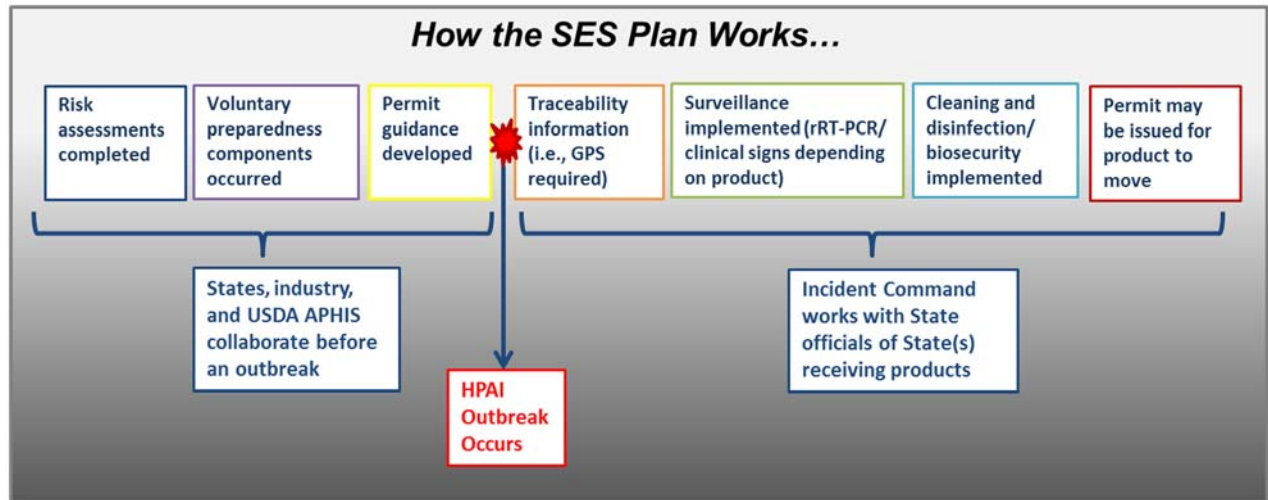
The Egg Sector Working Group—a multidisciplinary team—prepared the *SES Plan*. This team includes the following:

- ◆ University of Minnesota Center for Animal Health and Food Safety (CAHFS)
- ◆ Iowa State University Center for Food Security and Public Health (CFSPH)
- ◆ United Egg Producers
- ◆ United Egg Association
- ◆ Egg sector veterinarians, officials, and representatives
- ◆ State officials
- ◆ The USDA Animal and Plant Health Inspection Service, Veterinary Services (USDA APHIS VS).

The *SES Plan* is based on current research and practice in fields including virology, flock husbandry, epidemiology, and risk-assessment. The *SES Plan* uses science- and risk-based preparedness and response components (see Figure C-1) to provide guidance on permitting the movement of egg industry products from a Control Area during an HPAI outbreak. Simultaneously, these recommendations effectively manage the risk of HPAI transmission to naïve premises. Through the integrated implementation of the components listed in Figure C-1, this plan

provides a high degree of confidence that egg industry products moved into market channels do not contain HPAI virus.

Figure C-1. Process of the SES Plan and Secure Food Supply Plans



The *SES Plan* focuses on permit guidance for pasteurized liquid egg, non-pasteurized liquid egg, washed and sanitized shell eggs, nest run shell eggs, layer hatching eggs, and layer day-old chicks (Table C-1). Guidance for other products, such as dry eggshells, is found in the *SES Plan*.

Specific criteria must be fulfilled to qualify for movement permits. Movement is allowed by permit for products from flocks inside a Control Area that meet epidemiological and biosecurity standards, which for some products includes one or more negative rRT-PCRs for HPAI.

Additional components, including surveillance guidelines, product specific biosecurity practices, cleaning and disinfection guidelines, cleaning and disinfection checklists, proactive product-specific risk assessments, permit examples, and the voluntary preparedness components (epidemiological assessment and biosecurity checklist), can be found at <http://secureeggsupply.com>.

Table C-1. Summary of SES Plan Permitting

Product	The proactive risk assessment for movement is:	And traceability information (premises ID, GPS coordinates, or other) is available:	And production parameters are normal:	And the following biosecurity measures are in place (please see the product-specific sections for the list of steps involved in each of these measures):	And the premises biosecurity is acceptable?	And the epidemiological assessment is acceptable?	And the rRT-PCR result is negative?	Action:	Permit guidance to move product:	And the second rRT-PCR result is negative?	Action:	Permit guidance to move product:
Pasteurized liquid egg	Negligible	YES	YES	1. Truck and driver biosecurity		These steps are not required for this product.						Issue PERMIT to move to market
Non-pasteurized liquid egg	Negligible	YES	YES	1. Truck and driver biosecurity	NA (not applicable)	NA	YES	➔	Issue PERMIT to move to pasteurization	Non-pasteurized liquid egg becomes pasteurized liquid egg		
Washed and sanitized shell eggs (to premises without poultry)	Negligible	YES	YES	1. Truck and driver biosecurity 2. Product-specific biosecurity	YES	YES	YES	➔	Issue PERMIT to move off premises to a storage or holding area	YES	➔	Issue PERMIT to move to market for eggs collected 2 days earlier
Washed and sanitized shell eggs (to premises with poultry)	Low	YES	YES	1. Truck and driver biosecurity 2. Product-specific biosecurity	YES	YES	YES	➔	Issue PERMIT to move off premises to a storage or holding area	YES	➔	Issue PERMIT to move to market for eggs collected 2 days earlier
Nest run shell eggs	Low	YES	YES	1. Truck and driver biosecurity 2. Product-specific biosecurity	YES	YES	YES	➔	No PERMIT issued until 2 negative rRT-PCR tests	YES	➔	Issue PERMIT to move to processing for eggs collected 2 days earlier (can move immediately to market after processing)
Layer hatching eggs	Low	YES for both the breeder farm and the hatchery	YES	1. Truck and driver biosecurity 2. Product-specific biosecurity	YES	YES	YES	➔	No PERMIT issued until 2 negative rRT-PCR tests	YES	➔	Issue PERMIT to move to hatchery or processing for eggs collected 2 days earlier
Layer day-old chicks	Low	YES for both the hatchery and the pullet farm	NA	1. Truck and driver biosecurity 2. Product-specific biosecurity 3. No eggs from rRT-PCR positive breeder flocks in hatchery egg room	YES	YES	NA		NA	NA		Issue PERMIT to move layer day-old chicks to pullet farm; 21-day quarantine at pullet premises

Appendix D

Updated Example HPAI Outbreak Surveillance Guidance and Rationale for Poultry

EXAMPLE HPAI OUTBREAK SURVEILLANCE GUIDELINES FOR POULTRY

These guidelines are updated recommendations for highly pathogenic avian influenza (HPAI) outbreak surveillance, prepared by Veterinary Services, Animal and Plant Health Inspection Service (APHIS). These guidelines take into account lessons learned from the 2014-2015 HPAI outbreak, and may be updated at any time. These guidelines are to serve as an example, and provide sample surveillance schemes that can be used by Incident Command (IC) to develop appropriate surveillance plans using the most current scientific information and best practice guidance available.

Purpose

These guidelines provide recommendations for surveillance activities in domestic poultry for this *HPAI Response Plan*. These guidelines are sample guidelines, and may evolve based on epidemiological evidence or other factors. Surveillance is conducted at intervals as specified by IC. APHIS collaborates with public health agencies regarding the threat of HPAI to humans.

This guidance offers recommendations for surveillance activities focused on disease-detection, and provides example sampling sizes and sampling frequencies for premises located in the Control Area (CA), which includes the Infected Zone (IZ) and Buffer Zone (BZ). Additional surveillance is conducted in the Surveillance Zone (SZ), which is part of the Free Area (FA).

These guidelines do not specifically or comprehensively address surveillance for continuity of business in an outbreak; for example, surveillance testing for daily bird or product movement from layer, broiler, or turkey flocks. For more information on surveillance testing required for business continuity, please see the Secure Egg Supply Plan (www.secureeggssupply.com), Secure Broiler Supply Plan (www.securebroilersupply.com), and Secure Turkey Supply Plan (www.secureturkeysupply.com).

Objectives

The objectives of HPAI outbreak surveillance are to

- ◆ detect HPAI Infected Premises (IP) during an outbreak;
- ◆ determine the size and extent of an HPAI outbreak;
- ◆ supply information to evaluate outbreak control activities;
- ◆ provide information for animal and product movement within the CA;
- ◆ provide information for animal and product movement out of the CA; and
- ◆ prove disease freedom (DF) and regain disease-free status after eradication of the outbreak.

[Section 5.3](#) provides additional objectives by time period (i.e., immediately after outbreak declaration to providing evidence of DF).

Definitions

There are four key definitions that are important in outbreak surveillance.

- ◆ *Dead Birds* are the dead or euthanized sick birds found each day in every house on a premises.
- ◆ *50-Dead-Bird Group* consists of 50 or fewer dead birds (and each multiple of 50 or fewer dead birds) from each house on the premises each day.
- ◆ *5-Bird (or 11-Bird) Pool* combines samples taken from five dead or euthanized sick birds out of the house's (flock's) daily dead birds into one sample. In all cases where a 5-bird pool is mentioned, an 11-bird pool (samples taken from 11 dead or euthanized sick birds) may be collected instead. This is an additional option for sampling.
- ◆ *Detection Probability* is the probability that the sampling scheme will detect at least 1 infected bird of each 50-dead-bird group (at the 95 percent confidence level) if there are 20 or more infected birds (40 percent prevalence) in the target population of daily dead birds, where the real-time reverse transcriptase polymerase chain reaction (rRT-PCR) test sensitivity of the 5-bird pool is 86.5 percent.

Rationale for the 20-Bird Detection Prevalence

The following reasons provide the rationale for the 20-bird detection prevalence threshold:

- ◆ It is rapidly exceeded because HPAI quickly spreads throughout a house, killing many birds.
- ◆ It may reduce the number of days that the premises are infectious by at least 48 hours.¹
- ◆ It is logistically feasible, flexible, simple, and standardized.
- ◆ It is consistent with surveillance schemes used for disease detection, business continuity, and proof of DF.

SAMPLING SCHEME PROCEDURES FOR POULTRY

1. Start sampling immediately or as quickly as possible upon HPAI outbreak response authorization.
2. Implement sampling schemes for rapid disease detection.

Surveillance Sampling Schemes

The following sampling unit is used for both commercial and backyard premises.

- ◆ *Sampling Unit:* Flock or house.
- ◆ *Sample:* A pooled sample that combines swabs taken from 5 or 11 dead or euthanized sick birds out of the house's (flock's) daily dead or ill birds.
 - The frequency recommendations for premises (that are not moving birds or products daily) are based on
 - the short incubation period (2–3 days) of HPAI;
 - sufficient available personnel for surveillance activities;
 - decreased probability of spreading HPAI with frequent inspection or sampling;
 - recommendations for changing frequency of premises inspection or sampling as listed in Table D-3; and
 - recommendations for sampling frequency of live birds without clinical signs, in instances where flock sizes are small and daily mortality is limited as listed in Table D-4.

¹ For the current mortality triggers for HPAI, please see the Case Definition for H5/H7 Avian Influenza in [Section 5.2.2.1](#).

Example Disease Detection Surveillance Scheme

Please see Table D-1 for a summary of this section.

COMMERCIAL PREMISES

Infected Zone

- ◆ Census of premises within zone; sample premises as prioritized by epidemiological investigation and continuity of business requirements.
- ◆ If HPAI compatible signs are observed or epidemiological links found: collect swabs for the 5-bird pool(s) from each 50-dead-bird group from each flock on the premises.²
- ◆ Sampling frequency:
 - Suspect Premises (SP) is a temporary designation; these premises should be reclassified prior to sampling activities.
 - Contact Premises (CP) and Monitored Premises (MP):
 1. Collect swabs for the 5-bird pool sample(s) on each premises every other day for 14 days, or similar sampling frequency depending on resources available.³
 2. CP or MP that test negative in the above sampling regime may be sampled as described for At-Risk Premises (ARP).
 3. MP may be sampled more frequently depending on the need to ship product but at the minimum must be sampled as listed above.
 - ARP:
 - Collect swabs for the 5-bird pool(s) on each premises once every 5-7 days for the duration of the quarantine⁴, or similar sampling frequency depending on resources available.

² Please note that an 11-bird pool is a sampling option; these sections use the 5-bird pool as an example.

³ This assumes an HPAI viral strain with a shorter incubation period of an average of 2–3 days. However, some HPAI strains suggest a week-long incubation period, so to be conservative it is best to use the 14-day period. If the incubation period of the strain is longer, this sampling frequency will need to be adapted in reflection of the incubation period. Please see Table D-3.

⁴ In this case, and throughout this Appendix, “quarantine” refers to the establishment of the CA.

Buffer Zone

- ◆ Census of premises within zone; sample premises as prioritized by epidemiological investigation and continuity of business requirements.
- ◆ Sampling frequency:
 - SP is a temporary designation; these premises should be reclassified prior to sampling activities.
 - MP and CP:
 1. Collect swabs for the 5-bird pool sample(s) on each premises every other day for 14 days, or similar sampling frequency depending on resources available.⁵
 2. MP or CP that test negative in the above sampling regime may be sampled as described for ARP.
 3. MP may be sampled more frequently depending on need to ship product but at the minimum must be sampled as listed above.
 - ARP:
 - Collect swabs for the 5-bird pool(s) on each premises once every 5-7 days for the duration of the quarantine, or similar sampling frequency depending on resources available.⁶

Surveillance Zone

- ◆ SZ is in FA, and includes as much of the FA as necessary by epidemiological situation.
- ◆ Number of premises to be sampled:
 - Calculate the number of premises to be sampled:
 - The number of premises to be sampled may be based on detecting at least one IP with 95 percent confidence, where the IP prevalence equals or exceeds 5 percent of all premises with susceptible birds;

⁵ This assumes an HPAI viral strain with a shorter incubation period of an average of 2–3 days. However, some HPAI strains suggest a week-long incubation period, so to be conservative it is best to use the 14-day period. If the incubation period of the strain is longer, this sampling frequency will need to be adapted in reflection of the incubation period. Please see Table D-3.

⁶ The ARP in the BZ and IZ are sampled with the same frequency because infected but undetected premises in the BZ have higher consequences when not detected than those in the IZ (see *Assumptions for Example Surveillance Schemes* section later in this document).

-
- A census approach can be used if the number of premises within the zone is small.
 - Premises should be sampled as prioritized by epidemiological investigation and continuity of business requirements.
 - ◆ Sampling frequency:
 - Collect swabs for the 5-bird pool(s) on each of the selected premises once during the first 2 or 3-week period of the quarantine.
 - Sample an equal number of premises (as calculated above) once during each additional 2 to 3-week period of the quarantine.
 - For example, randomly select and sample 60 premises once during the first 2 to 3-week period, then reselect (with replacement) another 60 premises to be sampled in the second 2 to 3-week period for the duration of quarantine.
 - ◆ OR, active surveillance can be conducted on any movement of live poultry in the SZ (within the FA) as determined by the IC, APHIS, and State officials for 3-weeks or as indicated by the epidemiological situation.

BACKYARD PREMISES

The same sampling unit and sample is used in backyard premises as in commercial premises. However, please note the following:

- ◆ Swabs from different species should not be pooled; place them in separate tubes of media (even if this results in less than 5 oropharyngeal swabs per vial);
- ◆ Cloacal swabs may be used. However, cloacal swabs from all domestic waterfowl other than domestic ducks must be sampled singly, resulting in 1 cloacal swab per vial.
- ◆ Cloacal swabs from domestic ducks can be pooled, up to 5 swabs per vial.

In addition, there are likely to be less than 50 birds on any backyard premises. IC provides guidance on how many birds should be sampled on a premises given the total number of birds on that premises. Typically, if there are 10 or less birds, all should be sampled. For flocks of 50 or greater, a minimum of 20 birds should be sampled.

Infected Zone

- ◆ Census of premises within zone; sample premises as prioritized by epidemiological investigation and continuity of business requirements.
- ◆ Observe the flock for HPAI compatible signs.
- ◆ If HPAI compatible signs are observed or epidemiological links found: collect swabs from each flock on the premises.
- ◆ Observation and sampling frequency:
 - SP is a temporary designation; these premises should be reclassified prior to sampling activities.
 - CP:
 - Observe entire flock for HPAI signs (swab if there are any HPAI signs or epidemiological links) every other day for 1 week, or similar sampling frequency.
 - Frequency of observation and sampling depends on available personnel, number of premises to be sampled, owner resistance (hostility), owner volunteers for testing, and other factors.
 - The Incident Commander must balance premises' transmission risks and detection costs in deciding on observation/sampling frequency.
 - CP that test negative or have no signs of HPAI in the above observation and sampling regime and no epidemiological links may be observed as described for ARP.
 - ARP:
 - Observe entire flock (swab if there are HPAI signs or epidemiological links) on each premises once every 5–7 days for the duration of the quarantine, or similar sampling frequency as resources allow.

Buffer Zone

- ◆ Census of premises within zone; sample premises as prioritized by epidemiological investigation and continuity of business requirements.
- ◆ Observe the flock for HPAI compatible signs.
- ◆ If HPAI compatible signs are observed or epidemiological links found: collect swabs from each flock on the premises.

-
- ◆ Observation and sampling frequency:
 - SP is a temporary designation; these premises should be reclassified prior to sampling activities.
 - CP:
 - Observe entire flock for HPAI signs (swab if there are any HPAI signs) every other day for 1 week or similar sampling frequency.⁷
 - Frequency of observation and sampling depends on available personnel, number of premises to be sampled, owner resistance (hostility), owner volunteers for testing, and other factors.
 - The Incident Commander must balance premises' transmission risks and detection costs in deciding on observation/sampling frequency.
 - CP that test negative or that have no signs of HPAI in the above observation/sampling regime may be observed as described for ARP.
 - ARP:
 - Observe entire flock (swab if there are HPAI signs or epidemiological links) on each premises once every 5–7 days for the duration of the quarantine, or similar sampling frequency as resources allow.

Surveillance Zone

- ◆ SZ is in FA, and includes as much of the FA as necessary by epidemiological information.
- ◆ Observe the flock for HPAI compatible signs.
- ◆ If HPAI compatible signs are observed or epidemiological links found, collect swabs for the 5-bird pool from the dead birds in each flock on the premises.

⁷ This assumes an HPAI viral strain with a shorter incubation period of an average of 3–4 days. However, some HPAI strains suggest a week-long incubation period, so to be conservative it is best to use the 14-day period. If the incubation period of the strain is longer, this sampling frequency will need to be adapted in reflection of the incubation period. Please see Table D-3.

- ◆ Number of premises to be observed/sampled:
 - Calculate the number of premises to be observed/sampled:
 - The number of premises to be observed/sampled is based on detecting at least one IP with 95 percent confidence, where the IP prevalence equals or exceeds 5 percent of all premises with susceptible birds;
 - A census approach can be used if the number of premises within the zone is small.
 - Premises should be sampled as prioritized by epidemiological investigation and continuity of business requirements.
- ◆ Sampling frequency:
 - Collect swabs for the 5-bird pool(s) on each of the selected premises once during the first 2 or 3-week period of the quarantine.
 - Sample an equal number of premises (as calculated above) once during each additional 2 to 3-week period of the quarantine.
 - For example, randomly select and sample 10 backyard premises once during the first 2 to 3-week period, then reselect (with replacement) another 10 backyard premises to be sampled in the second 2 to 3-week period for the duration of quarantine.

Example Proof of Disease Freedom Surveillance Scheme

The definitions of “dead birds,” “50-dead-bird group,” “5-bird pool,” and “detection probability” remain the same. Also see Table D-2 which summarizes proof of DF surveillance for HPAI in poultry.

- ◆ Surveillance for proof of DF starts 21 days (World Organization for Animal Health [OIE] incubation period, as this is the international standard) after depopulation of last IP.
- ◆ The goal is to identify sero-positive farms that lack clinical signs. Clinically ill flocks are detected via increased surveillance methods listed below and investigation of flocks with suspicious signs.
- ◆ OIE recommends intensifying surveillance schemes. This is conducted in conjunction with surveillance of the CA through:
 - increasing the frequency of testing as stated in the National Poultry Improvement Plan,

-
- active investigation of flocks with suspicious clinical signs,
 - increasing the slaughter sero-surveillance, and
 - more use of sentinel flocks.
 - ◆ Additional or modified surveillance sampling may need to occur based on requirements to reestablish trade. These surveillance schemes are only examples.

COMMERCIAL PREMISES DISEASE FREEDOM

Infected Zone, Buffer Zone, and Surveillance Zone as One Unit

- ◆ Calculate number of premises to be sampled (serology and swabs of dead and euthanized sick birds):
 - The number of premises to be sampled is based on detecting at least one IP with 95 percent confidence, where
 - the IP prevalence equals or exceeds 5 percent of all premises with susceptible birds in the IZ.
- ◆ Calculate the number of samples per flock:
 - the IP prevalence equals or exceeds 15 percent where the maximum birds sampled doesn't exceed 60 birds per flock, and
 - one 5-bird pool sample is submitted for each 50-dead-bird group.
- ◆ Sampling frequency:
 - Sample the number of premises calculated above (for example, 60 premises one time each) during a 3-month period that begins not sooner than 21 days after depopulation of the last IP.
 - Sampling for DF may continue beyond this 3-month period.

BACKYARD PREMISES (DISEASE FREEDOM)

Infected Zone, Buffer Zone, and Surveillance Zone as One Unit

- ◆ Calculate number of premises to be sampled (serology and swabs of dead and euthanized sick birds; observation of healthy flocks):
 - The number of premises to be sampled is based on detecting at least one IP with 95 percent confidence, where
 - the IP prevalence equals or exceeds 5 percent of all premises with susceptible birds in the IZ.
- ◆ Calculate the number of samples per flock:
 - the IP prevalence equals or exceeds 15 percent where the maximum birds sampled doesn't exceed 60 birds per flock, and
 - one 5-bird pool sample is submitted for each 50-dead-bird group (many backyard premises have significantly fewer birds).
- ◆ Sampling frequency:
 - Sample the number of premises calculated above (for example, 30 premises one time each) during a 3-month period that begins not sooner than 21 days after depopulation of the last IP.
 - Sampling for DF may continue beyond this 3-month period.

EXAMPLE SURVEILLANCE FOR BIRD/PRODUCT MOVEMENT (NON-DAILY MOVEMENT REQUIREMENT)

- ◆ These are only guidelines, and may be modified by IC, State Animal Health Officials, and APHIS officials based on the prevailing epidemiological situation and movement requirements.
- ◆ Premises in the IZ or BZ that wish to move live poultry or poultry products may be required to be inspected and/or sampled prior to movement.
- ◆ The following is required *prior* to movement of live birds or poultry products from within the CA:
 1. Two, consecutive, negative 5-bird pool tests of birds to be moved or of the birds that produced the products to be moved.

2. One sample must be taken (with a negative test result) within 24 hours of movement.
3. If product is moving every day, customarily sampling is required every other day. Please see the Secure Food Supply Plans for more information on products that move daily (such as table eggs).

FURTHER SURVEILLANCE INFORMATION

Table D-1 summarizes the example outbreak surveillance scheme for disease detection.

Table D-1. Outbreak Surveillance for Disease Detection

Example for Disease Detection						
Post Outbreak Response Authorization						
	Commercial			Backyard		
Sampling	Infected Zone	Buffer Zone	Surveillance Zone	Infected Zone	Buffer Zone	Surveillance Zone
Number of Premises	Census	Census	5% Prevalence Threshold, or as IC recommends ^a	Census	Census	5% Prevalence Threshold, or as IC recommends ^a
Unit ^b	5-bird Pool	5-bird Pool	5-bird Pool	Observation then 5-bird Pool ^c	Observation then 5-bird Pool ^c	Observation then 5-bird Pool ^c
Frequency						
Free Premises	—		14–21 Days	—		14–21 Days
Monitored Premises	Every other day for 14 days or as IC/State/APHIS recommends		—	—		—
At-Risk Premises	5 to 7 Days ^d		—	5 to 7 Days ^d		—
Contact Premises ^{&}	Every other day for 14 days, or as IC recommends		—	Every other day for 14 days or as IC recommends		—
Product Movement	2 consecutive negative tests; one sample taken (with negative result) within 24 hours of movement ^e			2 consecutive negative tests; one sample taken (with negative result) within 24 hours of movement ^e		

^a Prevalence threshold is a predetermined proportion of IP (for example, 5 percent) used to calculate the number of premises to be sampled at a specific confidence level (for example, 95 percent) in a population of a given size (for example, 1,000 premises) based on detecting at least one IP.

^b Sampling Unit used in all Surveillance Schemes: One 5-bird pool (pooled swabs from five dead or euthanized sick birds) selected from each group of 50 or less daily dead or euthanized sick birds (and for each multiple of 50 or less dead or euthanized sick birds).

^c Initial visual observation only, swab upon observation of HPAI compatible signs. If the IC thinks that the flock needs sampling based on epidemiological information, they may also sample the flock.

^d Identical frequency of sampling in the IZ and BZ due to the need to detect undetected but IP in the BZ due to the high consequences of undetected IP in the BZ.

^e Two consecutive negative 5-bird pool tests are required before movement of birds or of the birds that produced

the product to be moved to achieve the 95 percent confidence level of detecting at least one infected 5-bird-pool.

Table D-2 shows the surveillance requirements to prove HPAI-freedom.

Table D-2. Surveillance for Proof of Disease Freedom

Example for Proof of Disease Freedom^a						
Post Outbreak Eradication						
	Commercial			Backyard		
Sampling	Infected Zone ^b	Buffer Zone ^b	Surveillance Zone ^b	Infected Zone ^b	Buffer Zone ^b	Surveillance Zone ^b
Number of Serology Samples per Premises	15% Prevalence Threshold ^c	15% Prevalence Threshold ^c	15% Prevalence Threshold ^c	15% Prevalence Threshold ^c	15% Prevalence Threshold ^c	15% Prevalence Threshold ^c
Number of Premises	5% Prevalence Threshold ^d	5% Prevalence Threshold ^d	5% Prevalence Threshold ^d	5% Prevalence Threshold ^d	5% Prevalence Threshold ^d	5% Prevalence Threshold ^d
Unit ^e	5-bird Pool	5-bird Pool	5-bird Pool	Observation 5-bird Pool	Observation 5-bird Pool	Observation 5-bird Pool
Frequency	Sample the number of premises calculated above (for example, 60 premises one time each) during a 3-month period that begins not sooner than 21 days after depopulation of the last Infected Premises. Sampling for DF may continue beyond this 3-month period.					

^a Sero-surveillance conducted in the area to be proved disease free in addition to dead bird sampling.

^b Infected, Buffer, and SZs combine as one unit for proof of DF.

^c Number of birds sero-sampled based on 15 percent prevalence in flock at the 95 percent confidence level where the maximum number of birds sampled per house does not exceed 60 birds.

^d Prevalence threshold is a predetermined proportion of IP (e.g., 5 percent) used to calculate the number of premises to be sampled at a specific confidence level (e.g., 95 percent) in a population of a given size (e.g., 1,000 premises) based on detecting at least one IP. A census of the premises in a zone will be sampled if there are few premises. Sample premises in order as by epidemiological investigation and continuity of business requirements.

^e Sampling Unit used in all Surveillance Schemes: One (1) 5-bird pool (pooled swabs from five dead or euthanized sick birds) selected from each group of 50 or less daily dead or euthanized birds (and for each multiple of 50 or less dead or euthanized sick birds).

Table D-3 shows the complexity of sampling based on the incubation period of the HPAI virus and feasible sampling frequency.

Table D-3. Influence of Incubation Period on Feasible Sample Collection Frequency

Example Estimated Incubation Period Based on Field Information*			
	Frequency of Sampling (days between sampling)		Sampling Duration (1 week minimum)
Incubation Period	Minimum (Days)	Maximum (Days)	Days
1–2 days	1	1	7
3–4 days	2	3	8
5–7 days	4	6	14
8–14 days	7	10	28
> 14 days	10		42

* The incubation periods for H7 and H5 HPAI viruses can vary widely. For example, H7 incubation periods are longer than H5 incubation periods.

Table D-4 shows the number of live, commercial birds that need to be sampled (the sample size) in order to detect at least one infected bird with 95 percent confidence assuming that exposure to the virus has been at least 3, 7, or 10 days past (as indicated in the table).

Table D-4. Sampling Frequency for Live, Commercial Birds without Clinical Signs (with 95 Percent Confidence)

Sample Size on Day 3, 7, 10 After Exposure			
Flock Size	Day 3	Day 7	Day 10
10	4	1	1
20	8	2	1
30	12	2	1
50	20	2	2
100	40	5	2
200	80	11	2
400	160	22	4
500	200	28	5
600	240	33	7
800	320	44	9
1,000	401	56	11
2,000	802	113	23
3,000	1,203	170	36
4,000	1,604	227	48
5,000	2,006	284	60

These estimates are based on a Reed-Frost transmission model where contact rate is defined as the 5th percentile of an expert opinion distribution (RiskPert[2.1,4.7,10.4])^a (i.e., having 95 percent confidence that the disease would have progressed to the point that enough birds would shed virus to allow detection of at least one if the test diagnostic sensitivity is 95 percent or greater). The calculation is based on approximation of the hypergeometric distribution^b assuming 0 positive detected out of the sample size shown above, where the number of birds shedding or dead are equal to the output of the transmission model.

^a National Avian Influenza Surveillance Plan, APHIS, 2007.

^b Cannon, R. M., and R. T. Roe, 1982: Livestock Disease Surveys: A Field Manual for Veterinarians. Australian Bureau of Animal Health, Canberra. Also see Cannon, R.M. 2001. Sense and Sensitivity-Designing Surveys Based on an Imperfect Test. Preventive Veterinary Medicine, 49, 141–163.

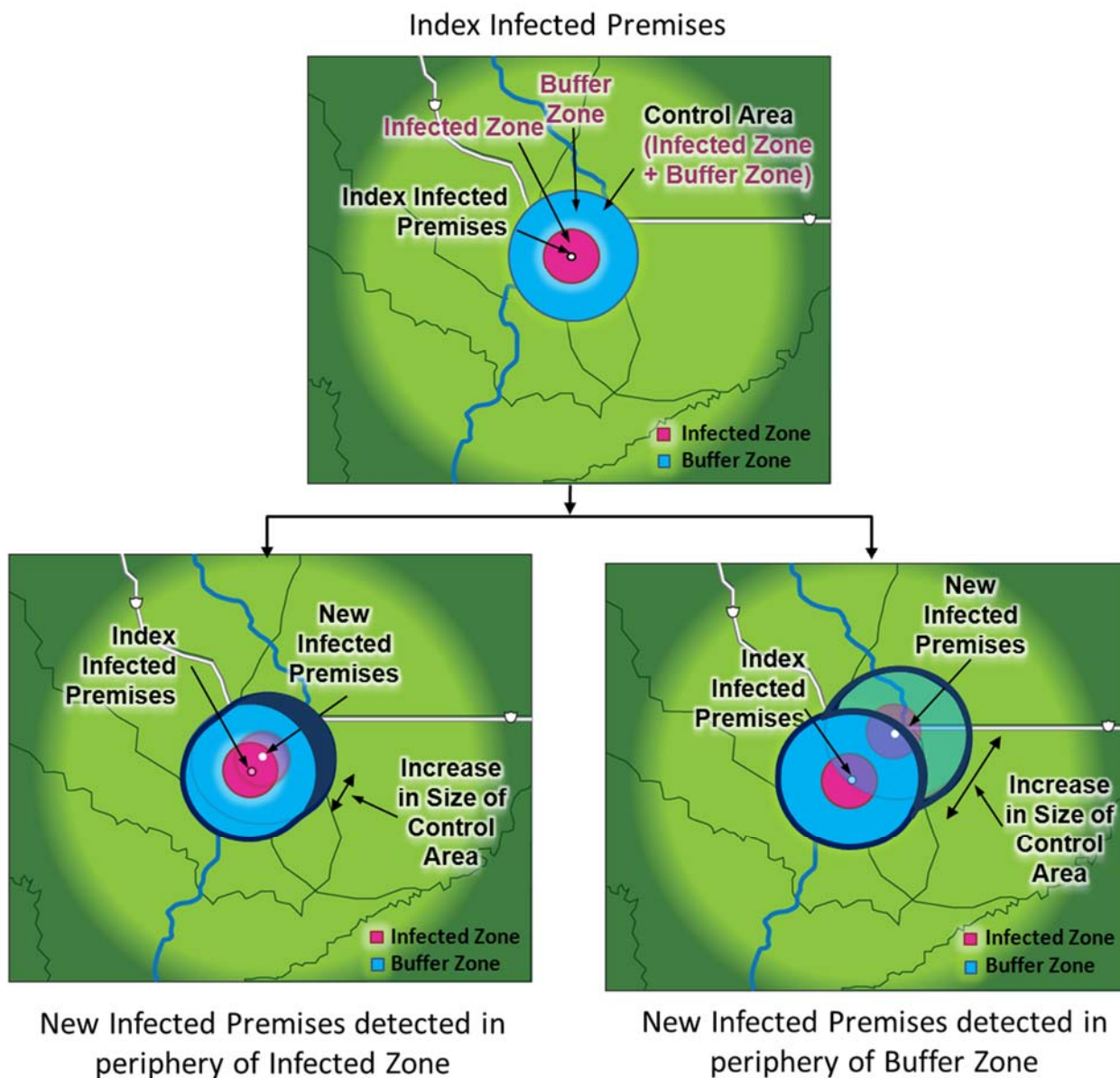
Assumptions for Example Surveillance Schemes

1. The 5-bird pool rRT-PCR test sensitivity is 86.5 percent.
2. Confidence Level: The probability of detecting at least one infected bird in the target population is 86.5 percent, which is limited by the sensitivity of the rRT-PCR test on the 5-bird pool.
3. HPAI infected birds die within 2–3 days post infection and rapidly infects the flock, thereby increasing the probability of quickly detecting IP.

-
4. In commercial premises, the producer detects, collects, and places all dead birds into the target population from which the 5-bird pool is drawn.
 5. The 20 infected HPAI bird threshold for each 50-dead-bird group is reached early in the disease spread in a house and is a logical feasible sample size.
 6. All HPAI infected birds are included in each house's daily dead bird target population.
 7. Outbreak response field personnel visiting backyard premises, with observation, will detect ill birds with HPAI compatible signs.
 8. The majority of backyard flocks have less than 100 birds; sampling frequently and sampling the daily dead birds maximizes the probability of detection, minimizes the trauma and disruption to the owner, and increases efficiency because less time will be spent capturing live birds.
 9. Sampling a 5-bird pool per 50 dead birds will sample a majority of daily dead birds in commercial broiler operations, commercial turkey premises and backyard premises because the dead bird number typically varies from 5.1 to 27 birds per day (see the Updated Background Information section below).
 10. Production parameters will be monitored for indications of HPAI intrusion.
 11. The consequences of an infected but undetected premises is greater if it is located at the periphery of the BZ vs. the periphery of the IZ:
 - a. Increased opportunity of disease spread due to less stringent movement requirements in the BZ.
 - b. Increased difficulty of surveillance:
 - i. A larger number of ARP that require sampling.
 - ii. A larger geographic area over which to sample ARP.
 - c. Increased size of the CA: An IP will increase the size of the CA by the radius of the IZ. However, if the newly detected IP is located on the periphery of the BZ, the size of the CA will increase by the radius of the IZ and the BZ.

Figure D-1 shows that the size of the CA depends on where the new IP is located.

Figure D-1. Infected Premises' Effect on Size of Control Area



Updated Background Information

- ◆ *House Size:* The number of birds per house varies from 7,000 in tom turkeys to 10,000 in hen turkeys, but a high of approximately 27,000 broilers per house. In layers, house sizes of 300,000 to 350,000 birds have become the norm.
- ◆ *Daily Mortality Rate:* Major factors influencing the daily mortality rate are: bird strain, bird age (early, mid, or late cycle), and house construction

design and age. Mortality over the following should be investigated, based on the case definition (the mortality triggers):

- Commercial broilers: mortality exceeding 3.5 birds/1,000 per day.
- Commercial layers: mortality exceeding 3 times the normal daily mortality per day (normal: 0.13 birds/1,000 per day for layers from 2 to 50 weeks, and 0.43 birds/1,000 per day for layers over 50 weeks); OR 5 percent drop in egg production for 3 consecutive days.
- Commercial turkeys: mortality exceeding 2 birds/1,000 per day.
- Broiler breeders: mortality exceeding 2 birds/1,000 per day.
- Layer breeders: mortality exceeding 3 times the normal daily mortality per day (normal: 0.2/1,000 per day prior up to 50 weeks, and 0.37 birds/1,000 per day after 50 weeks).
- Turkey breeders: mortality exceeding 2 birds/1,000 per day; OR a decrease in egg production of 15 percent occurring over a 2-day period.
- Small volume high-value commercial poultry and backyard flocks: any sudden and significant mortality event or sudden drop in egg production should be investigated.

References for this Appendix

Materials developed for the 2014–2015 HPAI outbreak in the United States (available at www.aphis.usda.gov/fadprep).

National Avian Influenza Surveillance Plan, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, June 29, 2007.

Cannon, R.M. 2001. Sense and Sensitivity-Designing Surveys Based on an Imperfect Test. *Prev Vet Med*, 49, 141–163.

Cannon, R.M. and Roe, R.T. 1982. Livestock Disease Surveys—A Field Manual for Veterinarians. Bureau of Rural Science, Department of Primary Industry. Australian Government Publishing Service, Canberra.

Flock, D.K., Laughlin, K.F., and Bentley, J. 2006. Minimizing losses to poultry breeding and production; how breeding companies contribute to poultry welfare. *Lohmann Information*. 41:20-28.

Personal communication between Drs. Alex Thompson (APHIS), Simon Shane (international poultry consultant), Gregg Cutler (private poultry veterinarian working in a three-person poultry practice in California), Ken Anderson (poultry veterinarian, North Carolina State University College of Agriculture and Life

Sciences, Extension Poultry Science), and Dave Halvorson (poultry veterinarian, University of Minnesota, School of Veterinary Medicine).

“The North Carolina Layer Performance and Management Test” (2009).

The “United Egg Producers” (www.uepcertified.com and www.unitedegg.org).

The Outbreak Surveillance Toolbox, available to people with access to the Inside APHIS webpage (<http://inside.aphis.usda.gov/vs/ceah/nsu/toolbox/>), or to those outside APHIS by e-mailing (FAD.PReP.Comments@aphis.usda.gov) provides additional surveillance resources.

Appendix E

Procedures for HPAI Investigations and Specimen Submission

Veterinary Services (VS) Guidance Document 12001 provides guidance for the investigation of potential foreign animal disease/emerging disease incidents. This document is available under “APHIS and VS Emergency Management Resources” at www.aphis.usda.gov/fadprep.

READY REFERENCE GUIDE: PROCEDURES AND POLICY FOR THE INVESTIGATION OF POTENTIAL FOREIGN ANIMAL DISEASE (FAD)/EMERGING DISEASE INCIDENTS (EDI) (VS GUIDANCE 12001.2)



FAD INVESTIGATION IS INITIATED

ADD and SAHO will:

- Assign an FADD.
- Ensure FAD Referral Control Number is assigned in EMRS.
- Assign FAD/EDI Case Coordinator(s).
- Ensure that initial case report is prepared and transmitted to the FADD.
- Consult with FADD, NVSL, and NAHLN lab to determine a diagnostic sample submission plan. Include ADD and SAHO for State of NAHLN lab, if different from the State of sample origin.
- Consult with FADD to ensure that an investigation classification and a diagnostic sample submission priority are assigned.
- If ADD, SAHO, and FADD designate Priority 1 or A, immediately call VS District and NPIC.

FADD will:

- Contact producer/owner/veterinary practitioner within 8 hours, and conduct a site visit within 24 hours. Situations involving interstate or international commerce must be investigated immediately.
- Contact NVSL Ames/NVSL FADDL and the NAHLN lab by phone prior to sample shipment/transport with the following:
 - Tracking number or transport identification,
 - Estimated time of arrival, and
 - Classification and priority.
- Ensure VS 10-4 Specimen Submission Form is completed for all diagnostic samples.
- Contact ADD, SAHO, and Tribal Officials with quarantine or hold order recommendations.
- Along with ADD, ensure that EMRS data entry and follow-up forms are completed.

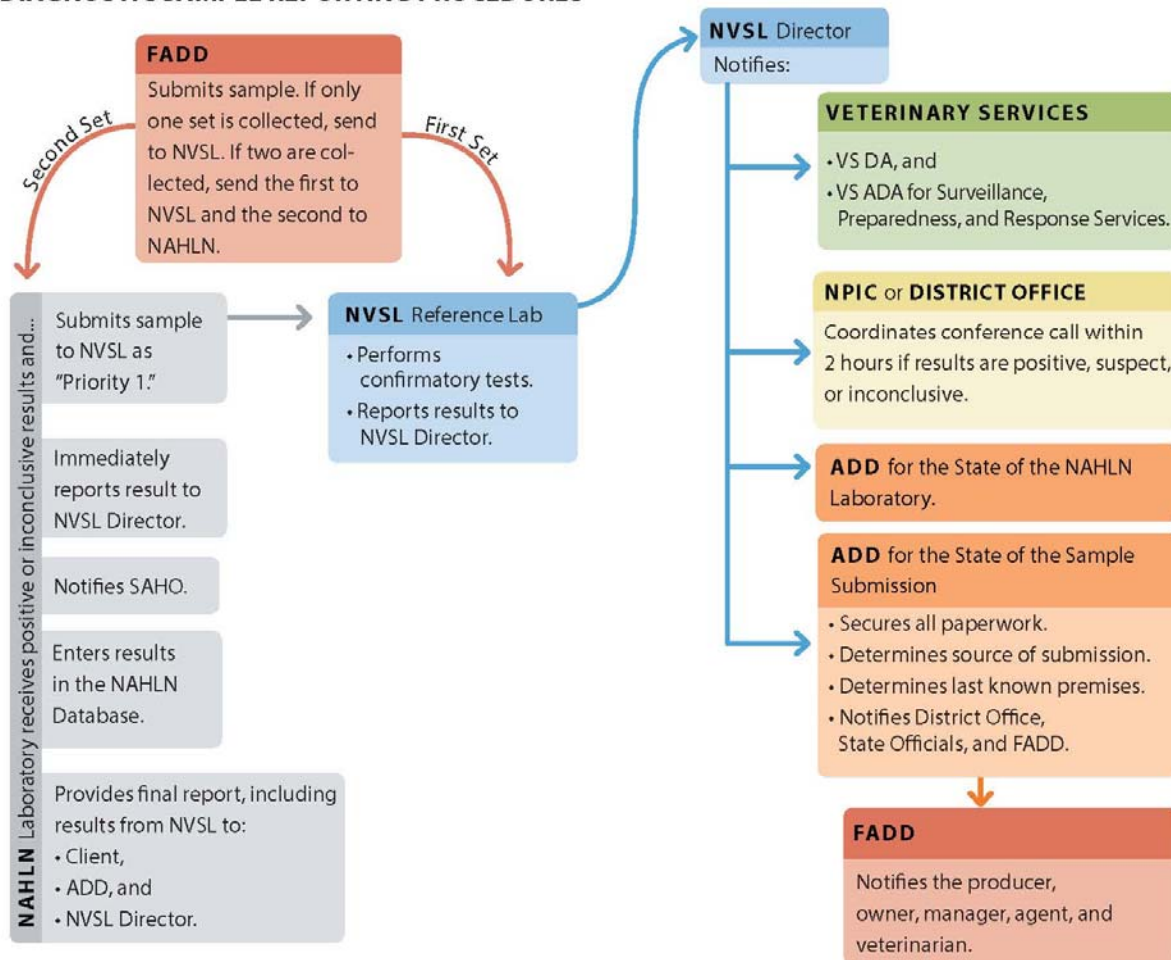
NPIC or DISTRICT OFFICE

Coordinates conference call within 2 hours if Priority 1 or A.

PRIORITY 1	PRIORITY 2	PRIORITY 3	PRIORITY A
<ul style="list-style-type: none"> • High Suspicion • NPIC or District Office coordinates conference call within 2 hours • Rapid or extraordinary methods for sample collection and transport • Testing conducted immediately upon arrival (overtime services as needed) 	<ul style="list-style-type: none"> • Intermediate Suspicion • Rapid methods for sample collection and transport • Testing conducted as necessary (overtime services as needed) • If sample arrives before close of business test immediately; after close of business test the following day; Saturday test on weekends only with prior notification and approval 	<ul style="list-style-type: none"> • Low Suspicion • Routine methods for sample collection and transport • Testing conducted in accession order (no overtime services) 	<ul style="list-style-type: none"> • Intermediate or Low Suspicion • NPIC or District Office coordinates conference call within 2 hours • Potential circumstances of investigation indicate need for rapid or extraordinary methods for sample collection and transport • Testing conducted immediately upon arrival (overtime as needed)

December 2014

DIAGNOSTIC SAMPLE REPORTING PROCEDURES



NVSL FADDL		NVSL AMES	
Main Office	(631) 323-3256	NVSL Director	(515) 337-7301
AFTER HOURS AND WEEKENDS		Diagnostic Virology	(515) 337-7551
Diagnostic Services Section Head	(631) 375-5314	Pathobiology	(515) 337-7526
Acting Diagnostic Services Section Head	(631) 332-6814	Diagnostic Bacteriology	(515) 337-7568
Courier	(631) 377-9877	AFTER HOURS AND WEEKENDS	
NPIC (M-F, 8:00 AM – 4:30 PM ET)		Nat'l Centers for Animal Health Dispatch	(515) 337-7200
Main Office	(301) 851-3595	APHIS VS DISTRICT OFFICES	
Jon Zack	(240) 252-8074	District One	(508) 363-2290
Darrel Styles	(240) 581-3958	District Two	(352) 313-3060
Nathan Birnbaum	(240) 508-9888	District Three	(517) 337-4700
AFTER HOURS AND WEEKENDS		District Four	(512) 383-2400
NPIC/NVS 24/7 Emergency Answering Service	(800) 940-6524	District Five	(970) 494-7400
		District Six	(916) 854-3950

December 2014

Appendix F

Epidemiological Investigation Questionnaire

This appendix contains two documents (1) a sample epidemiological questionnaire used in the 2014–2015 highly pathogenic avian influenza (HPAI) outbreak for turkey flocks and (2) the survey used in the epidemiological case control study for layer flocks.

The purpose of the epidemiological investigation is twofold: first, it works to assess pathways of initial introduction of the HPAI virus on to premises; second, the data collected helps to examine potential routes for lateral (infected premises to non-infected premises) transmission.

In any epidemiological investigation, it is important that the individual filling out the questionnaire or responding to the survey is highly knowledgeable about the premises management and operations. When possible, on-farm observation can help to augment the information provided by the manager or owner (e.g., watching required biosecurity procedures).

Based on the epidemiological situation or the types of premises involved in any HPAI outbreak, it may be appropriate to modify the questionnaire or add other questions regarding additional risk factors that may play a role in transmission.



Animal and
Plant Health
Inspection
Service

Veterinary
Services

HPAI Investigation - Questionnaire

INSTRUCTIONS

The purposes of these investigations are to assess potential pathways of initial introduction of HPAI viruses onto commercial poultry operations and potential lateral transmission routes of HPAI viruses from infected premises to noninfected premises.

Following confirmation of an HPAI virus introduction into a commercial flock, an investigation should be initiated as soon as possible, no later than 1 week following detection. The investigator(s) assigned should be integrated into other response activities but their primary focus is on completion of the introduction investigation.

The investigation form provided is a guide for conducting a systematic and standardized assessment of potential pathways of initial virus movement onto the farm and potential movement of the virus off the farm. All sections of the form should be completed through direct conversation with the individual(s) most familiar with the farm's management and operations and questions are to be answered for the period 2 weeks prior to the detection of HPAI. Where applicable, direct observation of the biosecurity or management practice asked about should be conducted. This is not a box-checking exercise but an in-depth review of the current biosecurity and management practices and exposure risks on an affected farm. For example, direct observation of the farm employee donning and doffing procedures and compliance with company biosecurity practices is more important than checking the box on the form that indicates workers wear coveralls into the poultry houses. Investigators are encouraged to take notes and include them with the investigation form when completed.

An investigation form should be completed for the infected house or farm and **at least one** noninfected house or farm within the same complex as near as possible to the index infected flock.

Date: _____

Interviewer name/organization: _____

Interviewee name/organization: _____

A. PREMISES INFORMATION

Farm name: _____

Farm address: _____

Farm (premises) ID: _____ County: _____

Township: _____ Range: _____ Section: _____

Is facility enrolled in NPIP?..... ☐₁ Yes ☐₃ No

B. PREMISES CONTACT INFORMATION

1. Contact name: _____

Phone: _____ Cell phone: _____ Email: _____

2. Contact name: _____

Phone: _____ Cell phone: _____ Email: _____

3. Contact name: _____

Phone: _____ Cell phone: _____ Email: _____

4. Flock Veterinarian: _____

Phone: _____ Cell phone: _____ Email: _____

C. PREMISES DESCRIPTION

1. Poultry type: ☐₁ Broiler ☐₂ Layer ☐₃ Turkey ☐₄ Other (specify: _____)
2. Production type: ☐₁ Meat ☐₂ Egg ☐₃ Breeding ☐₄ Other (specify: _____)
3. Age: ☐₁ Multiple age ☐₂ Single age
4. Sex: ☐₁ Hen ☐₂ Tom ☐₃ Both
5. Flock size: # birds
6. Facility type: *[Check all that apply]*
 - ☐ Brood
 - ☐ Grow
 - ☐ Other (specify: _____)
 - ☐ Both brooder & grower houses are present on the same premises
 - ☐ Breeder
 - ☐ Commercial
7. If brooder and grower houses are present on the same premises, are there multiple stages of management (brooding and growing), in the same house? ☐₁ Yes ☐₃ No
8. Farm capacity # birds
Number of barns # barns
Barn capacity # birds
9. What is the **primary** barn type/ventilation: *[Check one only.]*
 - ☐₁ Curtain sided
 - ☐₂ Environmental control
 - ☐₃ Side doors
 - ☐₄ Other (specify: _____)
10. Are cool cell pads used? ☐₁ Yes ☐₃ No
If Yes, what is the source of water for these pads? _____
11. Distance in yards of closest body of water near farm: yd

12. Water body type: [Check all that apply.]

- ☐ Pond
☐ Lake
☐ Stream
☐ River
☐ Other (specify: _____)

13. What other types of animals are present on the farm?

- | | |
|--|--|
| a. Beef cattle | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| b. Dairy cattle | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| c. Horses | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| d. Sheep | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| e. Goats | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| f. Pigs | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| g. Dogs | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| h. Cats | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| i. Poultry or domesticated waterfowl | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| j. Other (specify: _____) | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |

14. What is the **primary** water source for poultry? [Check one only.]

- ☐₁ Municipal
☐₂ Well
☐₃ Surface water (e.g., pond)
☐₄ Other (specify: _____)

15. Is water treated prior to delivery to poultry? ☐₁ Yes ☐₃ No

If Yes, how is it treated and with what? _____

D. FARM BIOSECURITY

1. Is there a house with a family living in it on the property? ☐₁ Yes ☐₃ No
2. Is there a common drive entrance to farm and residence? ☐₁ Yes ☐₃ No
3. Do you have signage of "no admittance" or "biosecure area" on this property? .. ☐₁ Yes ☐₃ No
4. Is there a gate to this farm entrance? ☐₁ Yes ☐₃ No
5. Is the gate secured/locked? ☐₁ Yes ☐₃ No
If Yes, what hours is it secured? _____
6. Is the farm area fenced in? ☐₁ Yes ☐₃ No
7. How frequently is vegetation mowed/bush hogged on the premises? _____ times/month
8. Is facility free of debris/clutter/trash piles? ☐₁ Yes ☐₃ No
9. Is there a wash station/spray area available for vehicles? ☐₁ Yes ☐₃ No
If Yes, what disinfectant is used? _____
10. Is there a designated parking area for workers and visitors
away from the barns/pens? ☐₁ Yes ☐₃ No
11. Is there a changing area for workers? ☐₁ Yes ☐₃ No
Do they shower? ☐₁ Yes ☐₃ No
12. Do workers don dedicated laundered coveralls before entering
each house on the premises? ☐₁ Yes ☐₃ No
13. Do worker wear rubber boots or boot covers in poultry houses? ☐₁ Yes ☐₃ No
14. Are the barn/pen doors lockable? ☐₁ Yes ☐₃ No
Are they routinely locked? ☐₁ Yes ☐₃ No
15. Are foot pans available at barn/pen entrances? ☐₁ Yes ☐₃ No
Are they in use? ☐₁ Yes ☐₃ No
16. Are foot baths dry (powdered or particulate disinfectant)? ☐₁ Yes ☐₃ No
17. Are foot baths liquid disinfectant? ☐₁ Yes ☐₃ No
18. Frequency foot pan solutions are changed? _____ times/month

What disinfectant is used? _____

19. Is there an entry area in the barns/pens before entering the bird area? ☐₁ Yes ☐₃ No

20. What pest and wildlife control measures are used on this farm?

a. Rat and mouse bait stations ☐₁ Yes ☐₃ No

b. Bait stations checked at least every 6 weeks ☐₁ Yes ☐₃ No

c. Fly control used..... ☐₁ Yes ☐₃ No

If Yes, type and frequency: _____

d. Houses are bird proof ☐₁ Yes ☐₃ No

e. Wild birds seen in house ☐₁ Yes ☐₃ No

If Yes, type, number and frequency: _____

f. Raccoons, possums, foxes seen in or around poultry houses ☐₁ Yes ☐₃ No

g. Wild turkeys, pheasants, quail seen around poultry ☐₁ Yes ☐₃ No

21. Are biosecurity audits or assessments (company or third party) conducted on this farm? ☐₁ Yes ☐₃ No

If Yes, when was the last audit or assessment conducted? _____

(Obtain a copy of the result of the audit or assessment if available.)

22. Has this farm been confirmed positive for HPAI? ☐₁ Yes ☐₃ No

E. FARM HELP/WORKERS

1. Total number of persons working on farm #

2. Number of workers living on the farm premises who are:

a. Family..... #

b. Nonfamily..... #

3. Workers are assigned to: *[Check one only.]*

☐₁ Entire farm

☐₂ Specific barns/areas

4. Do the workers have a common break area? ☐₁ Yes ☐₃ No

If Yes, location: _____

-
5. Are workers employed by other poultry operations?..... ☐₁ Yes ☐₃ No
6. How often are training sessions held on biosecurity for workers?..... _____ times/year
7. Are family members employed by other poultry operations or processing plants? ☐₁ Yes ☐₃ No
If Yes, poultry operation or processing plant: _____
8. Do part-time/weekend help and other extended family members
on holidays and vacations? ☐₁ Yes ☐₃ No
9. Are workers (full & part-time) restricted from being in contact
with backyard poultry?..... ☐₁ Yes ☐₃ No
How is this communicated? _____

F. FARM EQUIPMENT

Is the equipment used on this premises farm specific, under joint ownership that remains on this premises, or under joint ownership and used on other farm premises? A list of equipment follows.

1. Company vehicles/trailers:
Farm specific? ☐₁ Yes ☐₃ No
If No, by whom is equipment jointly used: _____
Dates: _____
2. Feed trucks (excess feed):
Farm specific? ☐₁ Yes ☐₃ No
If No, by whom is equipment jointly used: _____
Dates: _____
3. Gates/panels:
Farm specific? ☐₁ Yes ☐₃ No
If No, by whom is equipment jointly used: _____
Dates: _____
4. Lawn mowers:
Farm specific? ☐₁ Yes ☐₃ No
If No, by whom is equipment jointly used: _____
Dates: _____

5. Live haul loaders:

Farm specific? ☐₁ Yes ☐₃ No

If No, by whom is equipment jointly used: _____

Dates: _____

6. Poult trailers: Farm specific?

Farm specific? ☐₁ Yes ☐₃ No

If No, by whom is equipment jointly used: _____

Dates: _____

7. Pre-loaders:

Farm specific? ☐₁ Yes ☐₃ No

If No, by whom is equipment jointly used: _____

Dates: _____

Describe pre-loader cleaning and disinfection procedures:

8. Pressure sprayers/washers:

Farm specific? ☐₁ Yes ☐₃ No

If No, by whom is equipment jointly used: _____

Dates: _____

9. Skid-steer loaders:

Farm specific? ☐₁ Yes ☐₃ No

If No, by whom is equipment jointly used: _____

Dates: _____

10. Tillers:

Farm specific? ☐₁ Yes ☐₃ No

If No, by whom is equipment jointly used: _____

Dates: _____

11. Trucks:

Farm specific? ☐₁ Yes ☐₃ No

If No, by whom is equipment jointly used: _____

Dates: _____

12. Other equipment: _____

Farm specific? ☐₁ Yes ☐₃ No

If No, by whom is equipment jointly used: _____

Dates: _____

G. LITTER HANDLING

1. Litter type: _____

2. Supplier/source: _____

3. Is a litter shed present? ☐₁ Yes ☐₃ No

4. Do you do partial cleanouts? ☐₁ Yes ☐₃ No

If Yes, give dates of last partial cleanout: _____

5. Date of last cleanout: _____ date

Frequency of cleanout: _____ times/month

6. Who does the cleanout?

☐₁ Grower

☐₂ Contractor

If contractor, name and location _____

7. Litter is disposed of:

☐₁ On farm

☐₂ Taken off site

If taken offsite, name and location: _____

H. DEAD BIRD DISPOSAL

1. Approximate normal daily mortality # birds
2. How is daily mortality handled?
 - a. On-farm: Burial pit/incinerator/composted/other (specify: _____)
 - b. Off-farm: Landfill/rendering/other (specify: _____)
 - c. Off-farm disposal performed by: Owner/employee/other (specify: _____)
 - d. If burial or compost pits are used, are carcasses covered with soil on a daily basis? ☐ Yes ☐ No
3. Contact name of company or individual responsible for disposal: _____
 If rendering is used, include location of carcass bin on the farm map.
4. What is the pickup schedule? _____
5. Does the carcass bin have a cover? ☐ Yes ☐ No
 Is it routinely kept closed? ☐ Yes ☐ No

I. FARM VISITORS

1. How many visitors do you have on a daily basis? #
2. Is there a visitor log to sign in? ☐ Yes ☐ No
 Is it current? ☐ Yes ☐ No
3. Do you provide any outer clothing to visitors entering the farm? ☐ Yes ☐ No
 If Yes, identify items of clothing provided: _____
4. Mark the following services that were on the farm when this flock was on the farm.
 List date of service and name of person (or contract company) and if they had contact with the birds.

Service		Dates	Name	Contact?
Service person	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Vaccination crew	<input type="checkbox"/> Yes <input type="checkbox"/> No	_____	_____	<input type="checkbox"/> Yes <input type="checkbox"/> No
Moving crew (moving from brood to grow, or pullet house to layer house)				

☐ Yes ☐ No _____ ☐ Yes ☐ No

Processing plant load out

☐ Yes ☐ No _____ ☐ Yes ☐ No

Load-out crew (positive flock) ☐ Yes ☐ No ☐ Yes ☐ No

If load-out took more than one night, was returning crew the same crew? ☐ Yes ☐ No

Truck #/ #'s _____

Trailer #/ #'s _____

What plant did flock go to? _____

Load-out crew (flock previous to positive flock)

☐ Yes ☐ No _____ ☐ Yes ☐ No

If load-out took more than one night, was returning crew the same crew? ☐ Yes ☐ No

Truck #/ #'s _____

Trailer #/ #'s _____

What plant did flock go to? _____

Poult delivery ☐ Yes ☐ No _____ ☐ Yes ☐ No

Rendering pickup ☐ Yes ☐ No _____ ☐ Yes ☐ No

Litter services ☐ Yes ☐ No _____ ☐ Yes ☐ No

Cleanout services ☐ Yes ☐ No _____ ☐ Yes ☐ No

Equipment shared/rented/loaned/borrowed (each of the categories of visitor is likely to be accompanied by equipment of some sort or another)

☐ Yes ☐ No _____ ☐ Yes ☐ No

Feed delivery ☐ Yes ☐ No _____ ☐ Yes ☐ No

5. Who makes sure covers are closed after delivery? _____

6. Are feed covers kept closed? ☐ Yes ☐ No

J. WILD BIRDS

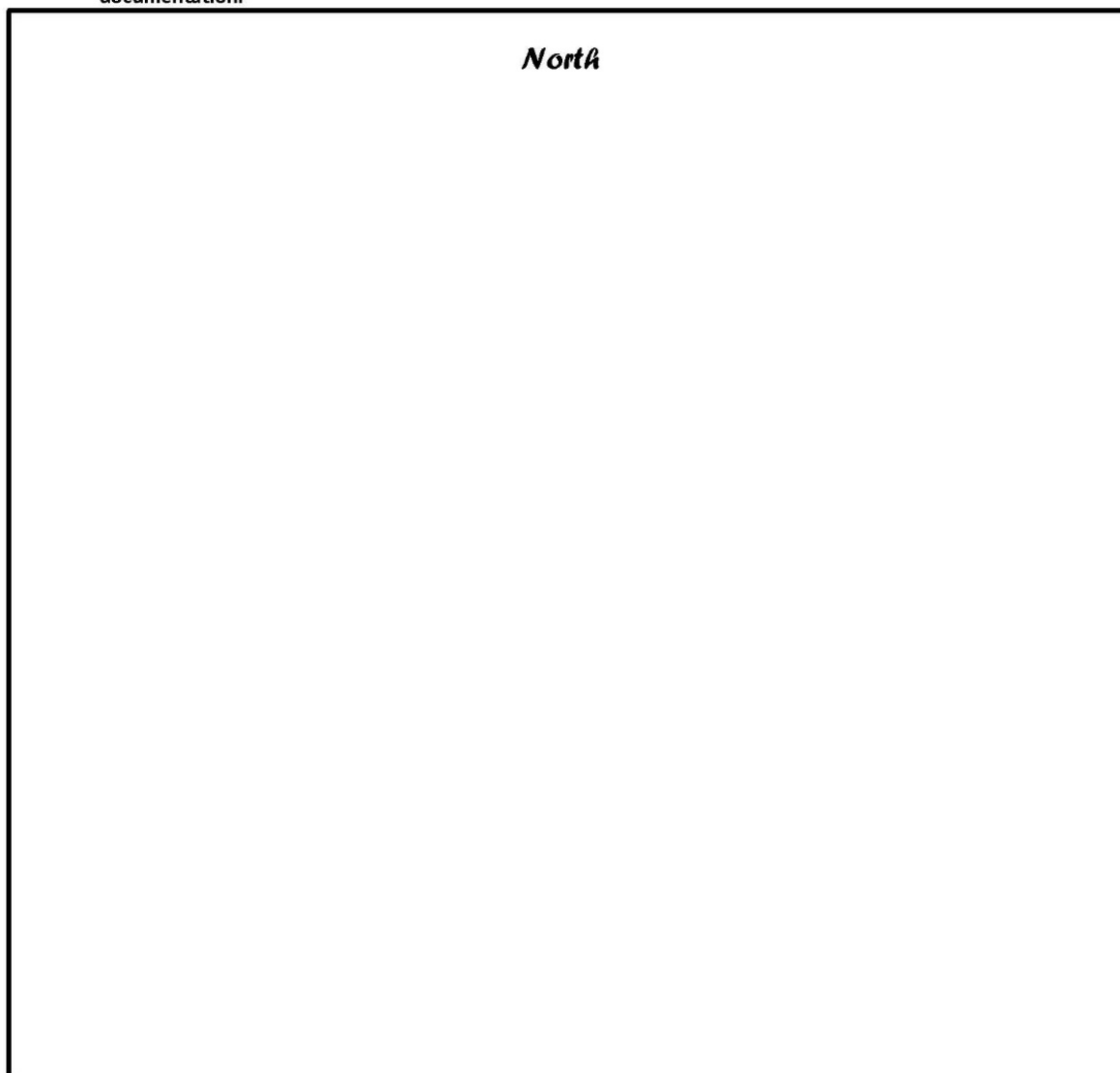
1. Do you see wild birds around your farm? ☐₁ Yes ☐₃ No
If Yes, what type of birds? [Check all that apply.]
☐ Waterfowl
☐ Gulls
☐ Small perching birds (sparrows, starlings, swallows)
☐ Other water birds (egrets, cormorants)
☐ Other _____
2. Do you see birds all year round? ☐₁ Yes ☐₃ No
If Yes, what type of birds? _____
3. Is there seasonality to the presence of some types of birds? ☐₁ Yes ☐₃ No
If Yes, what type of birds and what seasons do you see them? _____

4. Where are wild birds seen in relation to the farm?
☐₁ On adjacent habitats away from facilities and equipment (identify location of habitat on photos)
☐₂ On the farm but not in the barns (identify facilities or equipment birds have contact with)
☐₃ On the farm and sometimes in the barns (identify facilities or equipment birds have contact with)

K. NARRATIVE/COMMENTS

A large, empty rectangular box with a black border, intended for narrative or comments. It occupies the majority of the page area below the section header.

FARM DIAGRAM -Attach a download from satellite imagery if possible. In addition, draw a simple schematic map of the farm site centering with the poultry houses/pens. Identify where the HPAI positive flocks were housed. Also include: fan banks on houses, residence, driveways, public roads, bodies of water, feed tanks, gas tanks, out buildings, waster dumpsters, electric meters, dead bird disposal, parking areas, other poultry sites. Digital photographs, if allowed, are excellent supporting documentation.





Animal and Plant
Health Inspection
Service

Veterinary Services

National Animal Health
Monitoring System

2150 Centre Ave., Bldg B
Fort Collins, CO 80526

Form Approved
OMB Number 0579-0376
Approval Expires: 9/30/2017

Study ID: _____ frmid

Farm (premises) ID: _____

Date: _____ mm/dd/yy

A. PREMISES INFORMATION

Farm name: _____ frname

Farm address: _____ frmadd

County: _____ frmcty

Township: _____ frmtshp Range: _____ frmrng Section: _____ frmsec

1. Supervisor Contact name: _____ h201

Phone: _____ h202 Cell phone: _____ h203 Email: _____ h204

2. Farm manager Contact name: _____ h205

Phone: _____ h206 Cell phone: _____ h207 Email: _____ h208

3. Flock Veterinarian: _____ h213

Phone: _____ h214 Cell phone: _____ h215 Email: _____ h216

B. INTERVIEWER INFORMATION

Interviewer name/organization: _____ intrname

Interviewee name/organization: _____ intenname

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Animal and Plant
Health Inspection
Service

Veterinary Services

HPAI Case-Control Questionnaire

National Animal Health
Monitoring System

2150 Centre Ave., Bldg B
Fort Collins, CO 80526

Form Approved
OMB Number 0579-0376
Approval Expires: 9/30/2017

Study ID: _____ frmid

Date: _____ mm/dd/yy

INSTRUCTIONS

The Iowa Poultry Association, Iowa State University, and the United States Department of Agriculture APHIS (USDA APHIS) are conducting a case-control study as part of the highly pathogenic avian influenza (HPAI) investigation efforts to identify factors that may contribute to transmission of H5N2 influenza virus to poultry.

We are asking you to fill out this survey, which includes questions about things done daily on the farm, facility and premises condition, deliveries to the farm, and ill birds. We will be asking you questions about a 2 week (14 day) period on the farm starting on a particular date that we will provide. It might be difficult to remember back that far, so please use a pocket calendar or other agenda manager, and any feed and other delivery records that might be available to you.

Term	Case Definition	Control Definition
Premises	Farm location with flocks confirmed to be HPAI H5N2 infected by NVSL, including all barns and buildings; even if not all barns and buildings contain infected birds.	Farm location with no infected birds in any barn or building, in close proximity (less than 10 miles) of the case farm.
Barn	Barn or building that houses HPAI H5N2 infected birds.	On case premise, a barn or building that does not house any infected birds.

Dates of Study Focus:

Case farms answer questions for the timeframe of 14 days prior to the onset of clinical signs or increased mortality. All questions that ask about the past 14 days are referring to this time period.

Control farms answer questions for the timeframe of 14 days prior to date of first detection on the matched case farm. All questions that ask about the past 14 days are referring to this time period.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0579-0376. The time required to complete this information collection is estimated to average 1 hour per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collected.

NAHMS-349
SEP 2017

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A. CASE OR CONTROL

1. Is this a case or control farm? e100

☐₁ Case – **Go to Question 2.**
☐₃ Control – **Go to Question 3.**

2. If this is a **case** farm,
 - a. When were clinical signs or increased mortality first observed? e101 ____ mm/dd/yy
 - b. 14 days prior to the date of first detection (clarifying timeframe of study focus)..... e102 ____ mm/dd/yy

All questions regarding the past 14 days are referring to the 14 days prior to this reference date (i.e., the time between “a” and “b”).

 - c. When was the flock diagnosed as positive?.....e103 ____ mm/dd/yy
 - d. As of today, how many of the barns on this farm have been confirmed or are suspected to be infected with HPAI?.....e104 ____ # barns
 - e. On the reference date, was this farm in an existing control zone?.....e105 ☐₁ Yes ☐₃ No

Go to Question 4.

3. If this is a **control** farm,
 - a. Enter reference date here (enter date of matched case farm prior to interview).....e106 ____ mm/dd/yy
 - b. Enter the date 14 days prior to the reference date.....e107 ____ mm/dd/yy

All questions regarding the past 14 days are referring to the 14 days prior to this reference date (i.e., the time between “a” and “b”).

 - c. Is this farm located in a control zone?..... e108 ☐₁ Yes ☐₃ No
 - i. If “Yes,” how long has it been in a control zone? e109d/e109w ____ days
 - OR
 - ____ weeks
 - d. What is the distance (in miles) from this farm to the nearest case farm?.....e110 ____ miles

4. How many birds were on this farm on this reference date?h313 ____ # birds

B. PREMISES DESCRIPTION

1. Is this a: *[Check one only.]* e201
- ☐₁ Company farm?
- ☐₂ Contract farm?
- ☐₃ Lease farm?
- ☐₄ Independent farm?
2. What type(s) of poultry are present on this farm?
- a. Turkey e202 ☐₁ Yes ☐₃ No
- b. Broiler e203 ☐₁ Yes ☐₃ No
- c. Layer e204 ☐₁ Yes ☐₃ No
- d. Other (specify: _____) e205/e205oth ☐₁ Yes ☐₃ No
3. What poultry production type(s) are present on this farm?
- a. Meat e206 ☐₁ Yes ☐₃ No
- b. Egg e207 ☐₁ Yes ☐₃ No
- c. Breeding e208 ☐₁ Yes ☐₃ No
- d. Other (specify: _____) e209/e209 oth ☐₁ Yes ☐₃ No
4. Is this farm certified organic? e210 ☐₁ Yes ☐₃ No
5. Is this facility enrolled in NPIP? npip ☐₁ Yes ☐₃ No
6. Is this farm multiple age or single age? h303
- ☐₁ Multiple age
- ☐₂ Single age
7. What stage(s) of production is on this farm?
- a. Pullets e211 ☐₁ Yes ☐₃ No
- b. Layers e212 ☐₁ Yes ☐₃ No
- c. Breeders e213 ☐₁ Yes ☐₃ No
- d. Other (specify: _____) e214 ☐₁ Yes ☐₃ No
8. How many barns are on this farm? h314 _____ # barns

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9. Do any birds on the farm have access to the outdoors? e215 ☐₁ Yes ☐₃ No
10. How many barns are:
- | | |
|---|------------------|
| a. Conventional cage housing?.....e216 | _____ # |
| b. Enriched caged housing?e217 | + _____ # |
| c. Cage free (certified organic)?e218 | + _____ # |
| d. Cage free (not certified organic)?.....e219 | + _____ # |
| Total (must equal Question 8 response) e219a | = _____ # |
11. Are any poultry on this farm pastured?.....e220 ☐₁ Yes ☐₃ No
12. What is the distance (in yards) of the closest body of water (e.g., pond, lake, stream, river, wetland) to this farm? h319 _____ yards
- a. Specify this water body type: _____ h319spe
13. Approximately how many wild waterfowl might have been seen on this body of water at one time? Try to answer the question for the past 14 days. e221
- ☐₁ None – *Skip to Question 15.*
- ☐₂ Tens
- ☐₃ Hundreds
- ☐₄ Thousands
14. What type(s) of waterfowl were seen on the water in the 14 days?
- | | |
|--|---|
| a. Ducks.....e222 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No <input type="checkbox"/> ₄ Don't Know |
| b. Geese.....e223 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No <input type="checkbox"/> ₄ Don't Know |
| c. Shorebirds (e.g., wading birds, gulls).....e224 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No <input type="checkbox"/> ₄ Don't Know |
| d. Other (specify: _____)e225/e225oth | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No <input type="checkbox"/> ₄ Don't Know |
15. Are the following water body type(s) visible or within 350 yards (about 3 football fields) of this farm?
- | | |
|--|--|
| a. Pond e226 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| b. Lake e227 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| c. Stream e228 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| d. River e229 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| e. Wetland or swamp e230 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| f. Wastewater lagoon e231 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| g. Other (specify: _____) e234/e234oth | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
16. What is the distance (in yards) to the closest field where crops are harvested?..... e235 _____ yards

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17. What crop was last grown in this field?e236
- ☐₁ Corn
- ☐₂ Soybeans
- ☐₃ Alfalfa or grass intended for livestock feed
- ☐₄ Other (specify: _____)e236oth
18. Was this field tilled last fall?.....e237 ☐₁ Yes ☐₃ No ☐₄ Don't Know
19. Was this field actively worked (e.g., tilled or disced)
in the past 14 days?.....e238 ☐₁ Yes ☐₃ No ☐₄ Don't Know
20. What was the approximate concentration of wild waterfowl observed at a
single view in this field in the past 14 days?e239
- ☐₁ None – **Skip to Question 22**
- ☐₂ Tens
- ☐₃ Hundreds
- ☐₄ Thousands
21. What type(s) of waterfowl were observed?
- a. Duckse240 ☐₁ Yes ☐₃ No ☐₄ Don't Know
- b. Geesee241 ☐₁ Yes ☐₃ No ☐₄ Don't Know
- c. Shorebirdse242 ☐₁ Yes ☐₃ No ☐₄ Don't Know
- d. Other (specify: _____)e243/e243oth ☐₁ Yes ☐₃ No ☐₄ Don't Know
22. What other types of animals are present on the farm premises?
- a. Beef cattleh325 ☐₁ Yes ☐₃ No
- b. Dairy cattleh326 ☐₁ Yes ☐₃ No
- c. Horsesh327 ☐₁ Yes ☐₃ No
- d. Sheeph328 ☐₁ Yes ☐₃ No
- e. Goatsh329 ☐₁ Yes ☐₃ No
- f. Pigsh330 ☐₁ Yes ☐₃ No
- g. Dogsh331 ☐₁ Yes ☐₃ No
- h. Catsh332 ☐₁ Yes ☐₃ No
- i. Poultry or domesticated waterfowlh333 ☐₁ Yes ☐₃ No

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j. Other (specify: _____)h334/h334oth ☐₁ Yes ☐₃ No

23. What is the water source for poultry?

- a. Municipale244 ☐₁ Yes ☐₃ No
- b. Welle245 ☐₁ Yes ☐₃ No
- c. Surface water (e.g., pond)e246 ☐₁ Yes ☐₃ No
- d. Other (specify: _____)....e247/247oth ☐₁ Yes ☐₃ No

24. Are the following water treatments used in the drinking water for the poultry on this farm?

- a. Chlorination e248 ☐₁ Yes ☐₃ No
- b. Acidifiers e249 ☐₁ Yes ☐₃ No
- c. Iodine e250 ☐₁ Yes ☐₃ No
- d. Peroxide e251 ☐₁ Yes ☐₃ No
- e. Other (specify: _____)..... e252/e252oth ☐₁ Yes ☐₃ No

25. Are windbreaks present on this farm? If "Yes," what is the distance (in yards) from the windbreak to the closest poultry barn?

Windbreak type	Present?	If "Yes," distance to closest poultry barn	
a. Evergreen or juniper windbreak	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ yards	e253/e256
b. Deciduous tree windbreak	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ yards	e254/e257
c. Structural (e.g., hill, natural break)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ yards	e255/e258

26. Excluding driveways on farm, what is the distance (in yards or miles)

from this farm to the nearest public gravel or dirt road?.....e259y/e259m _____yards OR _____ miles

C. FARM BIOSECURITY

1. Is there a house with people living in it on the property? h401 ☐₁ Yes ☐₃ No – *Skip to Question 3*
2. Is there a common drive entrance to farm and residence?.....h402 ☐₁ Yes ☐₃ No
3. How many entrances are there to the farm that could provide access to the poultry area?.....e301 _____ #

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4. Which best describes the road surface on this farm that vehicles coming onto the operation drive on? *[Check one only.]*

e302

☐₁ Hard top/asphalt

☐₂ Gravel

☐₃ Dirt

☐₄ Other (specify: _____) e302oth

5. In general, do the following types of vehicles:

Codes for Question 5
1 = come to the perimeter of the farm only
2 = enter the farm but not near the barns
3 = come near the barns
4 = do not come at all

Enter the codes that apply

- a. Garbage/dumpster pick-up? e303 _____ code
- b. Propane delivery? e304 _____ code
- c. Feed delivery? e305 _____ code
- d. Renderer? e306 _____ code
- e. Company personnel (e.g., processing plant and barn workers, service person, veterinarian)? e307 _____ code
- f. Egg trucks moving eggs *off* the farm (e.g., to processing, for breaking, to the consumer market)? e308 _____ code
- g. Egg trucks moving eggs *to* the farm (i.e., sideloading)? e309 _____ code
- h. Other business visitors (e.g., meter reader, repairman)? e310 _____ code
6. Is there a gate to this farm entrance? h404 ☐₁ Yes ☐₃ No – *Skip to Question 8*
7. Is the gate secured/locked? h405 ☐₁ Always ☐₂ After hours only ☐₃ Never
8. Is the farm area perimeter surrounded by a security fence? h407 ☐₁ Yes ☐₃ No
9. How frequently is vegetation mowed/bush hogged on the premises (answer for when vegetation is present, e.g., spring and summer) h408 _____ times/month
10. Is the facility free of debris/clutter/trash piles? h409 ☐₁ Yes ☐₃ No
11. Is there a wash station/spray area being used for vehicles? h410 ☐₁ Yes ☐₃ No – *Skip to Question 13*

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12. If "Yes:"

- a. Is it located on the farm? e311 ☐₁ Yes ☐₃ No
- b. Are the tires washed? e312 ☐₁ Yes ☐₃ No
- c. Is the vehicle exterior washed? e313 ☐₁ Yes ☐₃ No
- d. Is the vehicle interior cleaned (e.g., floor mats) e314 ☐₁ Yes ☐₃ No
- e. Which vehicles are washed:
- i. Worker vehicles? e315 ☐₁ Yes ☐₃ No
- ii. Feed trucks? e316 ☐₁ Yes ☐₃ No
- iii. Egg trucks? e317 ☐₁ Yes ☐₃ No
- iv. Other (specify: _____)? e318/e318oth ☐₁ Yes ☐₃ No
- f. What disinfectant is used? h411
- g. Was the wash station: [Check one only.] e319
- ☐₁ Recently put into use as a response to heightened biosecurity concerns?
- ☐₁ A permanent station (i.e., in use prior to the HPAI incident)?

13. Do workers and visitors always, sometimes or never park in a restricted area away from the poultry barns?

- a. Workers..... e320 ☐₁ Always ☐₂ Sometimes ☐₃ Never
- b. Visitors e321 ☐₁ Always ☐₂ Sometimes ☐₃ Never

14. What pest and wildlife control measures were used on this farm in the past 14 days?

- a. Rat and mouse bait stations? h426 ☐₁ Yes ☐₃ No
- If "Yes," how frequently are they checked? e322 _____ times/month
- b. Beetle control? e323 ☐₁ Yes ☐₃ No
- If "Yes," type:
- i. Sprays e324 ☐₁ Yes ☐₃ No
- ii. Boric acid e325 ☐₁ Yes ☐₃ No
- iii. Baits e326 ☐₁ Yes ☐₃ No
- iv. Other (specify: _____) e327/e327oth ☐₁ Yes ☐₃ No

- c. Fly control (other than manure removal)? h428 ☐₁ Yes ☐₃ No
- If "Yes," type:
- i. Residual spray e328 ☐₁ Yes ☐₃ No
 - ii. Baits e329 ☐₁ Yes ☐₃ No
 - iii. Larvacide (spot treatment) e330 ☐₁ Yes ☐₃ No
 - iv. Larvacide in feed e331 ☐₁ Yes ☐₃ No
 - v. Space sprays/fogger e332 ☐₁ Yes ☐₃ No
 - vi. Biological predators e333 ☐₁ Yes ☐₃ No
 - vii. Other (specify: _____). e334/e334oth ☐₁ Yes ☐₃ No
15. Overall, how severe of a problem were rodents during the past 14 days? e335
- [Check one only.]
- ☐₁ High (e.g., significant damage to building, significant impact on layer health or feed efficiency)
 - ☐₂ Moderate (e.g., moderate damage to building, moderate impact on layer health or feed efficiency)
 - ☐₃ Low (e.g., minor impact on building or feed efficiency)
 - ☐₄ No problem
16. Do you monitor rodent index as part of your rodent control program?.....e336 ☐₁ Yes ☐₃ No – *Skip to Question 18*
- Note:** Rodent index (RI) is the equivalent of number of mice caught in 7 days with 12 traps using the formula:

$$RI = (\text{number of mice caught}) \times (7 / \text{days trapped}) \times (12 / \text{number of traps})$$
17. Which of the following ranges best describes your rodent index in the past 14 days? [Check one only.] e337
- ☐₁ Low (0 to 10 mice)
 - ☐₂ Moderate (11 to 25 mice)
 - ☐₃ High (26 or more mice)
18. Were wild mammals such as raccoons, opossums, coyotes, or foxes (or evidence of their presence), seen in or around poultry houses in the past 14 days?..... e338 ☐₁ Yes ☐₃ No

19. Prior to feeding, how frequently do wild birds, wild animals, and rodents have access to poultry feed (i.e., feed spillage, open bag, cover left open)?

	Always/ Nearly always	Most of the time	Sometimes	Never	
a. Wild birds	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e339
b. Wild animals such as raccoons, opossums, coyotes or foxes	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e340
c. Rodents	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e341

20. Describe the protocol or plan for when feed spills on your farm? e342 _____

21. What form of feed is fed to the poultry?

- a. Mash e343 ☐₁ Yes ☐₃ No
- b. Pellets e344 ☐₁ Yes ☐₃ No
- c. Other (specify: _____) e345/e345oth ☐₁ Yes ☐₃ No

22. Is the feed treated with:

- a. Formaldehyde (i.e., Termin-8)? e346 ☐₁ Yes ☐₃ No
- b. Antimicrobial (e.g., ionophores)? e347 ☐₁ Yes ☐₃ No
- c. Other (specify: _____) e348/348oth ☐₁ Yes ☐₃ No

23. Is the feed heat treated? e349 ☐₁ Yes ☐₃ No

D. WILD BIRDS

1. How frequently have the following types of wild birds been seen on habitats adjacent to the farm (but not on the farm) in the past 14 days?

Bird type	Daily	Less than daily	Never	
a. Waterfowl (e.g., ducks, geese)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e401
b. Gulls	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e402
c. Small perching birds (e.g., sparrows, starlings, swallows)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e403
d. Blackbirds and crows	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e404
e. Other water birds (e.g., egrets, cormorants)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e405
f. Wild turkeys, pheasants, quail	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e406
g. Raptors (e.g., eagles, hawks, owls)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e407
h. Pigeons and doves	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e408
i. Other (specify: _____)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e409/e409oth

- a. Do wild waterfowl use this area at other times of the year? e410 ☐₁ Yes ☐₃ No

2. How frequently have the following types of wild birds been seen on the farm, but outside of the barns (within 100 yards) in the past 14 days?

Bird type	Daily	Less than daily	Never	
a. Waterfowl (e.g., ducks, geese)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e411
b. Gulls	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e412
c. Small perching birds (e.g., sparrows, starlings, swallows)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e413
d. Blackbirds and crows	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e414
e. Other water birds (e.g., egrets, cormorants)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e415
f. Wild turkeys, pheasants, quail	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e416
g. Raptors (e.g., eagles, hawks, owls)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e417
h. Pigeons and doves	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e418
i. Other (specify: _____)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e419/e419oth

3. How frequently have the following types of wild birds been seen in the barns in the past 14 days?

Bird type	Daily	Less than daily	Never	
a. Large birds (e.g., pigeons, crows)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e420
b. Small birds (e.g., finches, sparrows, starlings)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e421
c. Other (specify: _____)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e422/e422oth

4. Have you observed any of the following types of **dead** wild birds *in* the barns or *outside* of the barns in the past 14 days?

Dead bird type	Inside the barns?	Outside the barns?	
a. Large birds (e.g., pigeons, crows)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e423
b. Small birds (e.g., finches, sparrows, starlings)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e424
c. Other (specify: _____)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e425/e425oth

E. FARM HELP/WORKERS

Questions in this section refer to persons such as the producer, employees, farm help, crews, etc.

1. What is the total number of employees working on this farm that have access to or directly work with poultry (including family, both paid and unpaid)? e501 _____ #

2. Are the following measures always/nearly always, sometimes, or never required for workers entering the poultry houses?

Measure	Always/ Nearly always	Most of the time	Sometimes	Never	
a. An established clean/dirty line	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e502
b. Shower	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e503
c. Wash hands before entering and/or before leaving the barn	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e504
d. Different personnel for different houses	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e505
e. Wear disposable coveralls	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e506
f. Change of clothing (washable)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e507
g. Change of shoes or use of shoe covers	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e508
h. Foot bath (liquid)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e509
i. Foot bath (dry)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e510
j. Scrub footwear (bucket and brush)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	<input type="checkbox"/> ₄	e511

3. Do workers on this farm work on other company farms?.....e512 ☐₁ Yes ☐₃ No

4. Are workers or members of their household employed by other poultry operations, rendering plants, or processing plants?e513 ☐₁ Yes ☐₃ No

If "Yes," list the poultry operation(s), rendering plant(s), or processing plant(s): e514 _____

5. Do any employees own their own poultry, including small backyard flocks?.....e515 ☐₁ Yes ☐₃ No ☐₄ Don't Know

6. Are employees required to stay off farm after exposure to other poultry?.....e516 ☐₁ Yes ☐₃ No
If "Yes," for how long (hours)?.....e517 _____ hours

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F. FARM VISITORS

1. Did any of the following types of people visit the farm in the past 14 days? If "Yes," how many times did they visit and did they enter the poultry barn?

Visitor type	Did they visit the farm?	If "Yes,"		
		How many times did they visit?	Did this visitor enter the poultry barn?	
a. Federal/state veterinary or animal health worker	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e601/e619/e637
b. Extension agent or university veterinarian	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e602/e620/e638
c. Private or company veterinarian	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e603/e621/e639
d. Company service person	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e604/e622/e640
e. Nutritionist or feed company consultant	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e605/e623/e641
f. Pullet delivery	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e606/e624/e642
g. Vaccination crew	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e607/e625/e643
h. Catch crew	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e608/e626/e644
i. Feed delivery personnel	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e609/e627/e645
j. Egg truck personnel	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e610/e628/e646
k. Litter services (delivery, pick-up)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e611/e629/e647
l. Customer (private individual)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e612/e630/e648
m. Wholesaler, buyer, or dealer	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e613/e631/e649
n. Renderer	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e614/e632/e650
o. Occasional worker (e.g., family member, part time help over holiday)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e615/e633/e651
p. Construction workers	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e616/e634/e652
q. Other business visitors (including other producers, meter readers, package delivery (UPS), repair person, wildlife services, and service personnel)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e617/e635/e653
r. Other nonbusiness visitors (including neighbors, friends, and school field trips)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	_____ # visits	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e618/e636/e654

2. Is a visitor log used to record visitor traffic onto the farm?..... e655 ☐₁ Yes ☐₃ No

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3. For those visitors who entered the poultry barn in the past 14 days, did you always/nearly always, sometimes or never require the following?

	Always/ Nearly always	Sometimes	Never	
a. Change of outer clothing/farm specific clothing	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e656
b. Foot covers or change of footwear	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e657
c. Mask	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e658
d. Hand sanitizing or gloves	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e659
e. Not visit multiple farms in the same day	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e660
f. Other (specify: _____)	<input type="checkbox"/> ₁	<input type="checkbox"/> ₂	<input type="checkbox"/> ₃	e661/e661oth

G. FARM VEHICLES AND EQUIPMENT

1. Were the following vehicles on this farm in the past 14 days? If "Yes," was the vehicle shared with another farm? If "Yes," was it disinfected prior to returning to this farm and who was the vehicle shared with?

Vehicle type	On farm in past 14 days?	If "Yes", was it shared with another farm?	If "Yes,"		
			Was it disinfected prior to returning to this farm?	Who was it shared with? [Enter DK if don't know.]	
a. Company trucks/trailers (e.g., pickup truck, trailer with supplies, supervisor truck, etc.)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e662/e671/ e680/e689
b. Feed trucks	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e663/e672/ e681/e690
c. Pullet delivery vehicles (i.e., placing pullets)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e664/e673/ e682/e691
d. Bird removal vehicles	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e665/e674/ e683/e692
e. Egg delivery vehicles	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e666/e675/ e684/e693
f. Egg removal vehicles	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e667/e676/ e685/e694
g. Manure/litter hauling	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e668/e677/ e686/e695
h. ATV/4-wheeler	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e669/e678/ e687/e696
i. Other (specify: _____)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e670/e670oth e679/e688/e697

2. Were the following pieces of equipment on this farm in the past 14 days? If "Yes," was the equipment shared with another farm? If "Yes," was it disinfected prior to returning to this farm and who was the equipment shared with?

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Equipment type	On farm in past 14 days?	If "Yes", was it shared with another farm?	If "Yes,"		
			Was it disinfected prior to returning to this farm?	Who was it shared with? [Enter DK if don't know.]	
a. Gates/panels	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e698/e708/ e718/e728
b. Lawn mowers	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e699/e709/ e719/e729
c. Live haul loaders	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e700/e710/ e720/e730
d. Egg racks or pallets	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e701/e711/ e721/e731
e. Egg flats	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e702/e712/ e722/e732
f. Pressure sprayers/washers	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e703/e713/ e723/e733
g. Skid-steer loaders	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e704/e714/ e724/e734
h. Litter handling	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e705/e715/ e725/e735
i. Manure handling	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e706/e716/ e726/e736
j. Other (specify: _____)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		e707 e717/ e727/e737/ e707oth

H. EGG HANDLING

- Were any eggs from this farm marketed in the past 14 days as:
 - Shell eggs?.....e801 ☐₁ Yes ☐₃ No – **Skip to 1b**
 - Washed and sanitized eggs?.....e802 ☐₁ Yes ☐₃ No
 - Nest runs?.....e803 ☐₁ Yes ☐₃ No
 - Liquid eggs (sent to further processing)?.....e804 ☐₁ Yes ☐₃ No
 - Which best describes the **primary** location for shell egg processing (washing, grading, and packing into cartons)? [Check one only.].....e805

☐₁ On-farm

☐₂ Off-farm – **Skip to Question 4**
 - Are shell eggs from other farms processed on this farm (i.e., side-loading)?.....e806 ☐₁ Yes ☐₃ No
- Go to Section I.**

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4. When shell eggs are processed off-farm, what is the:
- Average number of days between egg pickups from the farm?.....e807 _____ days
 - Distance (in miles) to the processing plant where the majority of the eggs are processed?.....e808 _____ miles
 - What is name of the processing plant?.....e809 _____

I. LITTER AND MANURE HANDLING

- Is litter (bedding) used on this farm?.....e901 ☐₁ Yes ☐₃ No – *Skip to Question 10*
- What was the last day that litter was brought onto the farm?.....e902 _____ mm/dd/yy
- Who brought the litter onto the farm: e903
 - Company personnel?
 - Litter provider?
 - Other (specify: _____)? e903oth
- What is the source (i.e., company name) of the litter? e904

- Is the litter heat treated prior to delivery?.....e905 ☐₁ Yes ☐₃ No ☐₄ Don't Know
- Is litter stored on the farm prior to use:
 - Outside? e906 ☐₁ Yes ☐₃ No
 - If "Yes," is it covered? e907 ☐₁ Yes ☐₃ No
 - In a shed? e908 ☐₁ Yes ☐₃ No
 - If "Yes," is the shed closed? e909 ☐₁ Yes ☐₃ No

If both 6a and 6b are "No," skip to Question 8.

- What is the minimum distance (in yards) from the on-site litter storage area to the nearest barn?.....e910 _____ yards
- Prior to use, is litter accessible to:
 - Wild birds? e911 ☐₁ Yes ☐₃ No
 - Wild animals (e.g., raccoons, opossum, coyotes, foxes)?..... e912 ☐₁ Yes ☐₃ No
 - Domestic animals (e.g., dogs, cats)? e913 ☐₁ Yes ☐₃ No
- What was the date that litter was last removed from any barn on this farm? e914 _____ mm/dd/yy
- Has manure or used litter from other farms been spread on this farm or adjacent farms? e915 ☐₁ Yes ☐₃ No ☐₄ Don't Know

If "Yes," what was the last date: e916 _____ mm/dd/yy

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11. Which of the following manure handling methods are used for barns on this operation?

- | | |
|--|--|
| a. High rise (pit at ground level with house above).....e917 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| b. Deep pit (below ground).....e918 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| c. Shallow pit (ground level).....e919 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| d. Raised slats over floor (no manure belt).....e920 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| e. Flush system to a lagoon or slurry pit.....e921 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| i. If "Yes," is lagoon water used to flush barns?.....e922 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| f. Manure belt.....e923 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| g. Scraper system (not flush or pit).....e924 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| h. Drop board.....e925 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |

12. Excluding belt system, how often is manure removed from the barn?..e926m/e926y _____ # / month
OR
_____ # / year

13. Is manure stored on farm (not including high rise pits)?.....e927 ☐₁ Yes ☐₃ No – *Skip to Question 16*

14. Is manure stored:

- | | |
|--|--|
| a. In an enclosed building?.....e928 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| b. In an open structure (e.g., 3 sided building)?.....e929 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| c. In a lagoon?.....e930 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| d. Outside other than lagoon?.....e931 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |

15. What is the minimum distance (in yards) from the on-site manure storage area to the nearest barn?.....e932 _____ yards

16. How was manure most recently disposed of?

- | | |
|---|--|
| a. Composted on farm.....e933 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| If "Yes," | |
| i. What is the distance (in yards) to the nearest poultry house?.....e934 | _____ yards |
| ii. Is manure composted in a composting building?.....e935 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| b. Applied to land on this farm.....e936 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| If "Yes," what was the date manure was applied to land?.....e937 _____ mm/dd/yy | |
| c. Taken off site.....e938 | <input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No |
| If "Yes," name and location: _____ h711 | |

J. DEAD BIRD DISPOSAL

1. What is the approximate normal daily mortality on this farm?.....e1001 _____ # / 1000 birds

2. What are the method(s) of dead bird (daily mortality) disposal on this farm?

a. Compostinge1002	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No
b. Buriale1003	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No
c. Incineratione1004	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No
d. Renderinge1005	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No
e. Landfille1006	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No
f. Other (specify: _____) ..e1007/ e1007oth	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No

3. If 2a (composting) or 2b (burial) are "Yes," how frequently are carcasses covered with:

a. Soil?e1008	<input type="checkbox"/> ₁ Daily <input type="checkbox"/> ₂ Every 2 or more days <input type="checkbox"/> ₃ Never
b. Manure?e1009	<input type="checkbox"/> ₁ Daily <input type="checkbox"/> ₂ Every 2 or more days <input type="checkbox"/> ₃ Never

4. If 2d (rendering) is "Yes,"

a. Is the carcass bin kept covered?e1010	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No
b. Are carcasses [Check one only.]	e1011
<input type="checkbox"/> ₁ Taken by the producer/worker to the renderer?	
<input type="checkbox"/> ₂ Picked up by the renderer from the farm?	
c. How frequently are carcasses moved to the renderer?.....e1012	_____ # times/week
d. What were the dates of the pick-ups in the past 14 days?	_____ mm/dd/yy e1013
e. What is the name of the company that handles this farm's rendering?	_____ e1014

5. What do workers do after handling the carcass bin before returning to the live poultry area? e1015

6. Have any wild birds or wild mammals been observed around the dead bird collection area (i.e., burial, compost pile, rendering, etc.) in the past 14 days?

a. Wild birds.....e1016	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No
b. Wild mammalse1017	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No

7. Is there a common collection point (i.e., located off the farm) for dead bird disposal?.....e1018 ☐₁ Yes ☐₃ No
 If "Yes," where is the common collection point located? _____ e1019

K. WEATHER CONDITIONS

1. In the past 14 days, how would you describe the wind? e1101

<input type="checkbox"/> ₁ Windier than normal	<input type="checkbox"/> ₂ Normal	<input type="checkbox"/> ₃ Less windy than normal	<input type="checkbox"/> ₄ Not sure
---	--	--	--

2. In the past 14 days, how would you describe the humidity? e1102

<input type="checkbox"/> ₁ Drier than normal	<input type="checkbox"/> ₂ Normal	<input type="checkbox"/> ₃ Wetter than normal	<input type="checkbox"/> ₄ Not sure
---	--	--	--

BARN LEVEL QUESTIONS

INSTRUCTIONS:

1. **Control farm:** Select one barn to complete this section. Answer questions for the 14 days prior to the reference date specified on page 4. Complete *only* the "Control Barn" column.
2. **Case farm:** 1) Select the *first* barn on this premises that was confirmed to be HPAI positive. Answer questions in the "Case Barn" column for the 14 days prior to the onset of clinical signs or increased mortality. 2) Select one barn at random on this premises that is not HPAI positive. Select a barn that has birds present and is experiencing normal mortality. The Control Barn should physically be a separate structure from any infected barns. Answer questions in the "Control Barn" column for the same 14 day time period (i.e., the 14 days prior to the onset of clinical signs or increased mortality in any barn on this premises). If all barns on the premises are infected, leave "Control Barn" column blank.

	CASE BARN	CONTROL BARN	
1. What is the barn ID?			e1201/ e1300
2. What type(s) of poultry are present in this barn?			e1202/ e1302
a. Pullet	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1203/ e1303
b. Layer	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1204/ e1304
c. Breeder	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1205/ e1305
d. Other	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No If "Yes," specify: _____	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No If "Yes," specify: _____	e1206/ e1206oth e1306/ e1306oth
3. How many birds were placed in this barn?	_____ # birds	_____ # birds	e1207/ e1307
4. What was the date of placement in this barn?	_____ mm/dd/yy	_____ mm/dd/yy	e1208/ e1308
5. How old were birds when placed in this barn?	_____ weeks	_____ weeks	e1209/ e1309
6. Which of the following strains were in the layer flock? [Check one only.]	<input type="checkbox"/> ₁ White egg strain <input type="checkbox"/> ₂ Brown egg strain	<input type="checkbox"/> ₁ White egg strain <input type="checkbox"/> ₂ Brown egg strain	e1210/ e1310
7. Which of the following breeds were in the layer flock? [Check one only.]	<input type="checkbox"/> ₁ Hyline <input type="checkbox"/> ₂ Lohmann <input type="checkbox"/> ₃ Centurion <input type="checkbox"/> ₄ Other (specify: _____)	<input type="checkbox"/> ₁ Hyline <input type="checkbox"/> ₂ Lohmann <input type="checkbox"/> ₃ Centurion <input type="checkbox"/> ₄ Other (specify: _____)	e1211/ e1311
8. Has this flock been molted?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1212/ e1312

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	CASE BARN	CONTROL BARN	
9. Did birds in this barn have outside access?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1213/ e1313
10. What was the bird density in the barn?	_____ sq in/bird	_____ sq in/bird	e1214/ e1314
11. Was there another health concern in this flock in the past 14 days?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No If "Yes," specify condition: _____ _____	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No If "Yes," specify condition: _____ _____	e1215/ e1215sp e1315/ e1315spe
12. Was this flock being treated for a condition or health concern in the past 14 days?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1216/ e1316
13. Was this flock vaccinated in the past 14 days?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1217/ e1317
14. How are birds housed in this barn? [Enter code 1, 2, or 3.] 1. Conventional cage 2. Enriched cage 3. Cage free	_____ code If "3, Cage free," Skip to Question 16.	_____ code If "3, Cage free," Skip to Question 16.	e1218/ e1318
15. Are cages curtain backed?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1219/ e1319
16. Do birds have access to droppings from other birds (e.g., manure belt running across top tier of cage)?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1220/ e1320
17. How old is this barn structure?	_____ years	_____ years	e1221/ e1321
18. How long has it been since the last remodel of the barn structure?	_____ years	_____ years	e1222/ e1322

	CASE BARN	CONTROL BARN	
19. How well has the barn structure been maintained? <i>[Enter code 1, 2, or 3.]</i> 1. Well E.g., Concrete foundation, no visible daylight, the barn is tight, intact inlet vent screens, doors well sealed 2. Moderate E.g., Barn tin could have rust or small holes, intact inlet vent screens, doors not completely sealed 3. Poor E.g., Holes in walls are apparent, tin is rusted, may have leaks in roof, there might be some holes large enough for wild birds to enter, multiple areas with daylight visible, inlet vent screens not intact, doors not sealed	_____ code	_____ code	e1223/ e1323
20. Is there a buffer area between the barn and the outdoors which limits movement of air flow from the outside to the birds?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1224/ e1324
21. What is the type of ventilation for this barn? <i>[Enter Code 1-4.]</i> 1. Curtain ventilated 2. Sidewall inlet 3. Ceiling or eaves inlet 4. Tunnel ventilation (may have side wall or ceiling inlets)	_____ code	_____ code	e1225/ e1325
22. Where are fans located?	<input type="checkbox"/> ₁ Sidewall <input type="checkbox"/> ₂ End of barn <input type="checkbox"/> ₃ Both	<input type="checkbox"/> ₁ Sidewall <input type="checkbox"/> ₂ End of barn <input type="checkbox"/> ₃ Both	e1226/ e1326
23. Is intake air filtered?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No If "Yes," specify type of filter: _____	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No If "Yes," specify type of filter: _____	e1227/ 1227spe e1327/ e1327spe

	CASE BARN	CONTROL BARN	
24. Describe ventilation protocol for the past 14 days.			e1228/ e1328
25. Which best describes the ground surface immediately surrounding (within 1 yard) this barn (excluding vehicle approach and loading area)? [Enter Code 1-4.] 1. Gravel or hard surface 2. Dirt 3. Short grass 4. Tall grass or brush	_____ code	_____ code	e1229/ e1329
26. Does this barn have a hard surface entry pad (e.g., concrete, asphalt)?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1230/ e1330
If "Yes," a. Is the entry pad cleaned and how frequently?	<input type="checkbox"/> ₁ Yes, <input type="checkbox"/> ₃ No If "Yes," specify frequency:	<input type="checkbox"/> ₁ Yes, <input type="checkbox"/> ₃ No If "Yes," specify frequency:	e1231/ e1231spe e1331/ e1331spe
b. Is disinfectant used?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1232/ e1332
27. Does this barn have:			
a. Locks on the doors?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1233/ e1333
b. A service room that personnel must enter through that separates "outside area" from "inside area"?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1234/ e1334
c. Changing area for employees	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1235/ e1335
d. A shower for employees?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1236/ e1336
e. Cool cell pads?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1237/ e1337
f. Misters?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1238/ e1338
28. What type of footbath is in use at this barn? [Enter Code 1-4.] 1. Dry (i.e., powdered or particulate) 2. Liquid 3. Other 4. None	_____ code If "3-Other," specify: If "4 – None," Skip to Question 31.	_____ code If "3-Other," specify: If "4 – None," Skip to Question 31.	e1239/ e1239oth e1339/ e1339oth

	CASE BARN	CONTROL BARN	
29. What is the frequency that footbath solutions are changed?	_____ times/ <input type="checkbox"/> ₁ day, <input type="checkbox"/> ₂ week, or <input type="checkbox"/> ₃ month	_____ times/ <input type="checkbox"/> ₁ day, <input type="checkbox"/> ₂ week, or <input type="checkbox"/> ₃ month	e1240t/ e1240u e1340t/ e1340u
30. What disinfectant is used in the footbaths?	specify: _____	specify: _____	e1241/ e1341
31. Does this barn have drop boards?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1242/ e1342
32. Is litter used in this barn?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No <i>If "No," skip to Question 38.</i>	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No <i>If "No," skip to Question 38.</i>	e1243/ e1343
33. What type(s) of litter is used in this barn? [Enter Code 1-4.] 1. Wood shavings 2. Hulls (e.g., oat, rice, sunflower, other) 3. Straw 4. Other	_____ code <i>If "4 - Other," specify:</i> _____	_____ code <i>If "4 - Other," specify:</i> _____	e1244/ e1244oth e1344/ e1344oth
34. Is the litter bagged (i.e., baled) or bulk (i.e., load from shavings mill)?	<input type="checkbox"/> ₁ Bag <input type="checkbox"/> ₃ Bulk	<input type="checkbox"/> ₁ Bag <input type="checkbox"/> ₃ Bulk	e1245/ e1345
35. Who are the supplier(s)/source(s) of litter?			e1246/ e1346
36. Was litter "tilled" since it was placed in the barn?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1247/ e1347
If "Yes," when was it tilled?	_____ mm/dd/yy	_____ mm/dd/yy	e1248/ e1348
37. How many times was litter added to the barn in the past 14 days?	_____ times	_____ times	e1249/ e1349
38. When was the last full clean out of litter or manure?	_____ mm/dd/yy	_____ mm/dd/yy	e1250/ e1350
39. Were birds present during the last full cleanout?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1251/ e1351
40. Who performed the last full cleanout? [Enter Code 1 or 2.] 1. Producer 2. Contractor	_____ code	_____ code	e1252/ e1352
If contractor, specify name and location.	specify: n _____ l _____	specify: n _____ l _____	e1253n/ e1253l e1353n/ e1353l

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	CASE BARN	CONTROL BARN	
41. Were the following wild birds seen in this barn in the past 14 days?			
a. Large birds (e.g., pigeons, crows)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1254/ e1354
b. Small birds (e.g., finches, sparrows, starlings)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1255/ e1355
42. What is the distance (in yards) of the closest body of water to this barn?	_____ yards	_____ yards	e1256/ e1356
43. Were wild waterfowl observed on this body of water in the past 14 days?	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1257/ e1357
44. How far is this barn (in yards) from:			
a. Dead bird disposal/holding area including carcass bin for rendering	_____ yards	_____ yards	e1258/ e1358
b. Nearest road	_____ yards	_____ yards	e1259/ e1359
45. Did any of the following types of people enter this barn in the past 14 days?			
a. Federal/state veterinary or animal health worker	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1260/ e1360
b. Extension agent or university veterinarian	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1261/ e1361
c. Private or company veterinarian	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1262/ e1362
d. Company service person	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1263/ e1363
e. Nutritionist or feed company consultant	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1264/ e1364
f. Pullet delivery	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1265/ e1365
g. Vaccination crew	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1266/ e1366
h. Catch crew	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1267/ e1367
i. Feed delivery personnel	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1268/ e1368
j. Egg truck personnel	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1269/ e1369
k. Litter services (delivery, pick-up)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1270/ e1370
l. Customer (private individual)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1271/ e1371
m. Wholesaler, buyer, or dealer	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1272/ e1372
n. Renderer	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1273/ e1373

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	CASE BARN	CONTROL BARN	
o Occasional worker (e.g., family member, part time help over holiday)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1274/ e1374
p. Construction workers	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1275/ e1375
q. Other business visitors (including other producers, meter readers, package delivery (UPS), repair person, wildlife services, and service personnel)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1276/ e1376
r. Other nonbusiness visitors (including neighbors, friends, and school field trips)	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No	e1277/ e1377
46. Where specifically in this barn did increased mortality or clinical signs first appear (e.g., near entry, near vents, back of barn. Diagram may help)?		NA	e1278
47. Was there a pattern of spread in the barn? If "Yes," describe.	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No If "Yes," describe: _____ _____	NA	e1279/ e1279d
48. What was the <i>first</i> indication of infection within the barn?		NA	e1280 e1281 e1282/ e1282spe
a. Surveillance testing	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		
b. Increased mortality	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No		
c. Clinical signs	<input type="checkbox"/> ₁ Yes <input type="checkbox"/> ₃ No If "Yes," (specify: _____ _____)		

COMMENT SECTION:

Please use this section for anything else that you would like to add. For example, how do you think HPAI is spreading within your geographic area?

CHECKLIST

INSTRUCTIONS

This section refers to data that can be acquired through other sources.

1. Please verify grayed areas from the questionnaire.
2. If possible, attach a diagram, farm map or photographs showing orientation of barn(s) including barn numbers, water location, feed storage, rendering bin, litter storage, ventilation, and windbreaks.
3. For the first infected barn, attach a diagram including proximity of initial infection to vents, doors, personnel entrances, manure storage, and other potential contributing factors.
4. How many commercial poultry farms (of any production type) are located:
 - a. Within 1 mile of this farm?e1401 _____ #
 - b. Within 3 miles of this farm?e1402 _____ #
5. How far (in yards or in miles) is the nearest backyard flock to this farm? ..e1403y/e1403m _____ yards
OR
_____ miles
6. How far (in yards or in miles) is the nearest HPAI positive premises
to this farm? e1404y/e1404m _____ yards
OR
_____ miles
7. Inquire about truck routing. Are feed trucks, egg trucks, and live haul trucks routed in particular way? E.g., to avoid driving past a known positive farm, to avoid delivering to a known positive farm, or to visit known positive farms last? Please explain.
8. Collect mortality sheets from both case and control barns.
9. Collect ventilation control records from both case and control barns for the past 14 days.
10. Which feed mill supplies feed to this farm? e1405 _____

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Appendix G

Examples of Movement Control Notices

This appendix provides examples, both Federal and State, of halting movement of animals during a disease outbreak. Each State has different authorities and processes regarding movement controls—frequently called a “stop movement order” or a “hold order”—in response to an animal health emergency.

EXAMPLE—KANSAS (2015)

Manhattan, Kansas – In an effort to protect the Kansas poultry industry and to promote stronger biosecurity practices throughout the state, Kansas Department of Agriculture Division of Animal Health has issued a stop movement order, signed by Secretary of Agriculture Jackie McClaskey, targeting Kansas poultry and live birds, effectively cancelling all poultry-related shows and events through calendar year 2015. This includes all types of poultry activities where birds from different flocks are co-mingled.

This will include, but is not limited to: regional and county fairs, festivals, the Kansas State Fair, swap meets, exotic sales and live bird auctions. This measure is being implemented in an effort to prevent the spread of highly pathogenic H5N2 avian influenza (HPAI). Kansas experienced a positive case of HPAI in Leavenworth County in March 2015.

This decision was made after careful consideration and consultation with the K-State Research and Extension, Kansas 4-H, Kansas State Fair representatives and other poultry industry officials. Dr. Justin Smith, Deputy Animal Health Commissioner made the announcement.

“The decision to issue movement restrictions regarding poultry and bird events has been made in an effort to protect the poultry industry in Kansas and the economic contribution that the industry makes to our agricultural economy. It is a difficult decision, as I know youth and adults would soon be exhibiting their projects at local fairs,” said Smith. “This decision was not made lightly, but it is necessary we do everything possible to protect the Kansas poultry flock.”

K-State Research and Extension and Kansas 4-H, along with the Kansas State Fair, is working to identify options for youth enrolled in poultry projects to showcase their learning and participate in fairs in ways other than having their birds present.

It is important that all poultry producers continue to monitor their flocks for symptoms of the virus, and notify KDA immediately if they suspect any problems. All bird owners, whether commercial producers or backyard enthusiasts, should prevent contact between their birds and other birds including wild fowl.

If you see sickness in birds, please contact KDA Division of Animal Health at (785) 564-6601 or email HPAI@kda.ks.gov. Additional information about HPAI can be found online at www.agriculture.ks.gov/avianinfluenza.

Source: <http://agriculture.ks.gov/AllNewsItems/2015/06/09/movement-restrictions-for-poultry-events-exhibitions-and-sales-issued-in-kansas>

EXAMPLE—NORTH DAKOTA (2015)

BISMARCK, N.D. – To protect North Dakota’s poultry industry from potential exposure to H5 avian influenza virus, the State Board of Animal Health (BOAH) has halted bird movement to shows, exhibitions and public sales within the state in which birds from different locations are intermingled at an event. This does not apply to approved private sales that meet North Dakota importation requirements.

“The state board is taking this precaution to reduce the risk of avian influenza exposure to North Dakota birds,” State Veterinarian Dr. Susan Keller said. “Mixing birds could unnecessarily increase the risk of exposure.”

This board action prohibits the specified poultry/bird movements until further notice. BOAH is continuing to monitor and assess the disease threat, which will be reviewed at their June 10 quarterly meeting.

North Dakota has had two confirmed cases of avian influenza in commercial poultry operations in Dickey and LaMoure counties affecting over 100,000 birds. Nationally, the outbreak has affected nearly 10 million birds in 13 states.

Bird owners should immediately report death loss to their local and state veterinarian, restrict access to their property, prevent contact between their birds and wild birds and practice enhanced biosecurity.

State Veterinarian Dr. Susan Keller is reminding anyone bringing birds into North Dakota to contact the North Dakota Department of Agriculture’s Animal Health Division at 701-328-2655 to ensure they are meeting all importation requirements.

More information about avian influenza and biosecurity is available at www.nd.gov/ndda/disease/avian-influenza and from the USDA-APHIS at www.aphis.usda.gov.

Source: www.nd.gov/ndda/news/poultrybird-movements-limited-control-spread-avian-influenza.

EXAMPLE—WEST VIRGINIA (2007)

Commissioner of Agriculture Halts Poultry Shows and Sales after AI-Positive Flock Discovered in Virginia

Commissioner of Agriculture Gus R. Douglass has ordered a halt to poultry shows and sales throughout West Virginia in response to a turkey flock that tested positive for low pathogenicity avian influenza (LPAI) in Mt. Jackson, Va., just across the West Virginia border.

The strain is not the “bird flu” that has been plaguing Southeast Asia and parts of Europe and poses no threat to human health.

The order applies to any gathering of live birds, including shows at fairs and festivals and sales of poultry. The order is effective Monday, July 9, and will be in place for 30 days unless another positive flock is discovered.

The order does not apply to the commercial industry, which tests every flock for AI before it is moved off the farm to ensure that infected birds are not trucked past other poultry farms.

“Having already dealt with a positive flock in West Virginia earlier this year, we want to take every precaution to protect our poultry industry from a potentially devastating situation,” said Commissioner Douglass.

He also noted that the West Virginia Department of Agriculture is on high alert for any signs of the disease here, and that the industry has been exercising enhanced surveillance protocols since a 2002 AI outbreak that affected West Virginia and Virginia.

Poultry companies on both sides of the border have instructed their growers not to spread litter or move it from their farms until further notice.

According to the Virginia Department of Agriculture and Consumer Services (VDACS), testing over the weekend by the USDA’s National Veterinary Services Laboratory (NVSL) in Ames, Iowa, confirmed the presence of AI antibodies, which indicates possible prior exposure to the virus. The turkeys did not show any signs of illness prior to testing.

Virginia is closely monitoring all poultry operations within a six-mile radius of the affected farm.

NVSL is doing further testing to help identify the virus and hopefully determine its source. VDACS, USDA and the poultry owner are working cooperatively to minimize the possibility that the virus will move beyond this farm.

The affected flock contains 54,000 birds, which will be euthanized as a precaution as soon as possible and composted on-site. While LPAI poses no risk to human health, federal and state policy is to eradicate H5 and H7 subtypes because of their potential to change into more serious types, which have a higher mortality rate among birds.

Source: www.wvagriculture.org/news_releases/2007/7-9-07.html.

EXAMPLE—FEDERAL (2003)

Source: www.federalregister.gov/articles/2003/04/16/03-9322/exotic-newcastle-disease-additions-to-quarantined-area#p-3.



18531

Rules and Regulations

Federal Register

Vol. 68, No. 73

Wednesday, April 16, 2003

This section of the FEDERAL REGISTER contains regulatory documents having general applicability and legal effect, most of which are keyed to and codified in the Code of Federal Regulations, which is published under 50 titles pursuant to 44 U.S.C. 1510.

The Code of Federal Regulations is sold by the Superintendent of Documents. Prices of new books are listed in the first FEDERAL REGISTER issue of each week.

DEPARTMENT OF AGRICULTURE

Animal and Plant Health Inspection Service

9 CFR Part 82

[Docket No. 02-117-5]

Exotic Newcastle Disease; Additions to Quarantined Area

AGENCY: Animal and Plant Health Inspection Service, USDA.

ACTION: Interim rule and request for comments.

SUMMARY: We are amending the exotic Newcastle disease regulations by quarantining El Paso and Hudspeth Counties, TX, and Dona Ana, Luna, and Otero Counties, NM, and prohibiting or restricting the movement of birds, poultry, products, and materials that could spread exotic Newcastle disease from the quarantined area. This action is necessary on an emergency basis to prevent the spread of exotic Newcastle disease from the quarantined area.

DATES: This interim rule was effective April 10, 2003. We will consider all comments that we receive on or before June 16, 2003.

ADDRESSES: You may submit comments by postal mail/commercial delivery or by e-mail. If you use postal mail/commercial delivery, please send four copies of your comment (an original and three copies) to: Docket No. 02-117-5, Regulatory Analysis and Development, PPD, APHIS, Station 3C71, 4700 River Road Unit 118, Riverdale, MD 20737-1238. Please state that your comment refers to Docket No. 02-117-5. If you use e-mail, address your comment to regulations@aphis.usda.gov. Your comment must be contained in the body of your message; do not send attached files. Please include your name and address in your message and "Docket No. 02-117-5" on the subject line.

You may read any comments that we receive on this docket in our reading room. The reading room is located in room 1141 of the USDA South Building, 14th Street and Independence Avenue SW., Washington, DC. Normal reading room hours are 8 a.m. to 4:30 p.m., Monday through Friday, except holidays. To be sure someone is there to help you, please call (202) 690-2817 before coming.

APHIS documents published in the **Federal Register**, and related information, including the names of organizations and individuals who have commented on APHIS dockets, are available on the Internet at <http://www.aphis.usda.gov/ppd/rad/webrepor.html>.

FOR FURTHER INFORMATION CONTACT: Dr. Aida Boghossian, Senior Staff Veterinarian, Emergency Programs Staff, VS, APHIS, 4700 River Road Unit 41, Riverdale, MD 20737-1231; (301) 734-8073.

SUPPLEMENTARY INFORMATION:

Background

Exotic Newcastle disease (END) is a contagious and fatal viral disease affecting the respiratory, nervous, and digestive systems of birds and poultry. END is so virulent that many birds and poultry die without showing any clinical signs. A death rate of almost 100 percent can occur in unvaccinated poultry flocks. END can infect and cause death even in vaccinated poultry.

The regulations in "Subpart A—Exotic Newcastle Disease (END)" (9 CFR 82.1 through 82.15, referred to below as the regulations) were established to prevent the spread of END in the United States in the event of an outbreak. In § 82.3, paragraph (a) provides that any area where birds or poultry infected with END are located will be designated as a quarantined area, and that a quarantined area is any geographical area, which may be a premises or all or part of a State, deemed by epidemiological evaluation to be sufficient to contain all birds or poultry known to be infected with or exposed to END. Less than an entire State will be designated as a quarantined area only if the State enforces restrictions on intrastate movements from the quarantined area that are at least as stringent as the regulations. The regulations prohibit or restrict the movement of birds, poultry, products,

and materials that could spread END from quarantined areas. Areas quarantined because of END are listed in § 82.3, paragraph (c).

On October 1, 2002, END was confirmed in the State of California. The disease was confirmed in backyard poultry, which are raised on private premises for hobby, exhibition, and personal consumption, and in commercial poultry.

In an interim rule effective on November 21, 2002, and published in the **Federal Register** on November 26, 2002 (67 FR 70674-70675, Docket No. 02-117-1), we amended the regulations in § 82.3(c) by quarantining Los Angeles County, CA, and portions of Riverside and San Bernardino Counties, CA, and restricting the interstate movement of birds, poultry, products, and materials that could spread END from the quarantined area.

In a second interim rule effective on January 7, 2003, and published in the **Federal Register** on January 13, 2003 (68 FR 1515-1517, Docket No. 02-117-2), we further amended § 82.3(c) by adding Imperial, Orange, San Diego, Santa Barbara, and Ventura Counties, CA, and the previously non-quarantined portions of Riverside and San Bernardino Counties, CA, to the list of quarantined areas. Because the Secretary of Agriculture signed a declaration of extraordinary emergency with respect to the END situation in California on January 6, 2003 (see 68 FR 1432, Docket No. 03-001-1, published January 10, 2003), that second interim rule also amended the regulations to provide that the prohibitions and restrictions that apply to the interstate movement of birds, poultry, products, and materials that could spread END will also apply to the intrastate movement of those articles in situations where the Secretary of Agriculture has issued a declaration of extraordinary emergency (new § 82.16).

On January 16, 2003, END was confirmed in backyard poultry on a premises in Las Vegas, NV. Therefore, in a third interim rule effective January 17, 2003, and published in the **Federal Register** on January 24, 2003 (68 FR 3375-3376, Docket No. 02-117-3), we amended § 82.3(c) by quarantining Clark County, NV, and a portion of Nye County, NV, and prohibiting or restricting the movement of birds, poultry, products, and materials that

could spread END from the quarantined area. On January 17, 2003, the Secretary of Agriculture signed a declaration of extraordinary emergency because of END in Nevada (see 68 FR 3507, Docket No. 03-001-2, published January 24, 2003).

On February 4, 2003, END was confirmed in backyard poultry on a premises in the Colorado River Indian Nation in Arizona. Therefore, in a fourth interim rule effective February 10, 2003, and published in the **Federal Register** on February 14, 2003 (68 FR 7412-7413, Docket No. 02-117-4), we amended § 82.3(c) by quarantining La Paz and Yuma Counties, AZ, and a portion of Mohave County, AZ, and prohibiting or restricting the movement of birds, poultry, products, and materials that could spread END from the quarantined area. On February 7, 2003, the Secretary of Agriculture signed a declaration of extraordinary emergency because of END in Arizona (see 68 FR 7338, Docket No. 03-001-3, published February 13, 2003).

On April 9, 2003, END was confirmed in backyard poultry on a premises in El Paso County, TX. Therefore, in this interim rule, we are amending § 82.3(c) by designating El Paso and Hudspeth Counties, TX, and Dona Ana, Luna, and Otero Counties, NM, as a quarantined area and prohibiting or restricting the movement of birds, poultry, products, and materials that could spread END from the quarantined area. As provided for by the regulations in § 82.3(a), this quarantined area encompasses the area where poultry infected with END were located and a surrounding geographical area deemed by epidemiological evaluation to be sufficient to contain all birds or poultry known to be infected with or exposed to END.

Emergency Action

This rulemaking is necessary on an emergency basis to prevent the spread of END. Under these circumstances, the Administrator has determined that prior notice and opportunity for public comment are contrary to the public interest and that there is good cause under 5 U.S.C. 553 for making this rule effective less than 30 days after publication in the **Federal Register**.

We will consider comments that we receive during the comment period for this interim rule (see **DATES** above). After the comment period closes, we will publish another document in the **Federal Register**. The document will include a discussion of any comments we receive and any amendments we are making to the rule.

Executive Order 12866 and Regulatory Flexibility Act

This rule has been reviewed under Executive Order 12866. For this action, the Office of Management and Budget has waived its review under Executive Order 12866.

This rule amends the regulations by quarantining El Paso and Hudspeth Counties, TX, and Dona Ana, Luna, and Otero Counties, NM, and prohibiting or restricting the movement of birds, poultry, products, and materials that could spread END from the quarantined area. This action is necessary on an emergency basis to prevent the spread of END from the quarantined area.

This emergency situation makes timely compliance with section 604 of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) impracticable. We are currently assessing the potential economic effects of this action on small entities. Based on that assessment, we will either certify that the rule will not have a significant economic impact on a substantial number of small entities or publish a final regulatory flexibility analysis.

Executive Order 12372

This program/activity is listed in the Catalog of Federal Domestic Assistance under No. 10.025 and is subject to Executive Order 12372, which requires intergovernmental consultation with State and local officials. (See 7 CFR part 3015, subpart V.)

Executive Order 12988

This rule has been reviewed under Executive Order 12988, Civil Justice Reform. This rule: (1) Preempts all State and local laws and regulations that are in conflict with this rule; (2) has no retroactive effect; and (3) does not require administrative proceedings before parties may file suit in court challenging this rule.

Paperwork Reduction Act

This rule contains no new information collection or recordkeeping requirements under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*).

List of Subjects in 9 CFR Part 82

Animal diseases, Poultry and poultry products, Quarantine, Reporting and recordkeeping requirements, Transportation.

■ Accordingly, 9 CFR part 82 is amended as follows:

PART 82—EXOTIC NEWCASTLE DISEASE (END) AND CHLAMYDIOSIS; POULTRY DISEASE CAUSED BY SALMONELLA ENTERITIDIS SEROTYPE ENTERITIDIS

■ 1. The authority citation for part 82 continues to read as follows:

Authority: 7 U.S.C. 8301-8317; 7 CFR 2.22, 2.80, and 371.4.

■ 2. In § 82.3, paragraph (c) is amended by adding, in alphabetical order, entries for New Mexico and Texas to read as follows:

§ 82.3 Quarantined areas.

* * * * *

(c) * * *

* * * * *

New Mexico

Dona Ana County. The entire county.
Luna County. The entire county.
Otero County. The entire county.

Texas

El Paso County. The entire county.
Hudspeth County. The entire county.

Done in Washington, DC, this 10th day of April 2003.

Bobby R. Acord,

Administrator, Animal and Plant Health Inspection Service.

[FR Doc. 03-9322 Filed 4-15-03; 8:45 am]

BILLING CODE 3410-34-P

FARM CREDIT ADMINISTRATION

12 CFR Part 615

RIN 3052-AC05

Funding and Fiscal Affairs, Loan Policies and Operations, and Funding Operations; Capital Adequacy

AGENCY: Farm Credit Administration.

ACTION: Final rule.

SUMMARY: The Farm Credit Administration (FCA or agency) amends its capital adequacy regulations to add a definition of total liabilities for the net collateral ratio calculation, limit the amount of term preferred stock that may count as total surplus, clarify the circumstances in which we may waive disclosure requirements for an issuance of equities by a Farm Credit System (FCS, Farm Credit or System) institution, and make several nonsubstantive technical changes. These amendments update, modify, and clarify certain capital requirements.

EFFECTIVE DATE: This regulation will become effective 30 days after publication in the **Federal Register** during which either or both houses of

Appendix H

Available AI Vaccines

INFORMATION ABOUT VACCINE

This section provides general information about two types of avian influenza (AI) vaccine that might be used during an outbreak response effort. Stamping-out remains the primary response strategy for a highly pathogenic avian influenza (HPAI) outbreak in the United States. There are a multitude of factors that are considered in any decision to vaccinate U.S. poultry flocks.

Much work is currently being conducted on vaccines to protect against AI; this quick reference appendix may be updated at any time. Novel vaccine technologies are being developed; current technologies are being improved and undergoing further safety and efficacy testing. For example, there is an existing turkey herpesvirus (HVT) AI vaccine for use in 1 day old chicks that could be further developed and tested.

Inactivated Avian Influenza Vaccines

For poultry, these vaccines are usually made as oil emulsions. Historically, inactivated vaccines contain field strains of low pathogenicity avian influenza viruses that are matched with the same hemagglutinin subtype. In order to be highly effective, the H5 in the vaccine strain should closely match the outbreak strain. Inactivated vaccines are not safe for use for poultry less than 2–3 weeks of age (i.e., for first dose). Two doses may be required, particularly in birds with extended life-spans, such as breeders and layers. These vaccines have been used in other avian species, though this does not imply associated efficacy testing has been completed. Use in any animal besides chickens or turkeys must be considered experimental, which should be weighed when considering its use in off-label species.

It would be possible to use inactivated vaccine and a companion diagnostic test for differentiating infected and vaccinated animals (DIVA),¹ if the neuraminidase was different than the field strain: a DIVA strategy would monitor for N antibodies matching the field strain, indicating infection in vaccinated animals.

A pre-vaccination AI test may be required. Withdrawal prior to slaughter is 42 days (6 weeks). The killed vaccine may provide some cross-protection depending on the outbreak strain of virus, but this must always be evaluated at the

¹ This is sometimes also called detecting infection in vaccinated animals.

time of the outbreak. Maternal antibodies can be passed to progeny, resulting in seropositive test results in progeny for a period.

Live Recombinant Vaccine

Another possibility is a live, fowlpox-vectored H5 vaccine. Fowlpox vaccines replicate well only in chickens, and have been licensed for emergency use in this species. However, experimental evidence is needed to demonstrate how well these vaccines protect against the current outbreak strain. In addition, use in any animal besides chickens must be considered experimental. This should be weighed when considering the use of vaccine in off-label species. It would be possible to use this vaccine as a DIVA vaccine.

Fowlpox-vectored AI vaccines must be given individually to birds by injection, but can be given to chickens 1 day or older. Chickens should not have received a prior fowlpox vaccination. A booster vaccination with a killed virus vaccine may be applied 2–3 weeks later. Withdrawal time prior to slaughter is 21 days (3 weeks).

Appendix I

USDA Response Process for Infected Premises

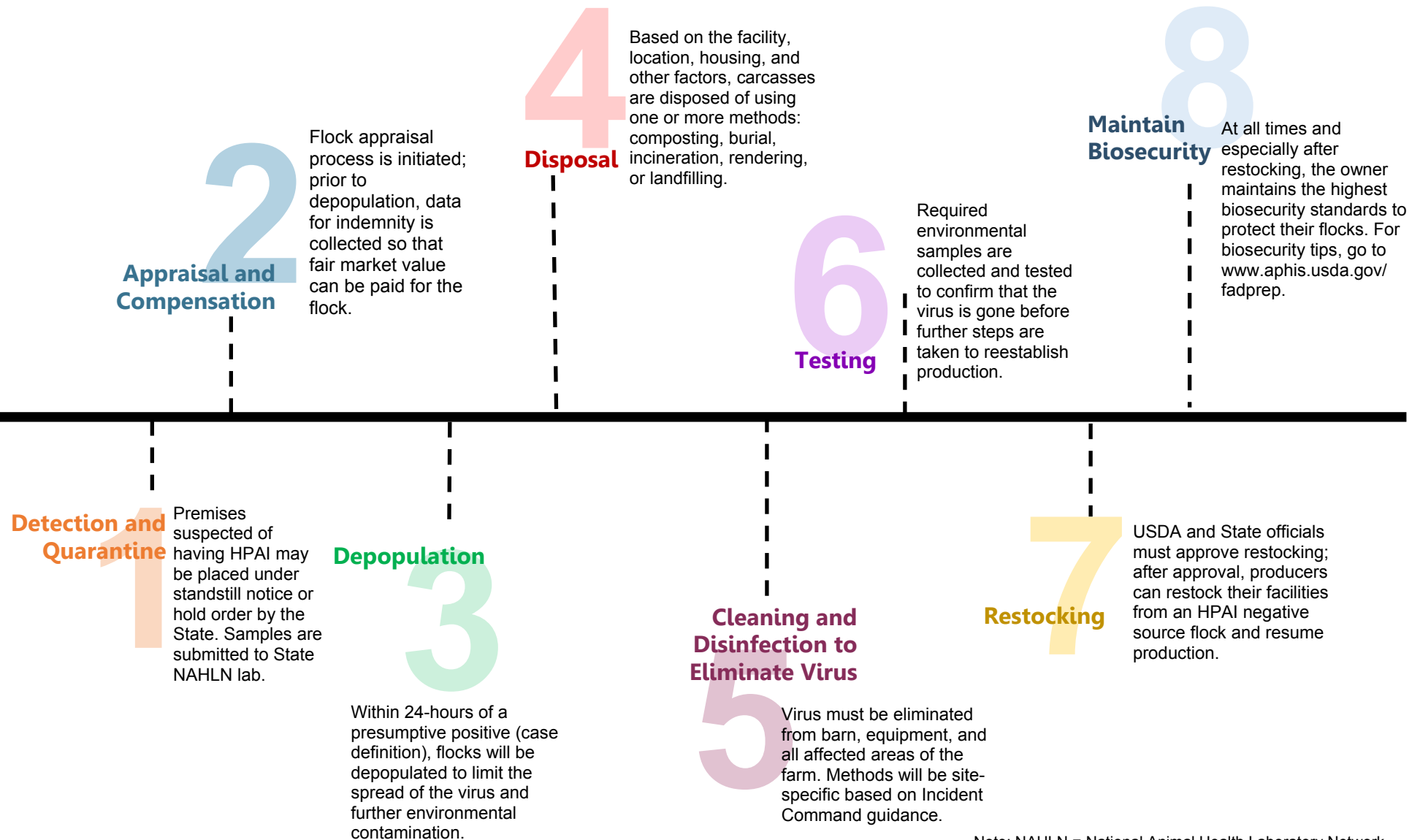
This attachment contains succinct guidance about the step-by-step process of U.S. Department of Agriculture (USDA) highly pathogenic avian influenza (HPAI) response. It highlights the entire response process for an Infected Premises, from detection to restocking.



United States
Department of
Agriculture

Highly Pathogenic Avian Influenza

USDA Response Process



Note: NAHLN = National Animal Health Laboratory Network.

Appendix J

Glossary

Animal product	Blood or any of its components, bones, bristles, feathers, flesh, offal, skins, and any by product containing any of those components that originated from an animal or bird.
Anseriformes	An order of birds that includes ducks, geese, and swans. There are about 150 living species of birds in three extant families: the Anhimidae (the screamers), Anseranatidae (the Magpie Goose), and the Anatidae, which includes more than 140 species of waterfowl.
Case	Any individual animal infected by HPAI virus, with or without clinical signs.
Charadriiformes	A diverse order of small to medium-large birds including those commonly known as shorebirds. There are about 350 species in all parts of the world. Most live near water and eat invertebrates or other small animals.
Compartment (compartmentalization)	An animal subpopulation contained in one or more establishments under a common biosecurity and husbandry management system with a distinct health status in respect to a specific disease or specific diseases for which strict surveillance, documentation, control, and biosecurity measures have been applied for the purpose of international trade.
Control Area	A Control Area (an Infected Zone and Buffer Zone) has individual premises quarantine for Infected Premises, Suspect Premises, and Contact Premises and movement restrictions for At-Risk Premises and Monitored Premises.
Domestic poultry	See poultry.
Emergency vaccination	A disease control strategy using the immunization of susceptible animals through the administration of a vaccine comprising antigens appropriate to the disease to be controlled.
Etiology	The causes or origin of disease, or the factors that produce or predispose toward a certain disease or disorder.
Euthanasia	The humane destruction of an animal accomplished by a method that produces rapid unconsciousness and subsequent death with a minimum of pain or distress or a method that utilizes anesthesia produced by an agent that causes painless loss of consciousness and subsequent death.

FAD PReP (Foreign Animal Disease Preparedness and Response Plan)	Documents used to identify overall strategies, veterinary functions, organization, and countermeasures necessary to contain and control an FAD outbreak. It is also used to integrate functions and countermeasures with emergency management systems and operations conducted in joint and unified command by Federal, State, Tribal, and local personnel.
Fomites	Inanimate objects that can transmit infectious agents from one animal or person to another.
Foreign animal disease	A transboundary animal disease not known to exist in the U.S. animal population.
Galliformes	An order of birds containing turkeys, grouse, chickens, quails, and pheasants. Common names are gamefowl or gamebirds, landfowl, gallinaceous birds, or galliformes.
Highly pathogenic avian influenza (HPAI) (9 U.S. CFR 53)	<ul style="list-style-type: none"> (1) “Any influenza virus that kills at least 75 percent of eight 4- to 6-week-old susceptible chickens within 10 days following intravenous inoculation with 0.2ml of a 1:10 dilution of a bacteria-free, infectious allantoic fluid; (2) Any H5 or H7 virus that does not meet the criteria in paragraph (1) of this definition, but has an amino acid sequence at the hemagglutinin cleavage site that is compatible with highly pathogenic avian influenza viruses; or (3) Any influenza virus that is not an H5 or H7 subtype that kills one to five chickens and grows in cell culture in the absence of trypsin.”
Highly pathogenic avian influenza (HPAI) (OIE)	“High pathogenicity avian influenza viruses have an IVPI [intravenous pathogenicity index] in six-week-old chickens greater than 1.2, or as an alternative, cause at least 75 percent mortality in four- to eight-week-old chickens infected intravenously. H5 and H7 viruses which do not have an IVPI of greater than 1.2 or cause less than 75 percent mortality in an intravenous lethality test should be sequenced to determine whether multiple basic amino acids are present at the cleavage site of the haemagglutinin molecule (HA0); if the amino acid motif is similar to that observed for other HPAI isolates, the isolate being tested should be considered as high pathogenicity avian influenza virus.”

Incident Command System	<p>A standardized, on-scene, all-hazards incident management approach that</p> <ul style="list-style-type: none"> ◆ allows for the integration of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure; ◆ enables a coordinated response among various jurisdictions and functional agencies, both public and private; and ◆ establishes common processes for planning and managing resources.
Incubation period (OIE)	For the purposes of the OIE <i>Terrestrial Code (2015)</i> the incubation period for AI shall be 21 days. The incubation period is the longest period which elapses between the introduction of the pathogen into the animal and the occurrence of the first clinical signs of the disease.
Index case	The first or original case identified in a disease outbreak.
Low pathogenicity avian influenza (LPAI) (OIE)	All influenza A viruses of H5 and H7 subtype that are not HPAI viruses.
Mass depopulation	Method by which large numbers of animals must be destroyed quickly and efficiently with as much consideration given to the welfare of the animals as practicable, but where the circumstances and tasks facing those doing the depopulation are understood to be extenuating.
Mutation (genetic)	Change in the sequence of a cell's genome caused by radiation, viruses, transposons, and mutagenic chemicals, as well as errors that occur during meiosis or replication.
National Animal Health Laboratory Network (NAHLN)	NAHLN is a cooperative effort between two U.S. Department of Agriculture agencies and the American Association of Veterinary Laboratory Diagnosticians. It is a national network of State and University laboratories, which use common testing methods and software platforms to perform diagnostics and share information.
Non-susceptible animal	Animal that does not develop a particular disease when exposed to the causative infectious agent of that disease.
OIE (World Organization for Animal Health)	Organization that collects and publishes information on animal diseases from 180 (August 2015) countries and develops standards for animal health.
Outbreak	The occurrence of cases of a disease that are in excess of what is normally expected in a given population.

Poultry	Chickens, and any of the following birds, if these other birds are kept, raised, captured, bred, or otherwise used for a commercial purpose: turkeys, ducks, geese, swans, pheasants, partridges, grouse, quail, guinea fowl, pea fowl, pigeons, doves, ostriches, emus, rheas, cassowaries. Commercial purposes include the production or sale of birds, or of their meat, eggs, or feathers. Does not include chickens or other birds displayed in a licensed exhibition or zoo.
Personal protective equipment (PPE)	Clothing and equipment to prevent occupational injuries and diseases through control of exposure to potential hazards in the work place after engineering and administrative controls have been implemented to the fullest extent.
Preemptive depopulation	Depopulation under the competent authority of susceptible animal species in herds or flocks on premises that have been exposed to infection by direct animal-to-animal contact or by indirect contact of a kind likely to result in the transmission of HPAI virus prior to the expression of clinical signs.
Premises	A geographically and epidemiologically defined location, including a ranch, farm, stable, or other establishment.
Reassortment (genetic)	The mixing of the genetic material of a species into new combinations in different individuals. In particular, reassortment occurs among influenza viruses, whose genomes consist of eight distinct segments of RNA. These segments act like mini-chromosomes, and each time a flu virus is assembled, it requires one copy of each segment.
Regionalization (also known as zoning)	An animal subpopulation defined primarily on a geographical basis (using natural, artificial, or legal boundaries).
Slaughter	The killing of an animal or animals for food.
Stamping-out (OIE)	Means a policy designed to eliminate an outbreak by carrying out under the authority of the Veterinary Authority the following: a) the killing of the animals which are affected and those suspected of being affected in the herd and, where appropriate, those in other herds which have been exposed to infection by direct animal to animal contact, or by indirect contact with the causal pathogen; this includes all susceptible animals, vaccinated or unvaccinated, on infected establishments; animals should be killed in accordance with Chapter 7.6; the destruction of their carcasses by rendering, burning or burial, or by any other method described in Chapter 4.12; and the cleansing and disinfection of establishments through procedures defined in Chapter 4.13.
Susceptible animal	Any animal that can be infected with and replicate the disease pathogen of concern. The susceptible animals of primary concern to this plan are poultry.

Susceptible species	See susceptible animal.
Trace back	The identification of the origin and movements of all animals, animal products, possible fomites, people, possible vectors, and so on that have entered onto an infected premises.
Trace forward	The tracing of all animals, people, fomites, and so on that have left an infected premises. The premises that received the animals or goods should be investigated and kept under surveillance or quarantine.
Vector	An insect or any living carrier that transports an infectious agent from an infected individual to a susceptible individual or its food or immediate surroundings.
Wild birds	Migratory game birds, upland game birds, and all undomesticated feathered vertebrates.
Zoonotic	Any disease or infection that is naturally transmissible from animals to humans.

Appendix K

Abbreviations

3D	depopulation, decontamination, and disposal
AC	Area Command
ADD	Assistant District Director
ADSM	Animal Disease Spread Model
AEOC	APHIS Emergency Operations Center
AGID	agar-gel immunodiffusion
AHPA	Animal Health Protection Act
AI	avian influenza
AMT	APHIS Management Team
APHIS	Animal and Plant Health Inspection Service
APHIS WS	Animal and Plant Health Inspection Service Wildlife Services
ARP	At-Risk Premises
AVMA	American Veterinary Medical Association
AZA	American Zoological Association
BZ	Buffer Zone
CA	Control Area
CCC	Commodity Credit Corporation
CDC	Centers for Disease Control and Prevention
CEAH	Centers for Epidemiology and Animal Health
CF	Contingency Fund
CFIA	Canadian Food Inspection Agency
CFR	Code of Federal Regulations
CFSPH	Center for Food Security and Public Health
CP	Contact Premises
CVO	Chief Veterinary Officer of the United States (VS DA)
CVZ	Containment Vaccination Zone
DA	Deputy Administrator
DF	disease freedom

DHS	Department of Homeland Security
DIVA	differentiation of infected from vaccinated animals
DOI	Department of Interior
EDI	emerging disease incidents
ELISA	enzyme-linked immunosorbent assay
EMRS	Emergency Management Response System
EPA	Environmental Protection Agency
ERS	Economic Research Service
ESF	Emergency Support Function
FA	Free Area
FAD	foreign animal disease
FAD PReP	Foreign Animal Disease Preparedness and Response Plan
FADDL	Foreign Animal Disease Diagnostic Laboratory (Plum Island, NY)
FAO	UN Food and Agriculture Organization
FEMA	Federal Emergency Management Agency
FFS	Federal-to-Federal support
fluA	influenza A virus
FP	Free Premises
GPS	global positioning system
H or HA	hemagglutinin
HHS	Department of Health and Human Services
HI	hemagglutination inhibition
HPAI	highly pathogenic avian influenza
HVT	turkey herpesvirus
IC	Incident Command
ICG	Incident Coordination Group
ICP	Incident Command Post
ICS	Incident Command System
IMT	Incident Management Team
IP	Infected Premises
IVPI	intravenous pathogenicity index
IZ	Infected Zone

JIC	Joint Information Center
LBMS	Live Bird Marketing System
LPA	Legislative and Public Affairs
LPAI	low pathogenic avian influenza
MAC	Multiagency Coordination Group
MP	Monitored Premises
N or NA	neuraminidase
NAHEMS	National Animal Health Emergency Management System
NAHERC	National Animal Health Emergency Response Corps
NAHLN	National Animal Health Laboratory Network
NASAHO	National Association of State Animal Health Officials
NASDA	National Association of State Departments of Agriculture
NI	neuraminidase inhibition
NIES	National Import Export Services
NIMS	National Incident Management System
NPIC	National Preparedness and Incident Coordination
NPIP	National Poultry Improvement Plan
NRF	National Response Framework
NVS	National Veterinary Stockpile
NVSL	National Veterinary Services Laboratories
NVSL-Ames	National Veterinary Services Laboratories-Ames, IA
NVSL-FADDL	National Veterinary Services Laboratories-Foreign Animal Disease Diagnostic Laboratory Plum Island, NY
OIE	World Organization for Animal Health
PCR	polymerase chain reaction
PMV-1	Paramyxovirus
PPE	personal protective equipment
PVZ	Protection Vaccination Zone
RNA	ribonucleic acid
ROSS	Resource Ordering and Status System
rRT-PCR	real-time reverse transcriptase polymerase chain reaction
SAHO	State Animal Health Official
SES	Secure Egg Supply

SITC	Smuggling Interdiction and Trade Compliance
SOP	standard operating procedure
SP	Suspect Premises
SPRS	Surveillance, Preparedness, and Response Services
STAS	Science, Technology, and Analysis Services
SZ	Surveillance Zone
USDA	U.S. Department of Agriculture
VDACS	Virginia Department of Agriculture and Consumer Services
VI	virus isolation
VP	Vaccinated Premises
VS	Veterinary Services
VSET	VS Executive Team
VZ	Vaccination Zone
WHO	World Health Organization

Appendix L

Selected References and Resources

Note: all related FAD PReP documents listed in [Appendix A](#) are also references to this APHIS-USDA *HPAI Response Plan: The Red Book*.

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