



# **HIGHLY PATHOGENIC AVIAN INFLUENZA RESPONSE PLAN**

***THE RED BOOK***

## **FAD PReP**

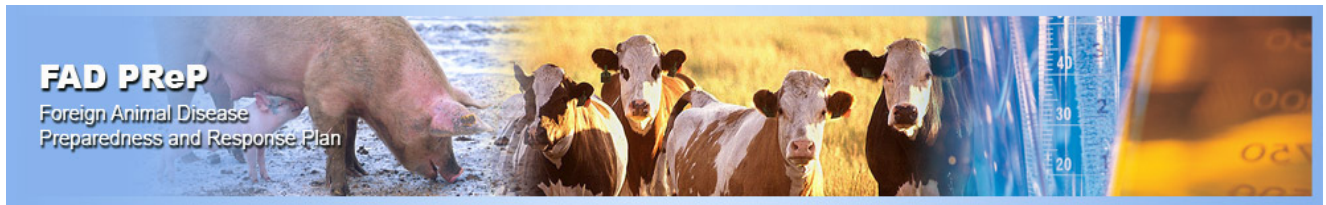
**Foreign Animal Disease  
Preparedness & Response Plan**

**National Center for Animal  
Health Emergency Management**



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

SEPTEMBER 2012



September 20, 2012  
USDA APHIS, Veterinary Services  
National Center for Animal Health Emergency Management  
Preparedness and Incident Coordination Staff

This version of the *USDA APHIS HPAI Response Plan: The Red Book (September 2012)* has been updated according to comments received and revisions to current Foreign Animal Disease Preparedness and Response Plan (FAD PReP) materials that are referenced here. The following list summarizes the important changes that were made in 2012.

- Revision of Chapter 3, Appendix A, and Appendix B to reflect changes in the APHIS Foreign Animal Disease Framework documents.
- Corrections and clarifications made in response to comments throughout the plan.
- Updates according to the 2012 OIE *Terrestrial Animal Health Code*.

The previously revised version of the *HPAI Response Plan (2011)* was updated to reflect the comments made on the August 2010 version of the plan. While much of the document remained the same, there were important changes both in substance and organization. The bulleted list below summarizes the key changes that were made in 2011.

- Revision of diagnostics section, with additional information.
- Clarification of intent and purpose of this document.
- Development of new movement control tables.
- Revision of template for an epidemiological questionnaire.
- Reorganization of chapter on goals and strategy for HPAI response.
- Corrections and clarifications made in response to comments throughout the plan.

This plan will continue to be reviewed as needed. We realize that preparing for and responding to an HPAI outbreak will be a complex effort, requiring collaboration for multiple stakeholders. As such, we will continue to accept comments on the *HPAI Response Plan* for incorporation into future versions.



*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:

<https://fadprep.lmi.org> (request access) or

[http://www.aphis.usda.gov/animal\\_health/emergency\\_management](http://www.aphis.usda.gov/animal_health/emergency_management)

<http://inside.aphis.usda.gov/vs/em/fadprep.shtml> (APHIS employees)

or e-mail [FAD.PReP.Comments@aphis.usda.gov](mailto:FAD.PReP.Comments@aphis.usda.gov)

# Executive Summary

---

This *Highly Pathogenic Avian Influenza (HPAI) Response Plan: The Red Book (2012)* incorporates comments received on the *HPAI Response Plan: The Red Book (2010)* and *HPAI Response Plan: The Red Book (2011)* and updates to current Foreign Animal Disease Preparedness and Response (FAD PRoP) materials. 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, promotes agricultural security, secures the food supply, and guards animal health by providing strategic guidance on responding to an HPAI outbreak. Developed by the National Center for Animal Health Emergency Management of the Animal and Plant Health Inspection Service (APHIS), the plan gives direction to emergency responders at the local, State, Tribal, and Federal 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. Since the World Health Organization began recording the incidence of AI in 2003, there have been 608 cases of avian influenza infection in humans and 359 deaths. Animal health officials will coordinate with public health officials in the event that HPAI is identified in the United States.

HPAI virus causes extremely high morbidity and mortality rates in poultry, and is highly contagious. Currently, there is no evidence that HPAI exists in the United States in domestic poultry. HPAI subtype H5N1 does exist in much of Asia and in parts of Europe and Africa. 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 could have a major economic impact. In addition to the potential public health threat, there may also be a significant social and psychological impact on flock owners.

*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 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. They will also allow the United States to regain disease-free status without the response effort causing more disruption and damage than the disease outbreak itself.*

During an HPAI outbreak response effort, many activities—such as epidemiology, surveillance, biosecurity, quarantine and movement control, and depopulation—must occur in a deliberate, coordinated fashion. 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.

*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.”*

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 could 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 the APHIS Incident Management Structure;
- ◆ presents 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.

Public health information about avian influenza and humans can be found at <http://www.cdc.gov/flu/avianflu>.

Please visit the FAD PReP collaboration website, which promotes preparedness relationships and advances response capabilities. The website is at: <https://fadprep.lmi.org>.

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. Send them to the following e-mail address: [FAD.PReP.Comments@aphis.usda.gov](mailto:FAD.PReP.Comments@aphis.usda.gov).

# Contents

---

Preface .....	xii
Chapter 1 Introduction and HPAI Information .....	1-1
1.1 INTRODUCTION TO RESPONSE PLAN.....	1-1
1.2 PURPOSE OF DOCUMENT .....	1-2
1.3 AUDIENCE .....	1-3
1.4 HPAI INFORMATION .....	1-3
1.4.1 Etiology.....	1-3
1.4.2 History and Global Distribution .....	1-5
1.4.3 HPAI in the United States.....	1-5
1.4.4 International Trade .....	1-6
1.4.5 Impact of an HPAI Outbreak.....	1-6
1.4.6 Ecology.....	1-7
1.4.7 Diagnosis in Avian Species .....	1-8
1.4.8 Immunity.....	1-10
Chapter 2 Framework for HPAI Preparedness and Response.....	2-1
2.1 NATIONAL RESPONSE FRAMEWORK, NATIONAL INCIDENT MANAGEMENT SYSTEM, AND NATIONAL ANIMAL HEALTH EMERGENCY MANAGEMENT SYSTEM INTEGRATION.....	2-1
2.1.1 National Response Framework .....	2-1
2.1.2 National Incident Management System.....	2-1
2.1.3 National Animal Health Emergency Management System .....	2-2
2.1.4 Coordination and Collaboration .....	2-3
2.2 FEDERAL ROLES, RESPONSIBILITIES, AND PLANNING ASSUMPTIONS .....	2-3
2.2.1 Overview .....	2-3
2.2.2 USDA Roles and Responsibilities Overview.....	2-3
2.3 AUTHORITY .....	2-4
Chapter 3 USDA HPAI Preparedness and Response.....	3-1
3.1 USDA .....	3-1
3.1.1 Preparedness Exercises.....	3-1

3.1.2	Domestic Activities .....	3-2
3.1.3	International Activities.....	3-3
3.1.4	International Trade .....	3-3
3.1.5	Compartmentalization.....	3-4
3.2	USDA ORGANIZATIONAL STRATEGY .....	3-5
3.3	APHIS INCIDENT MANAGEMENT STRUCTURE.....	3-5
3.3.1	Multiagency Coordination Group .....	3-6
3.3.2	APHIS Incident Coordination Group .....	3-7
3.3.3	Organization for a Single Incident.....	3-7
3.3.4	Organization for Multiple Incidents .....	3-7
3.3.5	Guidance on Incident Management and Organizational Strategy .....	3-8
3.4	APHIS INCIDENT MANAGEMENT LEVELS .....	3-8
3.5	NATIONAL ANIMAL HEALTH EMERGENCY RESPONSE CORPS (NAHERC).....	3-10
3.6	DIAGNOSTIC RESOURCES AND LABORATORY SUPPORT .....	3-10
3.6.1	National Veterinary Services Laboratories .....	3-10
3.6.2	National Animal Health Laboratory Network.....	3-10
3.6.3	Center for Veterinary Biologics.....	3-11
<b>Chapter 4 HPAI Outbreak Response Goals and Strategy.....</b>		<b>4-1</b>
4.1	RESPONSE GOALS.....	4-1
4.2	PRINCIPLES, CRITICAL ACTIVITIES, AND TOOLS FOR AN HPAI RESPONSE.....	4-2
4.2.1	Critical Activities .....	4-2
4.2.2	Epidemiological Principles.....	4-2
4.2.3	Coordinated Public Awareness Campaign .....	4-3
4.2.4	Timeline in any HPAI Response for First 72 Hours .....	4-3
4.3	RESPONSE STRATEGY FOR CONTROL AND ERADICATION OF HPAI IN POULTRY ...	4-4
4.3.1	Defining Stamping-Out as a Response Strategy for Poultry.....	4-4
4.3.2	Zones and Areas in Relation to Stamping-Out .....	4-5
4.3.3	Control and Eradication Strategy for Other Animals .....	4-5
4.3.4	Assessing a Possible Outbreak.....	4-6
4.3.5	Authorization for Response and Associated Activities.....	4-7
4.3.6	Management of Incident.....	4-7
4.4	FACTORS INFLUENCING RESPONSE .....	4-7

---

4.5	INTERNATIONAL STANDARDS FOR AI.....	4-8
4.5.1	OIE Standards for HPAI Response .....	4-8
4.5.2	Recognition of Disease-Free Status .....	4-9
4.5.3	Criteria Needed for AI-Free Status .....	4-9
Chapter 5 Specific HPAI Response Critical Activities and Tools .....		5-1
5.1	ETIOLOGY AND ECOLOGY .....	5-1
5.2	LABORATORY DEFINITIONS AND CASE DEFINITIONS .....	5-1
5.2.1	Laboratory Definitions.....	5-1
5.2.2	Case Definitions .....	5-3
5.2.3	Case Definition Development Process .....	5-5
5.3	SURVEILLANCE .....	5-5
5.3.1	Surveillance Planning for HPAI Outbreak.....	5-6
5.3.2	Surveillance Sampling .....	5-8
5.3.3	Surveillance Schemes Based on Zone.....	5-9
5.4	DIAGNOSTICS .....	5-10
5.4.1	Sample Collection and Diagnostic Testing .....	5-10
5.4.2	Surge Capacity .....	5-12
5.4.3	Reporting .....	5-13
5.5	EPIDEMIOLOGICAL INVESTIGATION AND TRACING .....	5-13
5.5.1	Summary of Zones, Areas, and Premises Designations .....	5-13
5.5.2	Epidemiological Investigation .....	5-15
5.5.3	Tracing .....	5-16
5.5.4	Considerations for Size of Control Area and Minimum Sizes of Other Zones .....	5-16
5.6	INFORMATION MANAGEMENT .....	5-18
5.7	COMMUNICATION .....	5-19
5.7.1	Objectives.....	5-19
5.7.2	Key Messages .....	5-20
5.7.3	Further Communications Guidance .....	5-20
5.8	HEALTH AND SAFETY AND PERSONAL PROTECTIVE EQUIPMENT .....	5-20
5.8.1	Mental Health Concerns .....	5-21
5.8.2	Further Information on Health, Safety, and Personal Protective Equipment .....	5-22



5.9	BIOSECURITY .....	5-22
5.9.1	Biosecurity Hazards and Mitigating Measures.....	5-23
5.9.2	Closed Flocks.....	5-23
5.9.3	Waiting Period .....	5-24
5.10	QUARANTINE AND MOVEMENT CONTROL .....	5-24
5.10.1	Zones, Areas, and Premises Designations.....	5-25
5.10.2	Movement Guidance into, within, and out of a Control Area.....	5-25
5.10.3	OIE Treatment Guidelines for HPAI.....	5-30
5.10.4	Surveillance Required for Poultry and Product Movement .....	5-31
5.11	CONTINUITY OF BUSINESS .....	5-31
5.12	REGIONALIZATION FOR INTERNATIONAL TRADE (FOR A U.S. HPAI RESPONSE)..	5-32
5.12.1	Compartmentalization.....	5-32
5.12.2	Further Guidance.....	5-32
5.13	MASS DEPOPULATION AND EUTHANASIA .....	5-33
5.13.1	Best Practice Guidance .....	5-33
5.13.2	Water-Based Foam for Poultry Depopulation .....	5-34
5.14	DISPOSAL .....	5-34
5.15	CLEANING AND DISINFECTION .....	5-35
5.16	VACCINATION .....	5-36
5.16.1	Emergency Vaccination Strategies for Poultry .....	5-36
5.16.2	Differentiation of Infected and Vaccinated Animals and Surveillance of Vaccinated Flocks .....	5-36
5.16.3	Assessment and Overview .....	5-37
5.16.4	Strategic Vaccine Distribution.....	5-39
5.16.5	Vaccination Zone Designations .....	5-39
5.16.6	Vaccinated Premises.....	5-41
5.16.7	Movement Restrictions for Vaccinates .....	5-42
5.16.8	Cessation of Vaccination .....	5-42
5.17	NATIONAL VETERINARY STOCKPILE.....	5-42
5.18	WILDLIFE MANAGEMENT AND VECTOR CONTROL.....	5-43
5.18.1	Wildlife Management .....	5-43
5.18.2	Vector Control .....	5-44
5.19	ANIMAL WELFARE .....	5-44

---

5.20	MODELING AND ASSESSMENT TOOLS .....	5-44
5.21	APPRAISAL AND COMPENSATION.....	5-45
5.22	FINANCE .....	5-46
5.23	NATIONAL RESPONSE FRAMEWORK AND NATIONAL INCIDENT MANAGEMENT SYSTEM.....	5-47
Chapter 6 Recovery after an HPAI Outbreak .....		6-1
6.1	PROOF-OF-FREEDOM.....	6-1
6.1.1	Recognition of Disease-Free Status .....	6-1
6.1.2	Surveillance for Recognition of Disease Freedom.....	6-2
6.1.3	Release of Control Area Restrictions.....	6-3
6.1.4	Disposition of Vaccinates .....	6-4
6.1.5	Country Freedom Declaration .....	6-4
6.2	REPOPULATION .....	6-4
6.2.1	Restocking Guidance .....	6-4
6.2.2	Testing Requirements for Restocking.....	6-4
6.2.3	Approved Sources of Poultry.....	6-5
Appendix A FAD PReP Materials to Support HPAI Response		
Appendix B Incident Management		
Appendix C Laboratory Network List for AI		
Appendix D Overview of the Secure Egg Supply Plan		
Appendix E Updated HPAI Outbreak Surveillance Guidance and Rationale for Poultry		
Appendix F Procedures for HPAI Investigation and Specimen Submission		
Appendix G Epidemiological Investigation Questionnaire		
Appendix H Examples of Movement Control Notices		
Appendix I Available AI Vaccines		
Appendix J Glossary		
Appendix K Abbreviations		
Appendix L Selected References and Resources		

## Figures

Figure 3-1. APHIS Multiagency Coordination Structures and APHIS Emergency Operations Center: Relationship to Incident Management Team (Assuming a Single Incident).....	3-6
Figure 3-2. APHIS Multiagency Coordination Structures and APHIS Emergency Operations Center: Relationship to Multiple Incident Management Team Structures (Assuming Multiple Incidents and a Unified Area Command) .....	3-8
Figure 3-3. Incident Management Levels.....	3-9
Figure 4-1. Critical Activities in the First 72 Hours of U.S. HPAI Response .....	4-4
Figure 4-2. Example of Zones and Areas in Relation to Stamping-Out (Infected Premises would be Depopulated).....	4-5
Figure 5-1. Diagnostic Flow for FAD Investigations for HPAI.....	5-12
Figure 5-2. Example of Zones, Areas, and Premises in HPAI Outbreak Response.....	5-15
Figure 5-3. Premises Designations in Relation to Permitting and Movement Control.....	5-29
Figure 5-4. Decision Tree for Emergency Vaccination in Domestic Poultry .....	5-38
Figure 5-5. Examples of Containment Vaccination Zones .....	5-40
Figure 5-6. Examples of Protection Vaccination Zones .....	5-41
Figure 5-7. Examples of Vaccinated Premises .....	5-42

## Tables

Table 5-1. Summary of Premises Designations.....	5-14
Table 5-2. Summary of Zone and Area Designations .....	5-14
Table 5-3. Minimum Sizes of Areas and Zones .....	5-17
Table 5-4. Factors To Consider in Determining Control Area Size for HPAI.....	5-17
Table 5-5. Movement into Control Area from Outside Control Area to Specific Premises.....	5-26
Table 5-6. Movement within a Control Area.....	5-27
Table 5-7. Movement from Inside a Control Area to Outside a Control Area from Specific Premises .....	5-28
Table 5-8. Inactivation of AI in Eggs and Egg Products .....	5-30
Table 5-9. Inactivation of AI in Meat.....	5-31

# Preface

---

The Foreign Animal Disease Preparedness and Response Plan (FAD PReP)—*Highly Pathogenic Avian Influenza (HPAI) Response Plan: The Red Book (2012)* provides strategic guidance for responding to an animal health emergency caused by HPAI in the United States. This *HPAI Response Plan (2012)* updates the *HPAI Response Plan (2011)* and replaces previous HPAI summary response plans. Information in this plan may require further discussion and development with stakeholders.

This *HPAI Response Plan* was last updated in **September 2012**. Please send questions or comments to:

National Center for Animal Health Emergency Management  
Veterinary Services  
Animal and Plant Health Inspection Service  
U.S. Department of Agriculture  
4700 River Road, Unit 41  
Riverdale, MD 20737-1231  
Telephone: (301) 851-3595  
Fax: (301) 734-7817  
E-mail: [FAD.PReP.Comments@aphis.usda.gov](mailto:FAD.PReP.Comments@aphis.usda.gov)

While best efforts have been used in developing and preparing the *HPAI Response Plan*, the U.S. Government, U.S. Department of Agriculture, and the Animal and Plant Health Inspection Service and other parties, such as employees and contractors contributing to this document, neither warrant nor assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information or procedure disclosed. The primary purpose of this *HPAI Response Plan* is to provide strategic guidance to those government officials responding to an HPAI outbreak. It is only posted for public access as a reference.

The *HPAI Response Plan* may refer to links to various other Federal and State agencies and private organizations. These links are maintained solely for the user's information and convenience. If you link to such site, please be aware that you are then subject to the policies of that site. In addition, please note that U.S. Department of Agriculture does not control and cannot guarantee the relevance, timeliness, or accuracy of these outside materials. Further, the inclusion of links or pointers to particular items in hypertext is not intended to reflect their importance, nor is it intended to constitute approval or endorsement of any views expressed, or products or services offered, on these outside websites, or the organizations sponsoring the websites.

Trade names are used solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of the product by USDA or an endorsement over other products not mentioned.

USDA prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and telecommunications device for the deaf [TDD]).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

# Chapter 1

## Introduction and HPAI Information

---

### 1.1 INTRODUCTION TO RESPONSE PLAN

This *Highly Pathogenic Avian Influenza (HPAI) Response Plan: The Red Book (2012)* incorporates comments received on the *HPAI Response Plan (2011)* and the *HPAI Response Plan (2010)* and updates to current Foreign Animal Disease Preparedness and Response (FAD PReP) materials. The objectives of this plan are to identify the (1) capabilities needed to respond to an HPAI outbreak and (2) critical activities that are involved in responding to that outbreak and time-frames. These critical activities are the responsibility of Incident Command (IC) in an outbreak situation.

To achieve these objectives, this plan provides current information on HPAI and its relevance to the United States, and presents 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 updated guidance on 23 critical response activities and tools, such as disposal, appraisal and compensation, and quarantine and movement control. As indicated by links throughout the document, this plan is integrated and coordinated with other new and forthcoming FAD PReP documents such as HPAI standard operating procedures (SOPs), National Animal Health Emergency Management System (NAHEMS) Guidelines, and existing Animal and Plant Health Inspection Service (APHIS) memoranda. ([Appendix A](#) provides a list of documents related to HPAI outbreak response and an overview of FAD PReP.)

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 HPAI response. In particular, States should develop response plans focused on the specific characteristics of the State and its poultry industry.

Avian influenza (AI) is primarily an infection of birds. While other species are susceptible (for a list see [Subsection 1.4.6](#) of this plan), this plan is focused on poultry.<sup>1</sup> However, if susceptible animals other than poultry become significant to

---

<sup>1</sup> 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.

---

the response effort, the case and laboratory definitions will be adapted by the IC to fit the prevailing epidemiological findings during an outbreak.

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 associated with morbidity and mortality rates of up to 100 percent. HPAI is a high-priority concern for U.S. Department of Agriculture (USDA) APHIS.

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. Despite the fact that HPAI viruses have not established endemic infection status in the poultry population of countries that have developed veterinary infrastructure, the potential conversion of LPAI to HPAI through antigenic shift or antigenic drift is a critical threat to animal health in such countries, including the United States.

The H5N1 subtype of HPAI is also worth acknowledging as a specific concern to not only animal health, but also public health in the United States. HPAI H5N1 is found in much of Asia and in parts of Europe and Africa. This subtype of HPAI is particularly virulent, resulting in high mortality in poultry and in some species of wild birds. Although it appears to have a relatively high species-specific transmission barrier, HPAI H5N1 has been demonstrated to infect and be fatal to humans. Current evidence suggests that very close contact with dead or sick birds infected with HPAI H5N1 is the primary source of HPAI H5N1 infection in humans.<sup>2</sup> Therefore, it is critically important for agriculture and public health agencies to coordinate efforts in any response to HPAI.

## 1.2 PURPOSE OF DOCUMENT

This plan provides strategic guidance for USDA APHIS and responders at all levels in the event of an HPAI outbreak, specifically in poultry. 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.

The plan does not address control and eradication of LPAI in poultry. However, LPAI is addressed comprehensively in the USDA-APHIS *National Poultry Improvement Plan (NPIP)*:

[http://www.aphis.usda.gov/animal\\_health/animal\\_dis\\_spec/poultry/](http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/).

---

<sup>2</sup> Writing Committee of the World Health Organization (WHO) Consultation on Human Influenza A/H5. 2005. "Avian Influenza A (H5N1) Infection in Humans." *The New England Journal of Medicine*. 353: 1374-85.

## 1.3 AUDIENCE

This document is intended for animal health emergency responders at all levels of government, as well as industry partners. It provides strategic guidance and offers additional resources for more tactical information for responders and other individuals who will act during an HPAI outbreak in poultry.

## 1.4 HPAI INFORMATION

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

- ◆ Etiology
- ◆ History and global distribution
- ◆ Impact of an HPAI outbreak
- ◆ Ecology
- ◆ Diagnosis
- ◆ Immunity.

The USDA AI website also contains valuable information: [www.usda.gov/birdflu](http://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 notifiable avian influenza (NAI), with additional information on highly pathogenic notifiable avian influenza (HPNAI), and low pathogenic notifiable avian influenza (LPNAI).

### 1.4.1 Etiology

#### 1.4.1.1 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.



---

#### 1.4.1.2 WORLD ORGANIZATION FOR ANIMAL HEALTH (OIE) DEFINITION OF NAI<sup>3</sup>

The OIE defines NAI as:

...an infection of poultry caused by any influenza A virus of the H5 or H7 subtypes or by any AI virus with an intravenous pathogenicity index (IVPI) greater than 1.2 (or as an alternative at least 75 percent mortality) as described below. NAI viruses can be divided into highly pathogenic notifiable avian influenza (HPNAI) and low pathogenicity notifiable avian influenza (LPNAI):

- a. HPNAI viruses have an IVPI 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 HPNAI isolates, the isolate being tested should be considered as HPNAI;
- b. LPNAI are all influenza A viruses of H5 and H7 subtype that are not HPNAI viruses.

#### 1.4.1.3 U.S. CODE OF FEDERAL REGULATIONS (CFR) DEFINITIONS OF AI<sup>4</sup>

In 9 CFR 56, H5/H7 LPAI is defined as:

An infection of poultry caused by influenza A virus of H5 or H7 subtype that has an intravenous pathogenicity index test in 6-week-old chickens less than 1.2 or any infection with influenza A viruses of H5 or H7 subtype for which nucleotide sequencing has not demonstrated the presence of multiple basic amino acids at the cleavage site of the hemagglutinin.

---

<sup>3</sup> 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.” Additionally, “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.”

<sup>4</sup> Please see the appropriate CFR sections for further information, such as CFR definitions of poultry.

In 9 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, 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 and that kills one to five chickens and grows in cell culture in the absence of trypsin.

## 1.4.2 History and Global Distribution

AI was first reported and described as a serious disease of poultry in Italy in 1878. A type A influenza 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 the domestic and wild avian species, locality of poultry production, migratory routes, and season. Accurate prevalence rates of infection are difficult to determine—particularly for LPAI—because international surveillance systems and procedures used to identify and track AI vary widely.

Sporadic and infrequent outbreaks of HPAI in domestic poultry occur worldwide, and outbreaks have been documented before 2000 in Australia, Canada, Germany, Ireland, Italy, Mexico, the Netherlands, Pakistan, South Africa, the United Kingdom, and the United States. Since 2000, HPAI has broken out in Italy (H7N1), Canada (H7N3), Chile (H7N3), the Netherlands/Germany/Belgium (H7N7), North Korea (H7N7), Pakistan (H7N3), South Africa (H5N2), and the United States (H5N2), and HPAI H5N1 has appeared in a number of Asian, European, and African countries. In 2009, HPAI H5N1 in poultry was reported to the OIE in a number of countries, including China, Bangladesh, India, Indonesia, Vietnam, and Egypt. Egypt, Cambodia, Indonesia, Vietnam, and China also confirmed human cases of HPAI H5N1 in 2009 and 2010. In 2010 and 2011, HPAI outbreaks in poultry have been reported in countries including Bangladesh, Bhutan, India, Indonesia, Israel, Japan, Romania, Mongolia, Myanmar, South Korea, and Vietnam. Since the start of 2012 continuing outbreaks have been reported in Bangladesh, Bhutan, China, Hong Kong, India, South Africa, Mexico, and Vietnam. Outbreaks that have been resolved occurred in Chinese Taipei, Iran, Israel, Myanmar, and Nepal. HPAI is considered endemic in Egypt and Indonesia.

---

### 1.4.3 HPAI in the United States

LPAI viruses are present in wild birds and are periodically detected in domestic poultry flocks in the United States. Currently, HPAI does not exist in the domestic poultry population in the United States. However, the United States experienced HPAI outbreaks in 1924, 1983, and 2004. Each of those outbreaks was linked to the live bird marketing system (LBMS) via epidemiological investigation. No significant human illness was reported.

### 1.4.4 International Trade

The United States does not import live poultry from countries or regions currently experiencing HPAI outbreaks in commercial or traditionally raised 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: [http://www.aphis.usda.gov/import\\_export/animals/animal\\_import/animal\\_imports\\_hpai.shtml](http://www.aphis.usda.gov/import_export/animals/animal_import/animal_imports_hpai.shtml).

### 1.4.5 Impact of an HPAI Outbreak

#### 1.4.5.1 ECONOMIC

The 1983–84 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.<sup>5</sup> The 2004 outbreak of H7N3 in Canada resulted in C\$360 million in gross economic losses.<sup>6</sup> An HPAI outbreak today in the United States today could exceed these economic costs.

#### 1.4.5.2 ZOONOTIC POTENTIAL AND PUBLIC HEALTH IMPLICATIONS

HPAI may have significant public health implications. HPAI is zoonotic, and although it appears to have a relatively high species-specific transmission barrier, under certain circumstances HPAI H5N1 has been demonstrated to infect and be fatal to humans. As of August 10, 2012, there have been 608 cases and 359 deaths of laboratory-confirmed HPAI H5N1 reported to the World Health Organization (WHO).<sup>7</sup> The HPAI H7N7 virus has also infected humans. However, in total, less

---

<sup>5</sup> APHIS, *Highly Pathogenic Avian Influenza: A Threat to U.S. Poultry*, [http://www.aphis.usda.gov/publications/animal\\_health/content/printable\\_version/pub\\_ahhpa1.pdf](http://www.aphis.usda.gov/publications/animal_health/content/printable_version/pub_ahhpa1.pdf).

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

<sup>7</sup> WHO, *Cumulative Number of Confirmed Cases of Avian Influenza A/(H5N1) Reported to WHO*, 2012. [http://www.who.int/influenza/human\\_animal\\_interface/H5N1\\_cumulative\\_table\\_archives/en/index.html](http://www.who.int/influenza/human_animal_interface/H5N1_cumulative_table_archives/en/index.html).

than 1,500 cases of AI have been documented in humans in the last 50 years.<sup>8</sup> Public health officials and animal health officials vigilantly monitor avian AI because of the unique ability of influenza A viruses to genetically reassort to more pathogenic—and possibly mammalian—strains.

### 1.4.6 Ecology

Many avian species are susceptible to infection with HPAI viruses, including

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

HPAI has primarily been isolated from chickens and turkeys.<sup>9</sup> 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, including H5, H7, and H9 subtypes.

#### 1.4.6.1 RESERVOIR

AI viruses usually infect migratory waterfowl, particularly Anseriformes (ducks and geese) and Charadriiformes (shorebirds) that can carry LPAI viruses without showing illness. LPAI virus strains occur worldwide and have been isolated from more than 100 different species of birds.<sup>10</sup> The wild-bird reservoir of LPAI viruses is considered a major potential source of infection for domestic birds, particularly free- and open-range poultry.

There is not currently evidence of HPAI generation in a reservoir, though HPAI viruses have occasionally been isolated from free-living wild birds. However, an outbreak of HPAI can occur in any location because LPAI H5 and H7 strains are transmitted from reservoirs into domestic poultry. Following this transmission, the virus can mutate or reassort in gallinaceous poultry flocks, resulting in an HPAI virus.<sup>11</sup> Evidence also shows that several HPAI H5N1 strains have caused

---

<sup>8</sup> David E. Swayne and Colleen Thomas, “Trade and Food Safety Aspects for Avian Influenza Viruses,” in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

<sup>9</sup> OIE, *Highly Pathogenic Avian Influenza*, Technical Disease Card, 2009, <http://www.oie.int>.

<sup>10</sup> David E. Swayne, “Epidemiology of Avian Influenza in Agricultural and Other Man-Made Systems,” in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

<sup>11</sup> OIE, *Highly Pathogenic Avian Influenza*, Technical Disease Card, 2009, <http://www.oie.int>.

---

subclinical infections in domestic ducks, serving as a potential pathway for transmission of HPAI to domestic poultry populations.

#### 1.4.6.2 INTRODUCTION AND TRANSMISSION OF AI IN POULTRY

Contact with infected wild birds is a common mode of introduction of AI into a poultry population. Live poultry markets have been documented as a significant source in the generation and dissemination of both LPAI and HPAI in Hong Kong, the Americas, and Southeast Asia from the 1990s to the present.

HPAI virus is usually 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. When a hen is infected, the HPAI virus is also likely to be present on the eggshell and internal egg contents, though to date there is no evidence demonstrating vertical transmission.<sup>12</sup>

#### 1.4.6.3 PERSISTENCE IN ENVIRONMENT AND ANIMAL PRODUCTS

HPAI viruses are easily inactivated by heat, but may remain viable for longer in cold and humid environments. The H5N1 and H5N2 HPAI viruses have been found to survive in liquid feces between 7 days (at 20°C) and 105 days (under freezing conditions). Two H5N1 HPAI viruses were also shown to persist in water in cool temperatures: surviving for 94–158 days at 17°C, but not after 30 days at 28°C.<sup>13</sup>

AI viruses can also be isolated from animal products, including eggs and egg products. The OIE recommends that all poultry meat reach 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.<sup>14</sup> AI viruses can also survive for several days in carcasses at ambient temperatures, a few weeks when refrigerated, and indefinitely when frozen.<sup>15</sup>

#### 1.4.7 Diagnosis in Avian Species

The incubation period for HPAI viruses in naturally infected chickens ranges from 3 to 14 days.<sup>16</sup> The OIE *Terrestrial Animal Health Code* (2012) gives the

---

<sup>12</sup> OIE, *Highly Pathogenic Avian Influenza*, Technical Disease Card, 2009, <http://www.oie.int>.

<sup>13</sup> David E. Swayne, “Epidemiology of Avian Influenza in Agricultural and Other Man-Made Systems,” in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

<sup>14</sup> OIE, Article 10.4.25 and 10.4.26 *Terrestrial Animal Health Code*, 2012, <http://www.oie.int>.

<sup>15</sup> OIE, *Highly Pathogenic Avian Influenza*, Technical Disease Card, 2009, <http://www.oie.int>.

<sup>16</sup> David E. Swayne, “Epidemiology of Avian Influenza in Agricultural and Other Man-Made Systems,” in David E. Swayne, ed., *Avian Influenza* (Ames, IA: Blackwell Publishing, 2008).

incubation period for NAI as 21 days.<sup>17</sup> AI may have longer incubation periods in some species than others.

#### 1.4.7.1 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.

##### 1.4.7.1.1 Galliformes

Common clinical signs of HPAI in galliform birds (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.

##### 1.4.7.1.2 Anseriformes

Anseriformes (such as ducks and geese) usually do not show clinical signs with infection of LPAI. In the case of HPAI, the most common clinical signs include

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

#### 1.4.7.2 GROSS PATHOLOGICAL LESIONS

Lesions have been observed in susceptible avian species, but they are extremely variable. Galliformes with HPAI may not have prominent lesions, except those

---

<sup>17</sup> OIE, Article 10.4.1 “General provisions,” *Terrestrial Animal Health Code*, 2012, <http://www.oie.int>.

---

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, pancreatic mottling, and others.

#### 1.4.7.3 DIFFERENTIAL DIAGNOSES

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

### 1.4.8 Immunity

#### 1.4.8.1 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. A systemic Immunoglobulin M response by 5 days post-infection is followed shortly by an Immunoglobulin G response. The intensity of the antibody response varies with bird species. The antibody response decreases in different species in the following order:

1. Chickens
2. Pheasant
3. Turkeys
4. Quail
5. Ducks.

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, but in layers, 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 the shedding.

#### 1.4.8.2 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.<sup>18</sup>

#### 1.4.8.3 VACCINATION

Vaccination against many AI virus subtypes has been used in a variety of poultry species. The effectiveness of vaccination in preventing clinical signs and mortality is well documented. However USDA APHIS responds to an HPAI outbreak by implementing sanitary measures and a stamping-out policy that involves culling of poultry infected (or suspected of being infected). Under certain conditions, an emergency vaccination strategy could and may 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 later in this document.

---

<sup>18</sup> OIE, Article 10.4.29 “Surveillance strategies” *Terrestrial Animal Health Code*, 2012. [www.oie.int](http://www.oie.int).



## Chapter 2

# Framework for HPAI Preparedness and Response

---

## 2.1 NATIONAL RESPONSE FRAMEWORK, NATIONAL INCIDENT MANAGEMENT SYSTEM, AND NATIONAL ANIMAL HEALTH EMERGENCY MANAGEMENT SYSTEM INTEGRATION

Successful emergency preparedness for and response to HPAI requires integration between the National Response Framework (NRF), National Incident Management System (NIMS), and National Animal Health Emergency Management System (NAHEMS). This HPAI-specific plan fits into this hierarchy to provide more detailed information and specific direction on response requirements in the event of an HPAI outbreak in the United States.

### 2.1.1 National Response Framework

The NRF is a guide to how the Nation conducts all-hazards response. It describes 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. It builds on NIMS, which provides a consistent template for managing incidents. The NRF is available from <http://www.fema.gov/emergency/nrf/>.

### 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, to reduce the loss of life, liberty, property, and harm to the environment. NIMS provides a core set of concepts, principles, procedures, organizational processes, terminology, and standard requirements. NIMS information is available at <http://www.fema.gov/emergency/nims/>.

NIMS consists of five key components:

1. A set of preparedness concepts and principles for all hazards;

- 
2. Essential principles for a common operating picture and interoperability of communications and information management;
  3. Standardized resource management procedures that enable coordination among different jurisdictions or organizations;
  4. Scalability, for use in all incidents (ranging from day to day to large scale); and
  5. A dynamic system that promotes ongoing management and maintenance.

### 2.1.3 National Animal Health Emergency Management System

APHIS and its stakeholders established NAHEMS to provide a functional framework for responding to foreign animal disease (FAD) emergencies through NAHEMS Guidelines, disease response plans (such as this HPAI-specific plan), SOPs, and other associated documents. The purpose of the NAHEMS Guidelines is to ensure a successful response commensurate with the severity of the outbreak. Federal, State, and local agencies; Tribal nations; and other groups involved in animal health emergency management activities should integrate the information provided in NAHEMS Guidelines into their preparedness plans.

NAHEMS Guidelines (and other FAD PReP documents) offer

- ◆ 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.

In particular, NAHEMS Guidelines provide a foundation for coordinated national, regional, State, Tribal, and local activities in an emergency situation. These guidelines serve as a practical guide and complement non-Federal preparedness activities.

These NAHEMS documents can be found at the FAD PReP website (<https://fadprep.lmi.org>), at <http://inside.aphis.usda.gov/vs/em/fadprep.shtml> for APHIS employees and select documents are also available at [http://www.aphis.usda.gov/animal\\_health/emergency\\_management](http://www.aphis.usda.gov/animal_health/emergency_management).

## 2.1.4 Coordination and Collaboration

This *HPAI Response Plan* is coordinated with the other FAD PReP documents, which follow 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 for industry stakeholders 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 relationships, FAD PReP efforts raise awareness of critical issues, and collaborate to address significant problems. Exercises and real events can also help improve HPAI preparedness, providing valuable insight to improve existing plans and efforts.

## 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 subsection 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, like an HPAI outbreak, USDA coordinates incident management teams, manages incident response, manages public messages, and takes measures to control and eradicate HPAI. Measures used to control and eradicate HPAI include quarantine and movement control, epidemiologic investigation, appraisal and compensation, depopulation (euthanasia) of affected livestock, carcass disposal, cleaning and disinfection, active surveillance for additional cases, diagnostics, and, potentially, emergency vaccination.

---

The USDA (not including the additional ESFs of the U.S. Forest Service, which is a part of USDA) performs the primary, coordination, and support roles in Emergency Support Function (ESF) #11—Agriculture and Natural Resources—under the NRF. It also plays supporting roles in the following ESFs:

- ◆ ESF #3—Public Works and Engineering
- ◆ ESF #5—Emergency Management
- ◆ ESF #6—Mass Care, Emergency Assistance, Housing, and Human Services
- ◆ ESF #7—Logistics Management and Resource Support
- ◆ ESF #8—Public Health and Medical Services
- ◆ ESF #10—Oil and Hazardous Materials Response
- ◆ ESF #12—Energy
- ◆ ESF #14—Long-Term Community Recovery (primary agency role)
- ◆ 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). ([Appendix B](#) of this plan contains an organizational chart showing the coordination between DHS/Federal Emergency Management Agency and USDA in the event of a major HPAI outbreak.)

## 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 <https://fadprep.lmi.org> and [http://www.aphis.usda.gov/animal\\_health/emergency\\_management/](http://www.aphis.usda.gov/animal_health/emergency_management/).

## Chapter 3

# USDA HPAI Preparedness and Response

---

### 3.1 USDA

USDA APHIS is the Federal agency with primary responsibility and authority for animal disease control and will interface 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 leads 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 Surveillance and Emergency Response Program that provides assistance for the targeted surveillance of diseases in wildlife, including AI.

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

#### 3.1.1 Preparedness Exercises

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 have been conducted to simulate an HPAI outbreak and response effort in the United States. These exercises allow responders to discuss and practice activities such as diagnostic sampling and to think about public health issues that would surround an HPAI outbreak.

The National Veterinary Stockpile (NVS) has also conducted multiple exercises to assess and test its ability to deliver supplies (including vaccine) and services and State and Tribal ability to receive and stage these items in the event of an HPAI outbreak. These exercises have incorporated multiple State and Tribal agencies, the poultry industry, and academia to simulate a response effort. Valuable logistics lessons learned and important recommendations have resulted from the evaluation of these exercises.

---

### 3.1.2 Domestic Activities

USDA has a variety of ongoing preparedness and response activities with respect to HPAI. Domestically, the USDA prevents the introduction of AI, 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 major component of 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 NPIP, a voluntary industry-State-Federal 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.
- ◆ *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.
- ◆ *National Center for Import and Export.* All live birds, except from Canada, are quarantined for at least 30 days in a USDA-approved quarantine facility and tested for AI. Pet birds returning from H5N1-infected areas must go to a USDA animal import quarantine facility. All hatching eggs are quarantined for 30 days in a USDA-approved quarantine facility and tested for AI (except those from Canada and other countries free from AI and Newcastle disease).
- ◆ *Public health.* USDA engages public health agencies to ensure coordination in the event of an HPAI outbreak in poultry.
- ◆ *Emergency veterinary assistance.* USDA works to assist States in training and maintaining State Incident Management Teams and veterinary reserve corps, such as the National Animal Health Emergency Response Corps (NAHERC), ([Subsection 3.5](#)). State groups will serve as early response

teams for an HPAI event and can educate groups on the signs, symptoms, and reporting procedures.

- ◆ *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.
- ◆ *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 will work 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.
- ◆ *Other preparedness and disease models.* USDA uses an enhanced version of the North American Animal Disease Spread Model (NAADSM) to develop computer-generated scenarios for HPAI. The NAADSM is used to evaluate the potential consequences of HPAI incursions in the United States, including the countermeasures, materials, and supplies needed for control and eradication.

### 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, such as H5N1, 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.

USDA overseas embassy offices also 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, will coordinate a response to any such trade disruption and communicate with industry in the United States. USDA APHIS would also quickly fulfill any official requests for additional scientific U.S. HPAI domestic poultry flock case surveillance, movement control measures, and laboratory diagnostics.

These efforts focus on cases where bans are inconsistent with OIE standards, or with any U.S. AI bilateral protocols. OIE member countries, like the United States, are to “immediately” notify the OIE of any confirmed HPNAI or LPNAI cases in poultry, defined in the OIE *Terrestrial Animal Health Code (2012)* 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, they are to notify in the case of LPAI H5 or H7 in commercial poultry.

International standards for HPAI in poultry do allow countries to impose bans on exports from HPAI-infected countries and zones. USDA actively maintains a list of HPAI-affected countries on the Internet:

[http://www.aphis.usda.gov/import\\_export/animals/animal\\_import/animal\\_imports\\_hpai.shtml](http://www.aphis.usda.gov/import_export/animals/animal_import/animal_imports_hpai.shtml).

### 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 (2012)*, by trading partners through the establishment of parameters and agreement on necessary measures *before a disease outbreak*.

Implementation of compartmentalization will rely on producers, industry, and State and Federal animal health authorities. 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 (2012)* explain the concept and the application of compartmentalization. More information on compartmentalization can be found in the NAHEMS Guidelines: Regionalization for International Trade.

## 3.2 USDA 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 helps to support the control and eradication actions. Accordingly, APHIS has adopted NIMS and Incident Command System (ICS) organizational structures to manage the response to an HPAI outbreak. The 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. The next section discusses the APHIS incident management organizational structure.

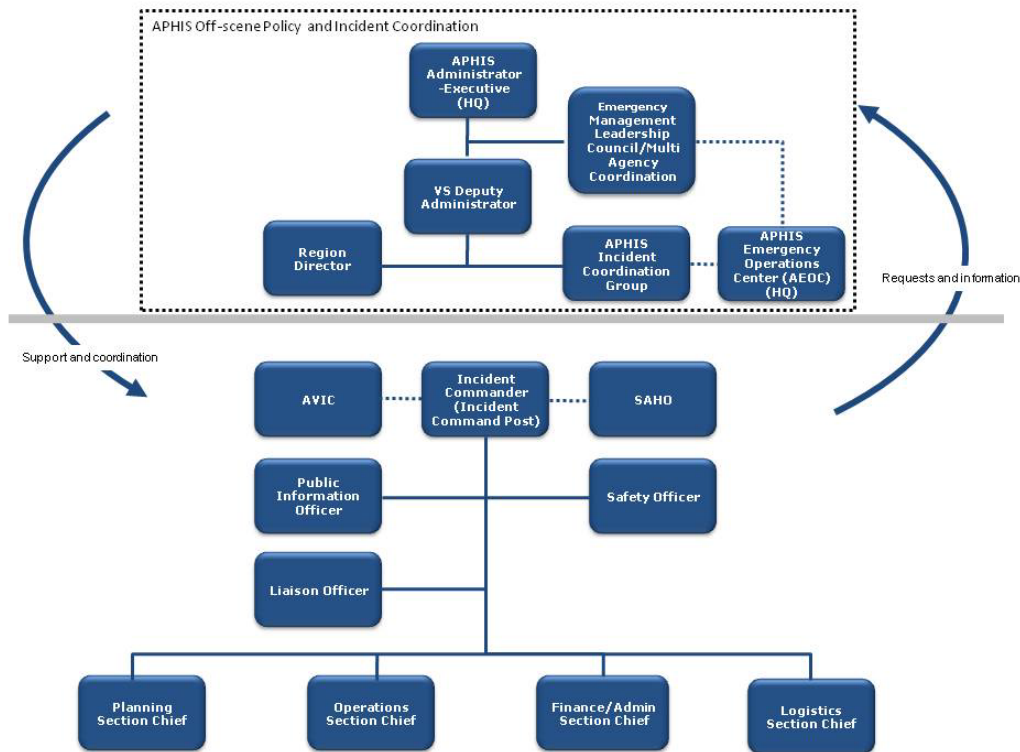
## 3.3 APHIS INCIDENT MANAGEMENT STRUCTURE

The APHIS Administrator is the Federal executive responsible for implementing APHIS policy during an HPAI outbreak. The APHIS Administrator will delegate much of the actual multiagency coordination (MAC) functions to the Veterinary Services (VS) Deputy Administrator, who is the Chief Veterinary Officer (CVO) of the United States, and the APHIS Emergency Management Leadership Council (EMLC).

The VS Deputy Administrator and the EMLC will establish an APHIS Incident Coordination Group (ICG) to oversee the staff functions associated with the incident at the APHIS headquarters level. The APHIS ICG will work closely with the personnel in charge of establishing operations for the incident response at the Area Command (AC) or Incident Command Post (ICP) in the field and coordinate with the APHIS MAC Group.

Figure 3-1 displays the APHIS FAD incident management organizational structure, starting with the APHIS Administrator.

Figure 3-1. APHIS Multiagency Coordination Structures and APHIS Emergency Operations Center: Relationship to Incident Management Team (Assuming a Single Incident)



Note: AVIC = Area Veterinarian in Charge; SAHO = State Animal Health Official.

The following subsections describe the MAC Group and APHIS ICG, as well as the APHIS organization for single and multiple incidents. ([Appendix B](#) contains further information and organizational diagrams describing APHIS's Incident Management Structure.) Also, see the *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0) and *NCAHEM Incident Coordination Group Plan*.

### 3.3.1 Multiagency Coordination Group

The APHIS *Emergency Mobilization Guide* defines coordination for major HPAI responses at the APHIS level. In the event of an HPAI outbreak, the EMLC typically serves as the APHIS MAC Group, unless the members decide to transfer responsibility for a specific incident (please see [Appendix B](#) for a list of EMLC members). The APHIS MAC Group structure is adaptable and easily expands and contracts to provide flexibility. The MAC Group—formed if the HPAI response needs more support—establishes supportive relationships among the agencies preparing for and responding to an HPAI outbreak.

The APHIS MAC Group offers guidance on the most efficient way to allocate resources during an HPAI outbreak. General functions of the group include

- ◆ incident prioritization,
- ◆ resource allocation and acquisition, and
- ◆ identification and resolution of issues common to all parties.

If additional support is needed, particularly in the event there are significant threats or consequences to public health and welfare, the natural environment, or the economy, the USDA may also stand up other MAC Groups, which may be composed of representatives from other programs and agencies.

### 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. For additional information, see the *NCAHEM Incident Coordination Group Plan*. APHIS ICG responsibilities in an HPAI outbreak include

- ◆ providing guidance to ensure responder and public health and safety,
- ◆ supporting ICP(s) and AC(s),
- ◆ assisting in coordinating resources and integrating response organizations into the ICS, and
- ◆ providing information to the Joint Information Center (JIC) for use in media and stakeholder briefings.

### 3.3.3 Organization for a Single Incident

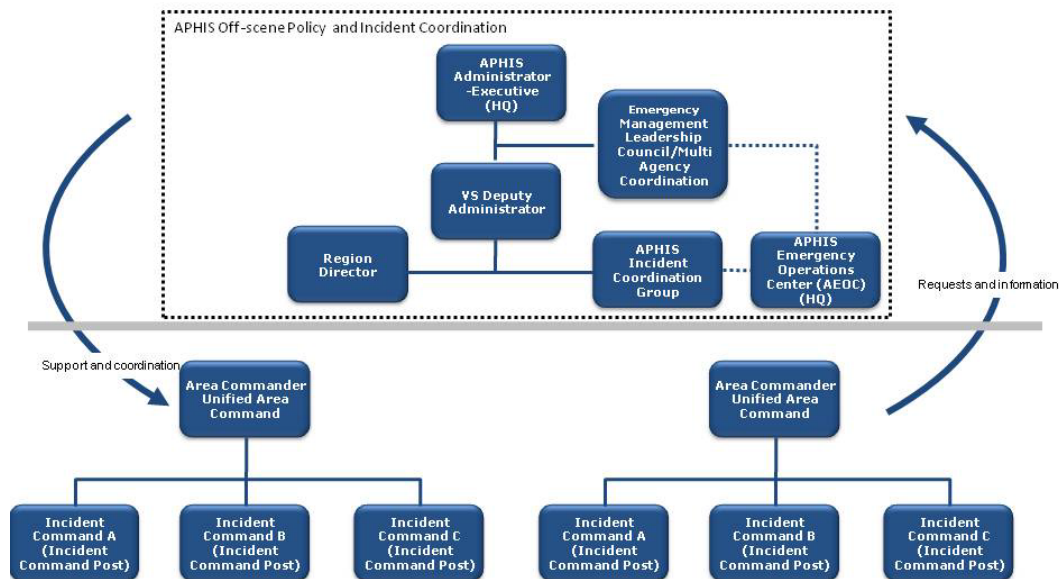
In the event of a single HPAI incident, the State Animal Health Official (SAHO), or designee, and Area Veterinarian in Charge (AVIC), or designee, will initially serve as the Co-Incident Commanders for the unified IC. The AVIC and SAHO may be relieved by a VS Incident Management Team if there is a delegation of authority.

### 3.3.4 Organization for Multiple Incidents

When more than one HPAI incident happens simultaneously, more than one ICP may be established. An AC may also be established. The VS Region Director will establish a Unified Area Command, and the Area Commander will be responsible for managing all the incidents. The AVIC and SAHO for each incident (or the

Incident Management Team) will report to the AC. Figure 3-2 shows the organization for multiple incidents.

*Figure 3-2. APHIS Multiagency Coordination Structures and APHIS Emergency Operations Center: Relationship to Multiple Incident Management Team Structures (Assuming Multiple Incidents and a Unified Area Command)*



If the emergency response becomes too complex for a single APHIS MAC Group to handle efficiently—for example, a large multistate HPAI incident with numerous response activities—cooperation with other agencies or committees will be implemented. As stated previously, this is referred to as multiagency coordination. Other MAC Groups would likely be stood up. These groups, comprised of representatives from across USDA sub-agencies or other government agencies, would make decisions regarding the prioritizing of incidents and the sharing and use of critical resources. However, these groups are not part of the on-scene IC.

### 3.3.5 Guidance on Incident Management and Organizational Strategy

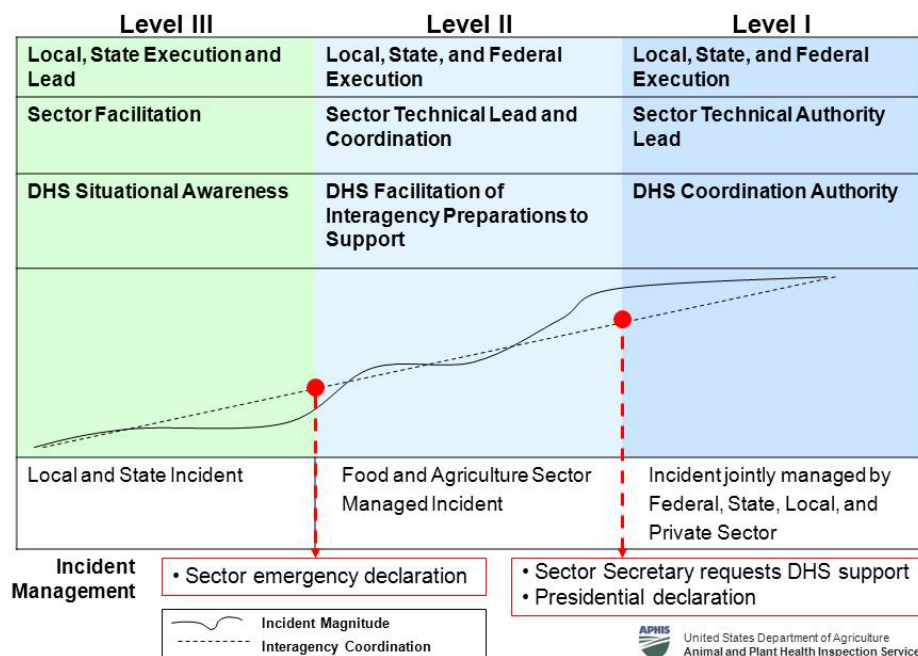
See [Appendix B](#) for further information on incident management and organizational structure.

## 3.4 APHIS INCIDENT MANAGEMENT LEVELS

APHIS uses a three-level system of emergency response 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, an 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 will make a request through the EMLC 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 (NAHERC)

In addition to the activities just discussed, NAHERC assists and augments Federal and State response to domestic and international animal disease outbreaks, threats, or natural disasters. NAHERC is composed of veterinarians and veterinary technicians who volunteer to become temporary Federal employees in the event of a national animal health emergency. For further information on NAHERC and NAHERC deployment, see the NAHEMS Guidelines: NAHERC Deployment Guide.

## 3.6 DIAGNOSTIC RESOURCES AND LABORATORY SUPPORT

USDA also has critical diagnostic resources and laboratory support that will be 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 the Nation's poultry and livestock. The NVSL provides *all* confirmatory testing for HPAI on all specimens 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 50—including NVSL-Ames—are currently approved to conduct AI testing diagnostics ([Appendix C](#)).

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 will be made at NVSL-Ames. After positive confirmation of HPAI, subsequent samples from premises inside the established Control Area (CA) *may* be sent to laboratories that are part of NAHLN. Please see [Subsection 5.4.1](#) for more information.

### 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 would 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;
- ◆ 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 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. They will also 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 preventive measures, including extensive AI surveillance, import restrictions, and education programs. In the event of an HPAI outbreak, USDA and the affected States will work with the poultry industry to control and eradicate the disease as expeditiously as possible. In an HPAI outbreak, the USDA will also coordinate with the CDC and other public health authorities, including at the State, Tribal, and local level, as needed.

---

## 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 execute the response strategy. Box 4-1 lists these critical activities and tools. A science- and risk-based approach that protects public and animal health and stabilizes animal agriculture, the food supply, and the economy will be employed at all times. Please see [Chapter 5](#) for more information on these activities and tools, (i.e., movement control, disposal, and epidemiological investigation and tracing).

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

#### **Critical Activities and Tools for Containment, Control, and Eradication**

- Public awareness campaign
- Swift imposition of effective quarantine and movement controls
- Rapid diagnosis and reporting
- Epidemiological investigation and tracing
- Increased surveillance
- Continuity of business measures for non-infected premises and non-contaminated animal products (for example, see [Appendix D](#) on the Secure Egg Supply [SES] Plan)
- Biosecurity measures
- Mass depopulation and euthanasia, potentially including preemptive culling
- 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 HPAI virus and susceptible poultry.*
  - a. This is accomplished through quarantine of infected poultry and movement controls in the Infected Zone(s) and Buffer Zone(s) [Control Areas (CA)], along with biosecurity procedures to protect non-infected animals.

- 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 but lesser transmission risk posed by other 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 biosecurity and cleaning and disinfection measures.
2. *Stop the production of HPAI virus by infected or exposed animals.* This is accomplished by slaughter or mass depopulation (and disposal) of infected and potentially infected poultry.
  3. *Increase the disease resistance of susceptible poultry to the HPAI virus.* This is accomplished by strategic emergency vaccination.

### 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 a coordinated public awareness campaign to an effective response strategy.

*Box 4-2. Coordinated Public Awareness Campaign*

#### **Coordinated Public Awareness Campaign**

In all HPAI outbreaks, a public awareness campaign must be effectively coordinated. This will support 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 the issues and concerns relating to food safety, public health, and animal welfare;
- addressing issues and concerns related 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 will occur. As seen in Figure 4-1, these critical tasks are fundamental to the rapid control and containment of HPAI.

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 may 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. A decision to use emergency vaccination will be based on the prevailing epidemiological circumstances during the outbreak. Please see [Chapter 5, Subsection 5.16](#) for information on emergency vaccination. Other response critical activities and tools are also employed, such as health and safety, biosecurity, surveillance, disposal, and movement control (see [Chapter 5](#)). This chapter 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 [Subsection 5.14](#) in the next chapter). The OIE definition of stamping-out is provided in [Subsection 4.5.1](#).

## Box 4-3. Strategy of Stamping-Out HPAI

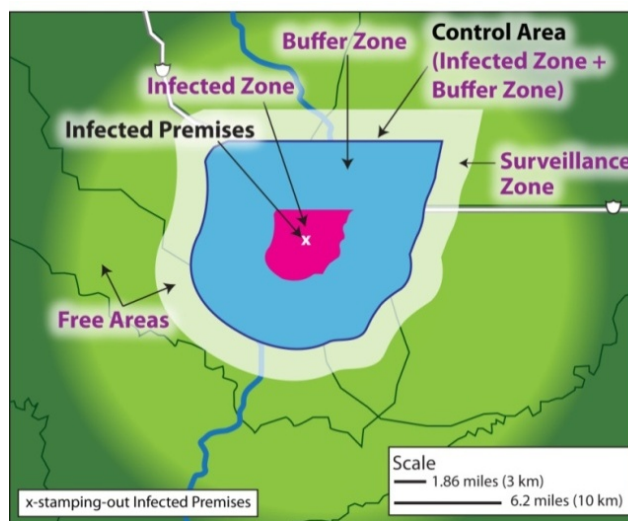
**Stamping-Out: Critical Goals**

- Within 24 hours of (or as soon as possible after) a premises being classified as an Infected Premises (IP), infected poultry will be depopulated in the quickest, safest, and most humane way possible. In many cases, poultry on Contact Premises (CP) may also be depopulated as soon as possible.
- Where resources are limited, premises will be 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 IP are depopulated. See [Subsection 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 Control and Eradication Strategy for Other Animals

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 will be 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 will be appropriately monitored to ensure that currently infected animals are not sent to slaughter or other premises. Further strategies are implemented, in collaboration with public health agencies, to limit human exposure. Other measures that are appropriate to the given situation may be applied to species other than poultry.

Susceptible animals, as referred to in this response plan, are limited to poultry unless otherwise specified in the case definition during the outbreak. Additional susceptible animals or species will be determined, as needed, by the current knowledge of the epidemiology of the event. The USDA will notify and coordinate 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).

#### 4.3.4 Assessing a Possible Outbreak

During the investigation of a 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. This assessment includes

- ◆ a history of clinical and epidemiological findings,
- ◆ results of physical examinations,
- ◆ necropsy findings,
- ◆ specimen collection and submission to an approved laboratory,
- ◆ reporting, and
- ◆ initiating appropriate control measures.

Incident management includes quarantine and movement control, tracing, activation of response plans, and communicate 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 possible.

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 measures implemented.

### 4.3.5 Authorization for Response and Associated Activities

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 State, Tribal, Federal, or local authorities.

When the criteria for a presumptive HPAI case have been met (see [Chapter 5](#) for case definitions), the APHIS Administrator or VS Deputy Administrator (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 and investigation of CP. Personnel may also depopulate poultry on any CP meeting the criteria for a presumptive case. APHIS and SAHOs will assess 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.

When HPAI is detected, SAHOs and Tribal officials issue a quarantine or hold order for the IP. A Federal quarantine may be issued when requested by SAHOs or as directed by the Secretary of Agriculture. The Incident Commander works with the Operations Section and Situation Unit in the Planning Section to determine zone, area, and premises designations during an HPAI outbreak.

### 4.3.6 Management of Incident

The outbreak response effort should be implemented through an ICS with an appropriate span of control and delegation of authority. Responses will be as local as possible. Good communication within the chain of command is imperative.

An Incident Commander should be identified and an ICP established. In-State resources (whether State, Federal, Tribal, local, or privately owned) should be used to manage a local response. Out-of-State resources may be used to support the State impacted by the outbreak. The USDA will notify and coordinate with public health agencies in response to HPAI in poultry.

## 4.4 FACTORS INFLUENCING RESPONSE

The previous sections identified the primary response strategy for an HPAI outbreak. Detection of HPAI will result in emergency intervention by State, Tribal, Federal, and local authorities; the scope of regulatory intervention will depend 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 (social and political) by different communities, from local to international.
- ◆ *Scale of outbreak.* The number of poultry infected, species infected, number of premises infected, and susceptible 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 other IP.
- ◆ *Veterinary countermeasures available.* The availability and efficacy of veterinary countermeasures such as HPAI vaccines.
- ◆ *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 that can be confined to a Containment Zone, is a stamping-out policy in domestic poultry. Stamping-out, as defined in the OIE *Terrestrial Animal Health Code* (2012) means

carrying out under the authority of the Veterinary Authority, on confirmation of a disease, 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 of a kind likely to cause the transmission of the causal pathogen. All susceptible animals, vaccinated or unvaccinated, on an infected premises should be killed and their carcasses destroyed by burning or burial, or by any other method which will eliminate the spread of infection through the carcasses or products of the animals killed.

This policy should be accompanied by the cleansing and disinfection procedures defined in the Terrestrial Code.



The term modified stamping-out policy should be used in communications to the OIE whenever the above animal health measures are not implemented in full and details of the modifications should be given.

The OIE recognizes that if outbreaks cannot be confined to a Containment Zone (equivalent to a CA), response strategies other than just stamping-out may be necessary.

## 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 notifiable HPAI-freedom, but OIE members can self-declare their entire territory or a zone within their territory free from certain OIE-listed diseases, such as HPNAI and NAI.

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 HPNAI or NAI. 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 stated in Article 10.4.27 of the OIE *Terrestrial Animal Health Code (2012)*, no member can declare itself free from HPAI (or LPNAI) in wild birds, and 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) an NAI-free country, zone, or compartment and (2) an HPNAI-free country, zone, or compartment. These determinations are described in the OIE *Terrestrial Animal Health Code (2012)* in Articles 10.4.2, 10.4.3, and 10.4.4. The criteria for an HPNAI-free country, zone, or compartment are as follows:

A country, zone, or compartment may be considered free from HPNAI when:

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

The FAD PReP SOPs and NAHEMS Guidelines referenced in this chapter can be found for APHIS employees at <http://inside.aphis.usda.gov/vs/em/fadprep.shtml>. For others, please go to <https://fadprep.lmi.org> or [http://www.aphis.usda.gov/animal\\_health/emergency\\_management](http://www.aphis.usda.gov/animal_health/emergency_management) (for selected documents).

### 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 [Subsection 5.2.3](#)). These definitions are available here for APHIS employees: [http://inside.aphis.usda.gov/vs/ceah/nsu/case\\_definitions.shtml](http://inside.aphis.usda.gov/vs/ceah/nsu/case_definitions.shtml), and also on the FAD PReP website, <https://fadprep.lmi.org>.

#### 5.2.1 Laboratory Definitions

The following subsections include APHIS-VS Centers for Epidemiology and Animal Health (CEAH) National Surveillance Unit (NSU) draft definitions for NAI from February 2011, which are undergoing review. 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 [poultry] are evaluated using laboratory criteria for HPNAI and LPNAI defined by one or more of the following diagnostic strategies:

1. *Virus isolation and identification*: specimens for virus isolation include tracheal/oropharyngeal and cloacal swabs, or fresh feces from live birds, or samples from pools of organs (trachea, lungs, air sacs, intestine, spleen, kidney, brain, liver, and heart) and feces from dead birds. A preparation of the specimen is inoculated into embryonated fowl 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 the following methods:
  - a. Demonstration of hemagglutination, AND
  - b. Confirmed presence of influenza A virus by agar gel immunodiffusion, AND
  - c. Subtype (HA and NA) determination by hemagglutination and neuraminidase inhibition tests.
2. *Strain virulence evaluation*:
  - a. Classification of the isolate as HPNAI by having an intravenous pathogenicity index greater than 1.2 or by causing at least 75 percent mortality within 10 days in 4- to 8-week-old chickens infected intravenously; OR, if no mortality occurs,
  - b. Determination of the amino acid sequence at the hemagglutinin cleavage site to identify viruses that have the capacity to become highly pathogenic.
  - c. If H5 or H7 subtypes do not meet the criteria for HPNAI, they are classified as H5/H7 LPNAI.
3. *Antigen capture and molecular techniques*: see virus isolation for sample type
  - a. *Antigen detection*—enzyme immunoassays (*only for flock level testing*);

- b. *Direct ribonucleic acid (RNA) detection*—reverse transcriptase polymerase chain reaction (RT-PCR) using nucleoprotein specific or matrix-specific conserved primers and subtype determination using H5- or H7-specific primers.
- 4. *Serological tests*: serum
  - a. Hemagglutination-inhibition (for H1–H16) and neuraminidase-inhibition (for N1–N9).
  - b. Agar gel immunodiffusion (AGID).
- 5. *Assumptions*: Influenza virus may be detected 48 hours post-infection (HPNAI by 24 hours post-infection) by real-time reverse transcriptase polymerase chain reaction (rRT-PCR) (Spackman 2006) and 1–5 days post-infection by antigen capture enzyme immunoassay (AC-EIA) (Gelb and Ladman 2006). The rRT-PCR tests on samples containing fecal material (i.e., cloacal swabs) lack sensitivity due to non-specific inhibitors as compared to oropharyngeal/tracheal specimens that have fewer inhibitors and higher sensitivity.

## 5.2.2 Case Definitions

The following subsections include APHIS-VS CEAH NSU draft definitions for NAI from February 2011, which are undergoing review.

### 5.2.2.1 CASE DEFINITION

- 1. *General comments*: AI can infect almost all species of birds. Domestic poultry meeting the clinical case definition for NAI H5/H7 are those with one or a combination 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, snickering, 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; petechial hemorrhages on internal organs (Easterday *et al.* 1997); OR, flocks that experience mortality as listed for each compartment as follows (Weaver *et al.* 2006):
  - a. Commercial broilers: mortality exceeding 4 birds/1,000 per day for 2 consecutive days.
  - b. Commercial layers: 4 times normal daily mortality for 2 consecutive days (0.5/1,000 per day for layers from 2 to 50 weeks and 0.75/1,000

- 
- per day for layers over 50 weeks) or 5 percent drop in egg production over 3 days.
- c. Commercial turkeys: mortality in excess of 2 birds/1,000 per day.
  - d. Backyard flocks: any sudden and significant mortality event or sudden drop in egg production should be investigated.
2. *Suspect case*: A tentative diagnosis of NAI based on the clinical case definition in consultation with SAHOs and APHIS' AVIC; OR positive laboratory samples taken during routine surveillance with or without the presence of clinical criteria.
  3. *Presumptive positive case*: A suspect case with one of the following criteria:
    - a. Detection of antibodies to influenza A in sera as determined by AGID serological test that cannot be explained by vaccination and subsequent subtyping by hemagglutination-inhibition and neuraminidase-inhibition and identification as H5 or H7 with any NA subtype; OR,
    - b. Identification of influenza A RNA by rRT-PCR and determination of subtype as H5/H7.
  4. *Confirmed positive case*: The *isolation* of influenza A virus and *identification* as an H5 or H7 subtype (NAI) and subsequent determination of *pathogenicity* (HPNAI or H5/H7 LPNAI) by USDA's 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, non-traditional 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 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 SAHOs. 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 USDA/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. Case definitions are developed by the NSU, in cooperation with NCAHEM. NSU coordinates review with SAHOs, subject matter experts, stakeholders, and VS units. Case definitions are approved by the VS Deputy Administrator (the U.S. CVO) and VS Leadership Team. 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 needs of the eradication effort.

## 5.3 SURVEILLANCE

Surveillance is a critical activity during an outbreak of HPAI. This section specifically focuses on surveillance in poultry. 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 will (1) define the present extent of HPAI and (2) detect 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 these populations;
- ◆ To provide complete surveillance data summaries and analysis at intervals as specified by IC; and
- ◆ 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, NSU is responsible for surveillance activities. 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 or tools, listed below. These tradeoffs are made employing initial information collected about the outbreak, and best estimates. During an outbreak, surveillance plans will change as new information becomes available. ([Appendix E](#) 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 given confidence and 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 Buffer Zone (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) and start developing a surveillance plan to be used in the SZ.
2. *The control and eradication period (from initial 72-hour period until last case is detected and eradicated).* Four key objectives need to be accomplished simultaneously in this period.
  - a. Detect IP, new and existing, so that control measures can be put in place.
  - b. Provide evidence that premises are free of HPAI, thereby permitting poultry and poultry product movements in the CA.
  - c. Evaluate the outbreak management control activities.
  - d. Provide evidence that the Free Area (FA) is free of disease, thereby enabling unrestricted poultry and poultry product movement.
3. *Post eradication.* The objective is to prove that the CA and FA are free of disease (using OIE recommendations and requirements on surveillance).

- 
- a. Prove DF on depopulated premises.
  - b. Prove DF on At-Risk Premises in the CA by random sampling or targeted sampling (choosing populations based on risk) on selected premises and selected flocks.
  - c. Prove DF in the FA, following OIE guidelines, using multiple methods including serological slaughter sampling and passive surveillance by veterinarians and the public.

### 5.3.2 Surveillance Sampling

The 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 will be finalized to sample and monitor premises for business continuity purposes and to survey premises that do not require daily poultry or product movement. (For more information on surveillance and sampling schemes for zones that require daily movement of eggs or egg products, see [Appendix D](#) and the *SES Plan* at [www.secureeggssupply.com](http://www.secureeggssupply.com). For additional information on the surveillance sampling scheme and the rationale for the detection threshold for premises that do not require daily poultry or product movement, see [Appendix E](#).)

Surveillance sampling, using appropriate disease detection sampling schemes, will begin 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 Infected Zone (IZ), BZ, and SZ, for both commercial and backyard premises.

*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 five 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 Pool:** Combines samples taken from five dead or euthanized sick birds out of the house's (flock's) daily dead birds into one sample.
- **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

The outbreak surveillance plan will have specific outbreak surveillance schemes for each zone (such as the IZ, BZ, and SZ). For example, a surveillance plan for the sampling frequency for commercial CP, Suspect Premises (SP), and Monitored Premises in the IZ would be to collect a 5-bird pool sample every other day for 14 days. This may need to be adapted for HPAI viruses that demonstrate longer incubation periods. Feasible sampling frequencies are provided in [Appendix E](#).

In the SZ, the number of premises to be sampled is based on detecting at least one IP where the prevalence rate of IP equals or exceeds 5 percent, at the 95 percent confidence level. ([Appendix E](#) 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, surveillance inside the CA will be intensified by

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

---

Surveillance will be conducted in both the CA and FA. Investigation of suspect disease cases will augment the surveillance scheme. (Chapter 6 and Appendix E 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 (<http://inside.aphis.usda.gov/vs/ceah/nsu/toolbox/>), or to those outside APHIS by e-mailing ([national.surveillance.unit@aphis.usda.gov](mailto:national.surveillance.unit@aphis.usda.gov)), provides additional surveillance resources.

## 5.4 DIAGNOSTICS

Effective and appropriate sample collection, diagnostic testing, surge capacity, and reporting are critical in an effective HPAI response. These activities will require additional resources in the event of an HPAI outbreak. Sample collection will require 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 within 12 of hours of diagnostic test completion.

The FAD PReP Diagnostics SOP offers detailed information on diagnostic sample collection, diagnostic testing, surge capacity, and reporting. In particular, this SOP provides additional guidance on who is responsible for diagnostic testing, sample collection and processing, and analyzing diagnostic test results. (Appendix F references VS Memo 580.4 which contains more information on submitting diagnostic samples.) For packaging and labeling submissions, see [http://www.aphis.usda.gov/animal\\_health/lab\\_info\\_services/packaging\\_labeling.shtml](http://www.aphis.usda.gov/animal_health/lab_info_services/packaging_labeling.shtml).

### 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 are required for species other than poultry.

Confirmatory tests are more specific and used to verify the presence of AI, identify specific viral subtypes, and evaluate pathogenicity. These definitive tests can take 5–10 days and involve isolating the virus in embryonated chicken eggs. This allows more detailed identification of the virus subtype and whether it is HPAI or LPAI. Confirmatory testing can take 5 to 10 days.

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

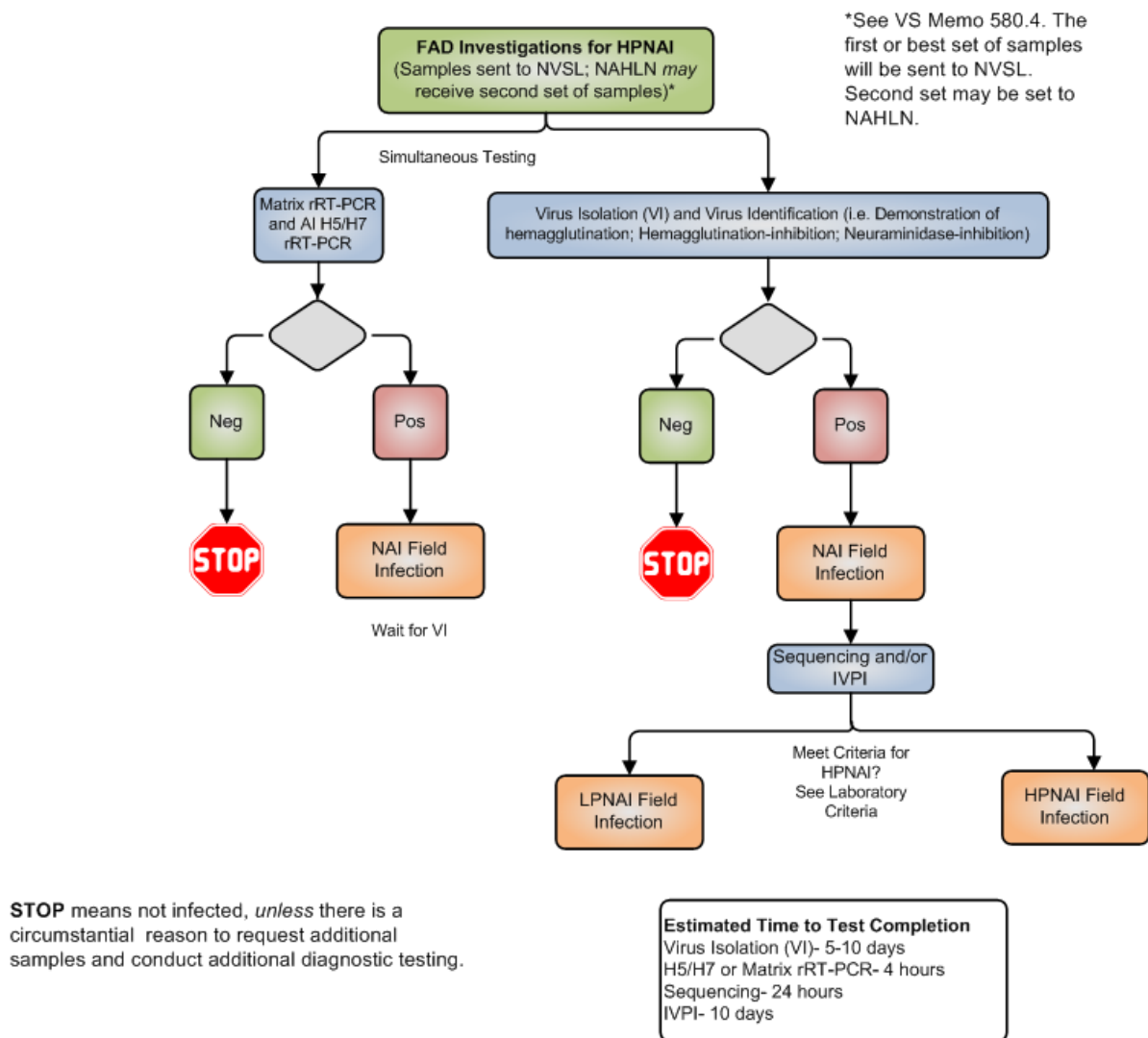
IC will provide specific instructions regarding the direction and collection of samples, which is likely to change as the outbreak evolves. In all cases, (1) NVSL will confirm the index case, (2) presumptive positive samples (on a rRT-PCR) from outside an established CA will be tested and confirmed by NVSL, and (3) NVSL will receive samples routinely from *inside* the CA to monitor for changes in the HPAI virus.

Because of the time required to perform virus isolation, it may be advantageous to report H5 or H7 presumptive results on the basis of molecular screening tests to facilitate a rapid and appropriate response for HPAI control and eradication.

Figure 5-1 illustrates the typical diagnostic flow of sample testing for an FAD investigation of potential HPAI.

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

#### FAD INVESTIGATIONS FOR HPAI



### 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 across the country 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 C](#) contains a list of the NAHLN labs approved to conduct HPAI diagnostics.

### 5.4.3 Reporting

Box 5-3 clarifies reporting and notification of H5 or H7 cases. APHIS VS Memorandum 565.16 (regarding NAI in domestic poultry) and VS Memorandum 580.4 (regarding FAD investigations) provide guidance on the investigation and reporting of AI positive and presumed positive cases. These memoranda are available on the FAD PReP website: <https://fadprep.lmi.org>.

#### *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 NAI and 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 will work with the Operations Section and Situation Unit within the 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 (see [Appendix B](#) for organizational charts). 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 5-1 summarizes the premises designations that are employed in an HPAI outbreak response. Table 5-2 summarizes the zone and area designations that would be used in an HPAI outbreak response. Figure 5-2 illustrates these premises, zone, and area designations.

*Table 5-1. Summary of Premises Designations*

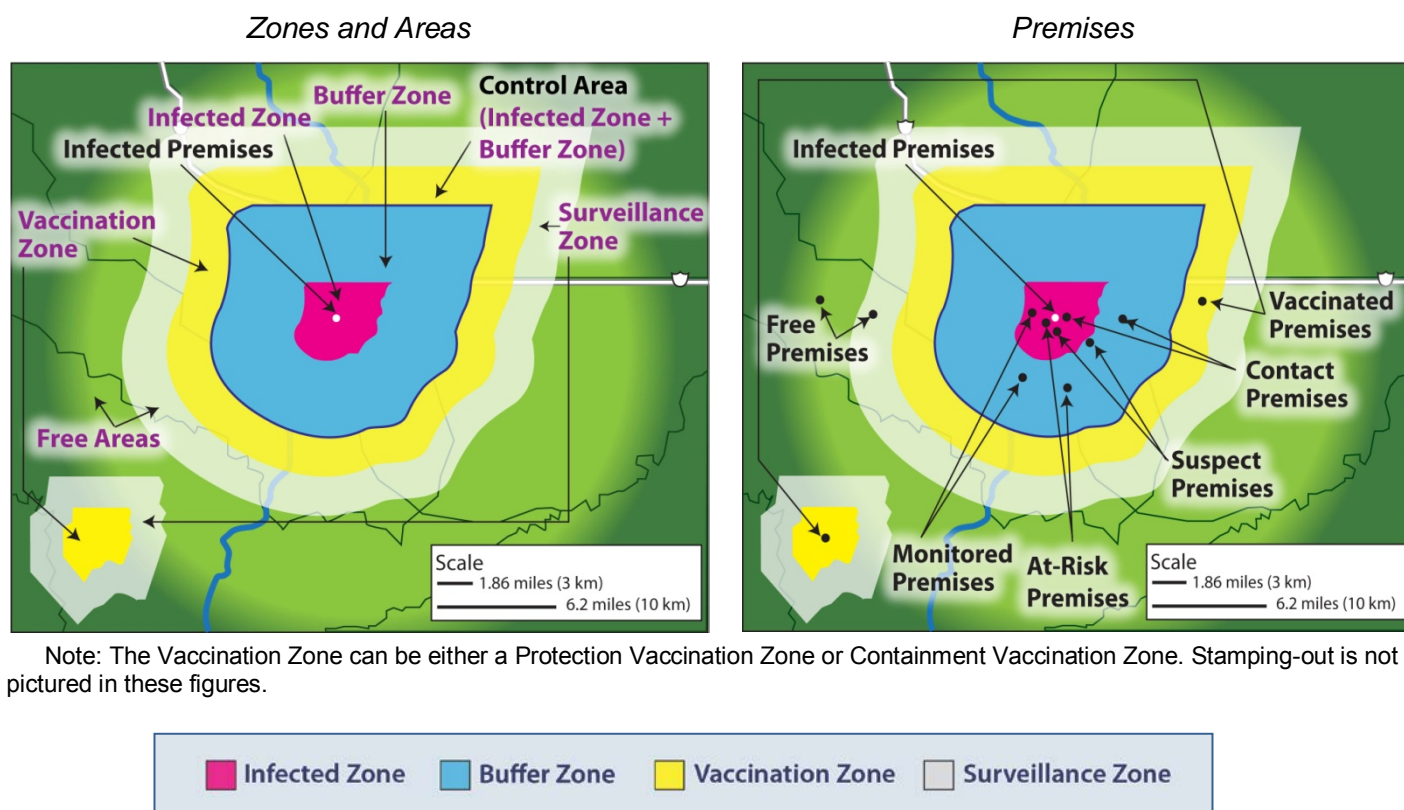
Premises	Definition	Zone
Infected Premises (IP)	Premises where a presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, HPAI case definition, and international standards.	Infected Zone
Contact Premises (CP)	Premises with susceptible animals 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 5-2. 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.
Free Area (FA)	Area not included in any Control Area.
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 5-2. Example of Zones, Areas, and Premises in HPAI Outbreak Response



### 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 will aid in the control of HPAI and lessen the impact during the response effort. [Appendix G](#) contains a sample template of an epidemiological questionnaire. Please note this questionnaire is from the *SES Plan*, and specifically focuses on eggs and egg products. Other factors may be considered when developing an epidemiological questionnaire, such as other species on premises and foreign travel among workers. The scope of any such questionnaire

---

should be based on the circumstances of the outbreak, and is at the discretion of the IC. The HPAI 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 will aid 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 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 will be obtained from many sources (such as reports from field veterinarians, producers, industry, farm service providers, or the public). The Emergency Management Response System (EMRS) is used to collect and report epidemiological data, including movement tracing information, locally and nationally.

### 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 5-3 provides a description of the minimum sizes of areas and zones. Table 5-4 reviews the factors used to determine the size of the CA.

Table 5-3. 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 5-4 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 5-4. Factors To Consider in Determining Control Area Size for HPAI

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

*Table 5-4. Factors To Consider in Determining Control Area Size for HPAI*

Factors	Additional Details
General area, region, or agricultural sector biosecurity	<ul style="list-style-type: none"> <li>◆ Biosecurity practices in place prior to outbreak</li> <li>◆ Biosecurity practices implemented once outbreak detected</li> </ul>
Number of backyard or transitional premises	<ul style="list-style-type: none"> <li>◆ Types of premises, animal movements, and network of animal and fomite movements</li> </ul>
Continuity of business	<ul style="list-style-type: none"> <li>◆ 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)</li> <li>◆ Permit processes, memorandums of understanding, and information management systems in place or activated at beginning of outbreak</li> </ul>

## 5.6 INFORMATION MANAGEMENT

Local, State, Tribal, and Federal information management systems need to be compatible for information and data sharing. In an HPAI outbreak, the response goal is to have EMRS information downloads or data entry processes performed in 24-hour or shorter intervals. 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 will be needed in an HPAI outbreak.

The Overview of Information Management SOP provides information on key selected systems (covered in the SOP in the following order):

- ◆ CoreOne (Surveillance Collaboration Services)
- ◆ Animal Health and Surveillance Management
- ◆ Veterinary Services Process Streamlining
- ◆ Animal Disease Traceability Information System
- ◆ NAHLN
- ◆ EMRS
- ◆ National Veterinary Logistics System
- ◆ LabWare Laboratory Information Management System
- ◆ Licensing, Serial Release, and Testing Information System
- ◆ Mobile Information Management.

It also covers the following APHIS information technology systems:

- ◆ APHIS Emergency Qualifications System
- ◆ Resource Ordering and Status System.

## 5.7 COMMUNICATION

The HPAI Communication 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) will serve 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 operate from 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 will be conveyed in an HPAI outbreak (Box 5-5).

### *Box 5-5. HPAI Communication Messages*

#### **Key Communication Messages**

Four key messages will be 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 will be conveyed to producers:

Protect your flocks 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: <http://www.usda.gov/birdflu>
- ◆ APHIS Animal Health website: [http://www.aphis.usda.gov/animal\\_health](http://www.aphis.usda.gov/animal_health)
- ◆ FAD PReP Stakeholder Coordination and Collaboration Resource Guide
- ◆ CDC website on AI: <http://www.cdc.gov/flu/avian>
- ◆ For information on the safe handling of poultry and poultry products, please see:  
[http://www.fsis.usda.gov/factsheets/Poultry\\_Preparation\\_Fact\\_Sheets/index.asp](http://www.fsis.usda.gov/factsheets/Poultry_Preparation_Fact_Sheets/index.asp).

## 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. 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 surveillance, prevention, and case management (as required). APHIS will work closely with public health authorities in a response. Unvaccinated workers 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.

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 culling, 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. 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/](http://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 Manual*: Available to APHIS employees at [http://inside.aphis.usda.gov/mrpbs/publications/safety\\_health\\_wellness\\_manual/index.shtml](http://inside.aphis.usda.gov/mrpbs/publications/safety_health_wellness_manual/index.shtml)
- ◆ APHIS Directive 6800.1, *Ensuring the Protection of Employees Involved in Highly Pathogenic Avian Influenza Control and Eradication Activities*: [http://www.aphis.usda.gov/library/directives/pdf/APHIS6800\\_1.pdf](http://www.aphis.usda.gov/library/directives/pdf/APHIS6800_1.pdf)
- ◆ CDC website on AI: <http://www.cdc.gov/flu/avian/>
- ◆ NAHEMS Guidelines: Health and Safety
- ◆ NAHEMS Guidelines: Personal Protective Equipment.

## 5.9 BIOSECURITY

An HPAI outbreak would potentially have a serious impact on the agricultural industry and on public health. USDA APHIS will coordinate with public health agencies to minimize risk to responders and others exposed to HPAI. Strict biosecurity measures need to be implemented 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 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](#). 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 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"> <li>• Movement of poultry, other livestock, vehicles, equipment, and people.</li> <li>• Contaminated feed and water.</li> <li>• Contact with poultry and other HPAI-susceptible animals.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean and disinfect premises, vehicles, and equipment, and dispose of materials that cannot be disinfected in an appropriate manner.</li> <li>• Account for the movement of all poultry, livestock, and equipment for accurate records.</li> <li>• Provide a location for all individuals to carry out appropriate cleaning and disinfection procedures and insist these measures be followed.</li> <li>• Ensure that housed poultry remain housed and that entry of rodents, ground water, and live birds is prevented.</li> <li>• Prevent close or direct contact between poultry and other species reared outside.</li> </ul>

## 5.9.2 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 and other livestock (from the healthiest possible sources) and those returning from existing flocks or herds for 30 days or more.
- Vaccination status of introduced poultry and other livestock should be known.

### 5.9.3 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 wait the allotted time between premises visits in addition to following appropriate biosecurity and cleaning and disinfection protocols (see [Section 5.15](#)). *Actual waiting periods will be recommended by IC on the basis of the outbreak circumstances, and need for personnel.* Typical waiting times may vary between 24 and 72 hours. Regardless of wait time, team members should not travel 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. However, until further information is available, veterinarians and other responders should adhere to the guidance provided by the local IC.

## 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. Operational staff members need to strictly adhere to movement control procedures, which are based on the best scientific information available at the time.

The Incident Commander, Disease Surveillance Branch (Operations Section), and Situation Unit (Planning Section) will coordinate to establish an IZ and a BZ within 12 hours of the identification of an index case. Controlled movement orders and 24-hour standstill notices are likely to be implemented upon confirmation of HPAI in the United States for relevant premises and zones. ([Appendix H](#) contains examples of movement control notices.) Once the CA (IZ plus BZ) is established, quarantine and movement controls are implemented.

Each State's animal health emergency response plan should describe the implementation of quarantine and movement controls, including a permit system. USDA will impose a Federal quarantine and restrict interstate commerce from the infected States, asking the States (or adjoining countries) to provide resources to maintain and enforce the quarantine. Reimbursement formulas are established between the States and USDA in a cooperative agreement. See *Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0) for further information on authorities and funding.

The following subsections provide information on movement control guidelines and the NAHEMS Guidelines: Quarantine and Movement Control contain more detailed information on movement control.


### 5.10.1 Zones, Areas, and Premises Designations

The Incident Commander will work with the Disease Surveillance Branch (Operations Section) and the Situation Unit (Planning Section) to determine appropriate premises designations in the event of an HPAI outbreak (see [Appendix B](#) for an organizational chart). These zone, area, and premises designations will be used for quarantine and movement control efforts. Again, refer to Tables 5-1 and 5-2 and Figure 5-2 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 5-5 (movement into a CA), Table 5-6 (movement within a CA), and Table 5-7 (movement out of a CA) will be used to issue permits in movement control efforts. For information on permit guidance for eggs and egg products, please refer to the *SES Plan*: [www.secureeggssupply.com](http://www.secureeggssupply.com).

Table 5-5. Movement into Control Area from Outside Control Area to Specific Premises<sup>a</sup>


Item Moving into a Control Area to a/an... 	Infected Premises	Suspect Premises <sup>^</sup>	Contact Premises <sup>^</sup>	At-Risk Premises	Monitored Premises
Poultry <sup>b</sup>	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 for information on susceptible poultry products, or guidance and processes as determined by the IC. Please see <a href="#">Subsection 5.10.3</a> which contains OIE AI-specific guidance for inactivating AI. In addition, <a href="#">Appendix D</a> contains information on the SES Plan for egg and egg product movement during an HPAI outbreak.				
Other animals (non-susceptible) from premises <b>with</b> 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 <b>without</b> 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 <b>with</b> 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.

<sup>a</sup> Movement control and permit processes will change over time depending on situational awareness and operational capabilities.

<sup>b</sup> May include pet birds and other susceptible species as defined by Incident Command during the outbreak.

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

Table 5-6. Movement within a Control Area<sup>a</sup>


Item Moving within a Control Area from a/an.... 	Infected Premises	Suspect Premises <sup>^</sup>	Contact Premises <sup>^</sup>	At-Risk Premises	Monitored Premises
Poultry <sup>b</sup>	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 for information on susceptible poultry products, or guidance and processes as determined by the IC. Please see <a href="#">Subsection 5.10.3</a> which contains OIE AI-specific guidance for inactivating AI. In addition, <a href="#">Appendix D</a> contains information on the SES Plan for egg and egg product movement during an HPAI outbreak.				
Other animals (non-susceptible) from premises <b>with</b> 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 <b>without</b> poultry	n/a (Infected Premises have poultry)	n/a (Suspect Premises have poultry)	n/a (Contact Premises have poultry)	n/a (At-Risk Premises have poultry)	n/a (Monitored Premises have poultry)
Equipment, vehicles, and other fomites from premises <b>with</b> 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.

<sup>a</sup> Movement control and permit processes will change over time depending on situational awareness and operational capabilities.

<sup>b</sup> May include pet birds and other susceptible species as defined by Incident Command during the outbreak.

<sup>^</sup> 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 from Inside a Control Area to Outside a Control Area from Specific Premises<sup>a</sup>

Item Moving out of a Control Area from a/an... 	Infected Premises	Suspect Premises <sup>^</sup>	Contact Premises <sup>^</sup>	At-Risk Premises	Monitored Premises <sup>*</sup>
Poultry	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 for information on susceptible poultry products, or guidance and processes as determined by the IC. Please see <a href="#">Subsection 5.10.3</a> which contains OIE AI-specific guidance for inactivating AI. In addition, <a href="#">Appendix D</a> contains information on the SES Plan for egg and egg product movement during an HPAI outbreak.				
Other animals (non-susceptible) from premises <b>with</b> poultry	Prohibited unless specific permit approved by ICP and appropriate biosecurity measures and risk-assessment.	Prohibited unless specific permit approved by ICP and appropriate biosecurity measures and risk-assessment.	Prohibited unless specific permit approved by ICP and appropriate biosecurity measures and risk-assessment.	Allowed to move by permit approved by ICP; 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 ICP; 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 <b>without</b> poultry	n/a (Infected Premises have poultry)	n/a (Suspect Premises have poultry)	n/a (Contact Premises have poultry)	n/a (At-Risk Premises have poultry)	n/a (Monitored Premises have poultry)
Equipment, vehicles, and other fomites from premises <b>with</b> 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.

<sup>a</sup> Movement control and permit processes will change over time depending on situational awareness and operational capabilities.

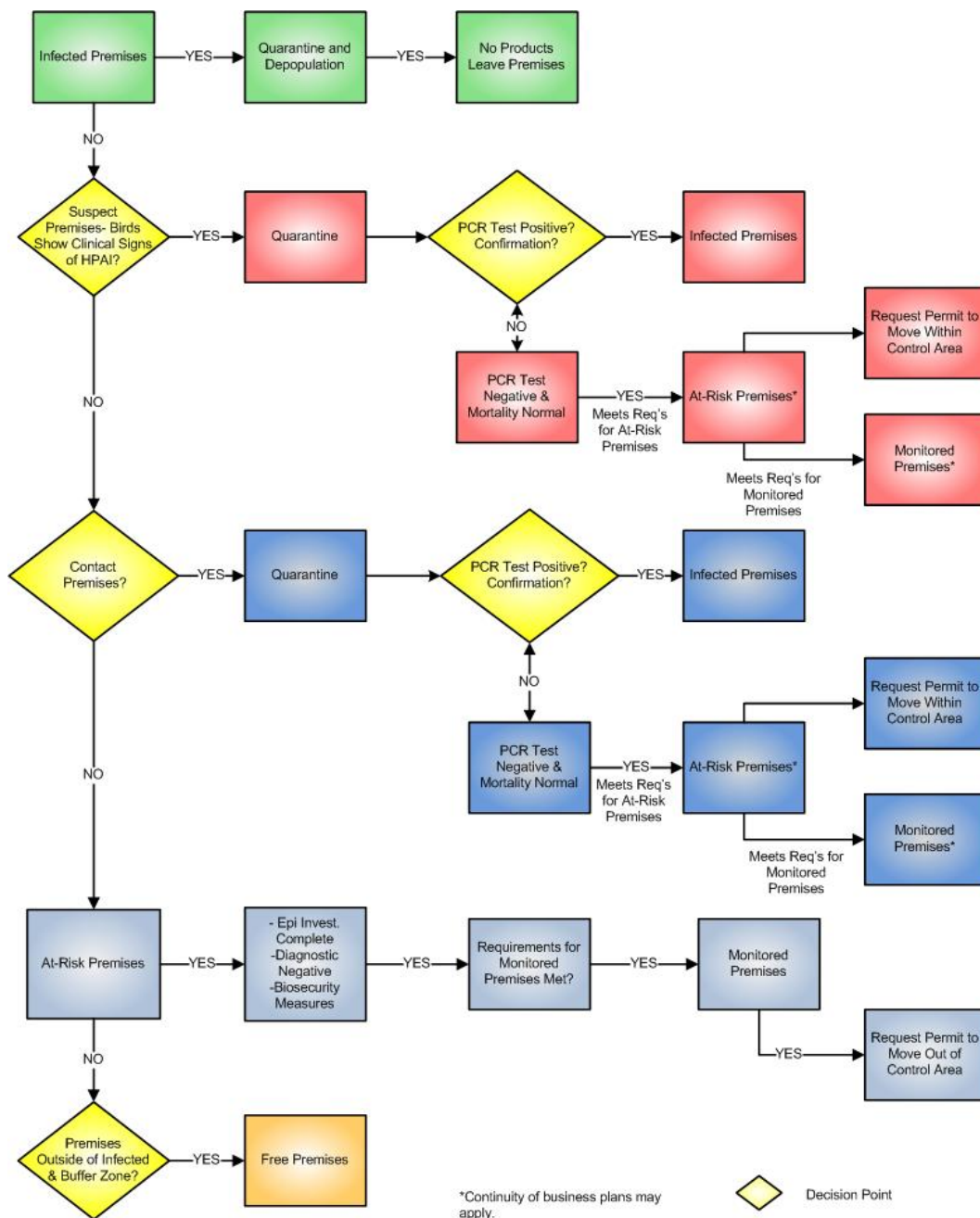
<sup>b</sup> May include pet birds and other susceptible species as defined by Incident Command during the outbreak.

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

<sup>\*</sup> 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 5-3 illustrates premises designations in relation to permitting and movement control.

Figure 5-3. Premises Designations in Relation to Permitting and Movement Control



---

### 5.10.3 OIE Treatment Guidelines for HPAI

The OIE *Terrestrial Animal Health Code* (2012) 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.

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

Table 5-8 lists times for industry standard temperatures suitable for the inactivation of AI virus present in eggs and egg products:

*Table 5-8. 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
Dried egg white	67.0	20 hours
Dried egg white	54.4	513 hours

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.

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

Table 5-9 lists times for industry standard temperatures are suitable for the inactivation of AI virus present in meat.

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.



Table 5-9. 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

#### 5.10.4 Surveillance Required for Poultry and Product Movement

Surveillance measures are required for non-daily 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. For more information on surveillance requirements for non-daily poultry and product movement, see [Appendix E](#) of this plan. The *SES Plan* also contains surveillance measures for daily movement: [www.secureeggssupply.com](http://www.secureeggssupply.com).

### 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. 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.

The *SES Plan* contains additional information about continuity of business (available from [www.secureeggssupply.com](http://www.secureeggssupply.com)), particularly applicable to the interstate movement of eggs and egg products. Additional continuity of business plans are under development, such as the *Secure Turkey Supply*.

---

## 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, that 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.

### 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 (2012)* 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.

The NAHEMS Guidelines: Regionalization for International Trade for a U.S. FAD Response contains information on regionalization as an FAD response tool.

## **5.13 MASS DEPOPULATION AND EUTHANASIA**

Poultry on an IP will be depopulated as soon as possible after declaration of an HPAI outbreak. Poultry on CP may also be depopulated as soon as possible after the premises are classified as CP. The Mass Depopulation and Euthanasia SOP provides instructions for personnel following the declaration of an HPAI outbreak and the classification of IP and CP. This SOP offers HPAI-specific information on mass depopulation and euthanasia for poultry, including evaluation of various euthanasia methods, such as

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

The NAHEMS Guidelines: Mass Depopulation and Euthanasia contains additional information on euthanasia and mass depopulation.

### **5.13.1 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 response to prevent or mitigate the spread of HPAI through elimination of infected or potentially infected animals. Best practice guidance issued in 2007 from the American Veterinary Medical Association (AVMA) states that “Under unusual conditions, such as disease eradication and natural disasters, euthanasia options may be limited. In these situations, the most appropriate technique that minimizes human and animal health concerns must be used.” Qualified personnel should perform mass depopulation in the event of an HPAI outbreak using the safest, quickest, and most humane procedure in accordance with AVMA guidance.

If personnel or materials are insufficient, the Incident Commander or other official should request emergency depopulation, disposal, and decontamination (3D) contractor support for HPAI depopulation efforts from the NVS.

---

### 5.13.2 Water-Based Foam for Poultry Depopulation

AVMA supports the use of water-based (fire suppression) foam as a method of mass depopulation for poultry under emergency conditions, if performance standards are implemented as detailed by APHIS. This method is superior in that fewer personnel are required to enter into poultry houses. However the equipment required may be expensive and large amounts of water are required, depending on the foaming system. Water-based foam has been approved for poultry depopulation of the following groups:

- ◆ Floor-reared poultry (broiler chickens and turkeys);
- ◆ Poultry infected with HPAI, a potentially zoonotic disease;
- ◆ Animals experiencing an outbreak that is rapidly spreading and, in the opinion of State or Federal regulatory officials, cannot be contained by conventional or currently accepted means of depopulation; and
- ◆ Animals housed in structurally unsound buildings that would be hazardous for human entry.

The Mass Depopulation and Euthanasia SOP provides additional information on using water-based foam for poultry depopulation in an attachment.

## 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 will occur as soon as possible after flock depopulation.

There are multiple options for disposal. On-site burial may be an inexpensive and biosecure method of disposal that minimizes the transportation of infected materials. However, off-site burial may be needed when on-site burial is not possible or when a number of IP must be depopulated and a common burial site would be more efficient. Other disposal methods such as composting, incineration, digestion, and rendering may also be employed, 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.

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 will coordinate 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 NVS. The NAHEMS Guidelines: Disposal contains further guidance on disposal.

## 5.15 CLEANING AND DISINFECTION

Because of HPAI's high survival rate on both organic and inorganic materials, aggressive cleaning and disinfection practices are required for control and eradication. Cleaning and disinfection are to be conducted within 48 hours of the disposal of depopulated poultry. The HPAI 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
- ◆ Environmental Protection Agency (EPA)-approved disinfectants for HPAI.

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. All disinfectants must be EPA-approved for AI; off-label use of disinfectants is illegal.

If available personnel or materials are insufficient for cleaning and disinfection in an HPAI outbreak, the Incident Commander can request emergency 3D contractor support from NVS.

The NAHEMS Guidelines: Cleaning and Disinfection contains additional information on cleaning and disinfection.

---

## 5.16 VACCINATION

### 5.16.1 Emergency Vaccination Strategies for Poultry

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. 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 I](#) contains information on available vaccine and vaccination protocols for HPAI. The NAHEMS Guidelines: Vaccination for Contagious Diseases (Appendix C: Vaccination for high pathogenicity avian influenza) contains more information.

### 5.16.2 Differentiation of Infected and Vaccinated Animals and Surveillance of Vaccinated Flocks

Emergency vaccination requires vaccinated animal traceability and the diagnostic capability to differentiate infected from vaccinated animals (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 employs

- ◆ 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

IC and, if needed, Federal, State, and other advisors will evaluate whether to vaccinate if vaccine has been requested. 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.

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

[http://www.aphis.usda.gov/animal\\_health/vet\\_biologics/publications/memo\\_800\\_85.pdf](http://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: <http://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;

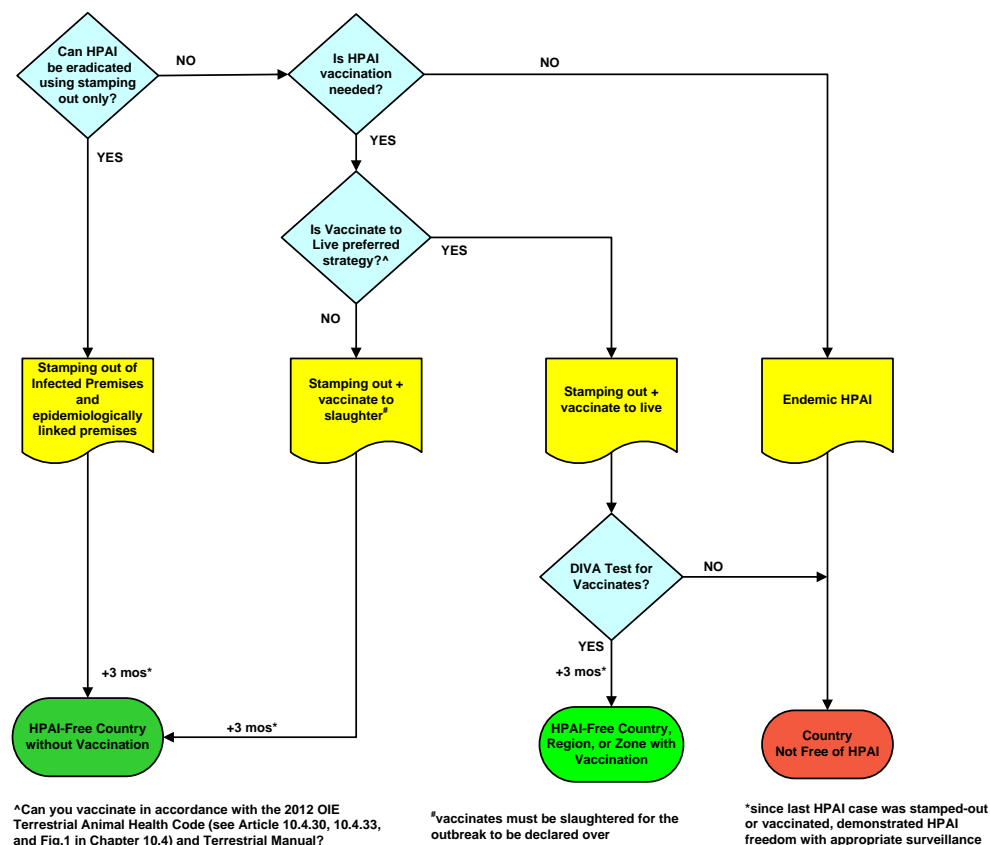
- ◆ Increased risk of introduction due to the presence of HPAI in neighboring countries;
- ◆ The extent to which disease is found in waterfowl, other wild birds, backyard flocks, or in live bird markets;
- ◆ Availability of physical and human resources;
- ◆ Sociopolitical factors (public confidence in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

Figure 5-4 shows the decision tree for emergency vaccine use in domestic poultry in the event of an HPAI outbreak.

*Figure 5-4. 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).

The following are the bird classes in order of vaccination priority:

1. Valuable genetic poultry, breeding stock such as grandparent and parent breeders.
2. Long-lived poultry, such as layers.
3. High-risk situations, such as ring vaccination around HPAI-infected birds.
4. Rare, endangered, genetically valuable captive birds such as zoo birds.
5. Backyard birds.
6. Commercial ducks.
7. Broilers, meat production poultry, and turkeys.

## 5.16.5 Vaccination Zone Designations

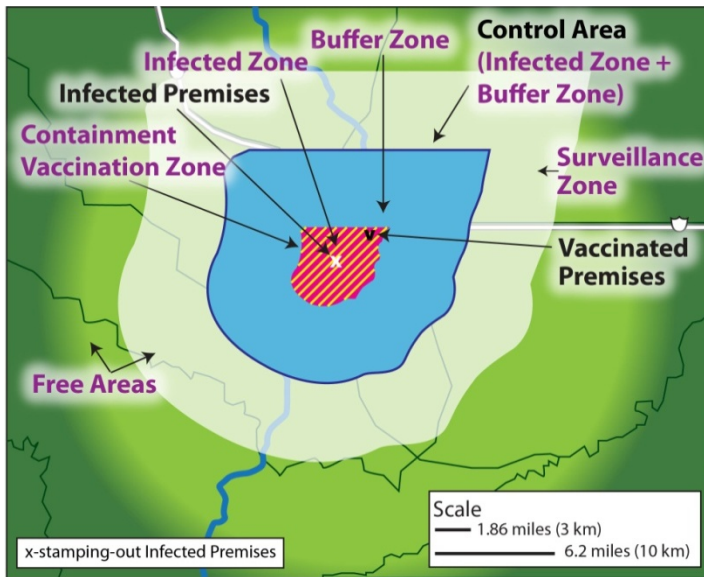
The following sections present illustrations of the VZ designations.

### 5.16.5.1 CONTAINMENT VACCINATION ZONE

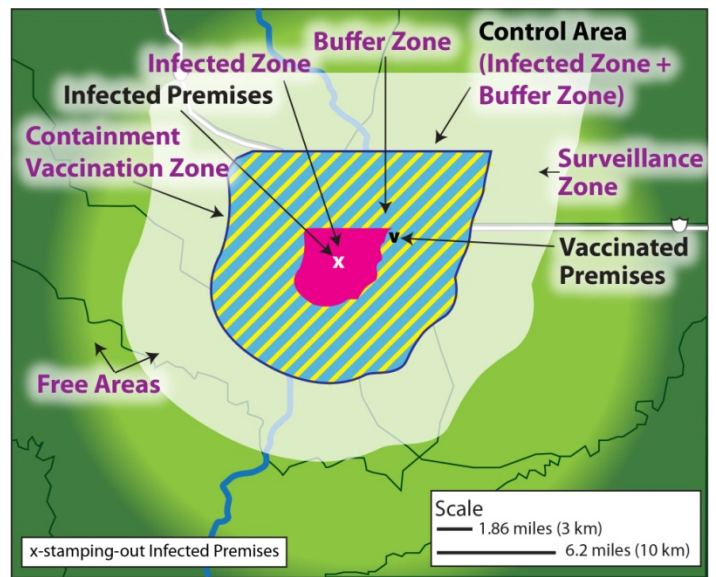
The CVZ is an emergency vaccination zone typically inside the CA, and may include the IZ or the BZ. A CVZ is typically observed with stamping-out modified with emergency vaccination to kill. Figure 5-5 shows examples of CVZs.

Figure 5-5. Examples of Containment Vaccination Zones

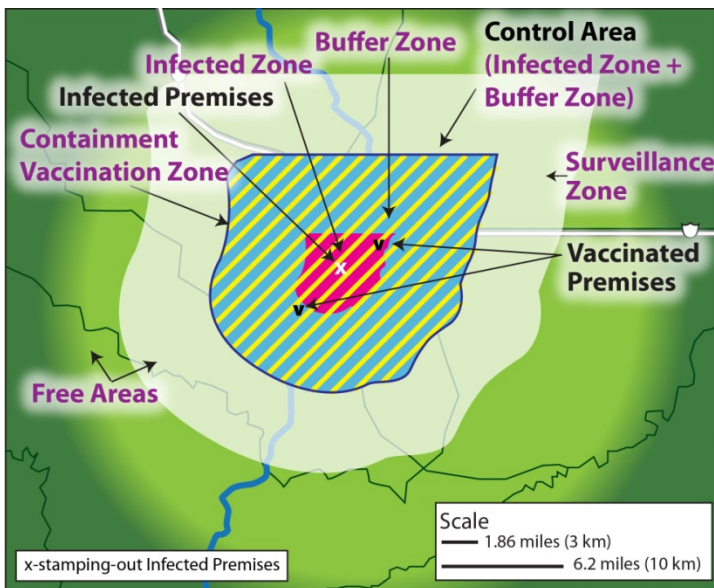
Emergency Vaccination in IZ



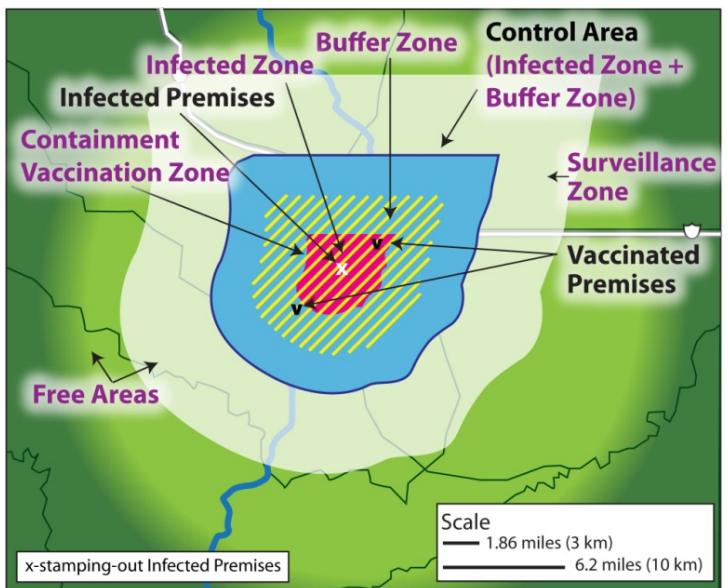
Emergency Vaccination in BZ



Emergency Vaccination in CA



Emergency Vaccination in IZ and Partial BZ



Infected Zone
  Buffer Zone
  Vaccination Zone
  Surveillance Zone

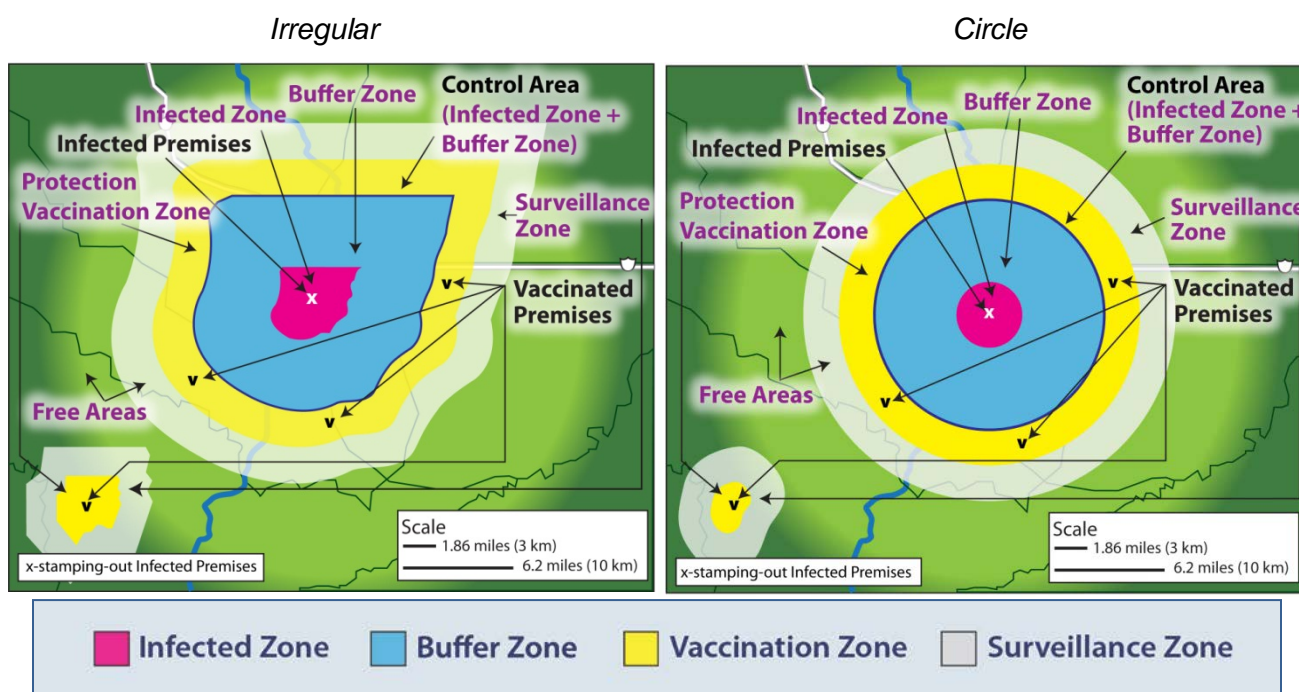
### 5.16.5.2 PROTECTION VACCINATION ZONE

The PVZ is an emergency vaccination zone typically outside the CA. It is consistent with the OIE *Terrestrial Animal Health Code (2012)* 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 5-6 shows examples of PVZs.

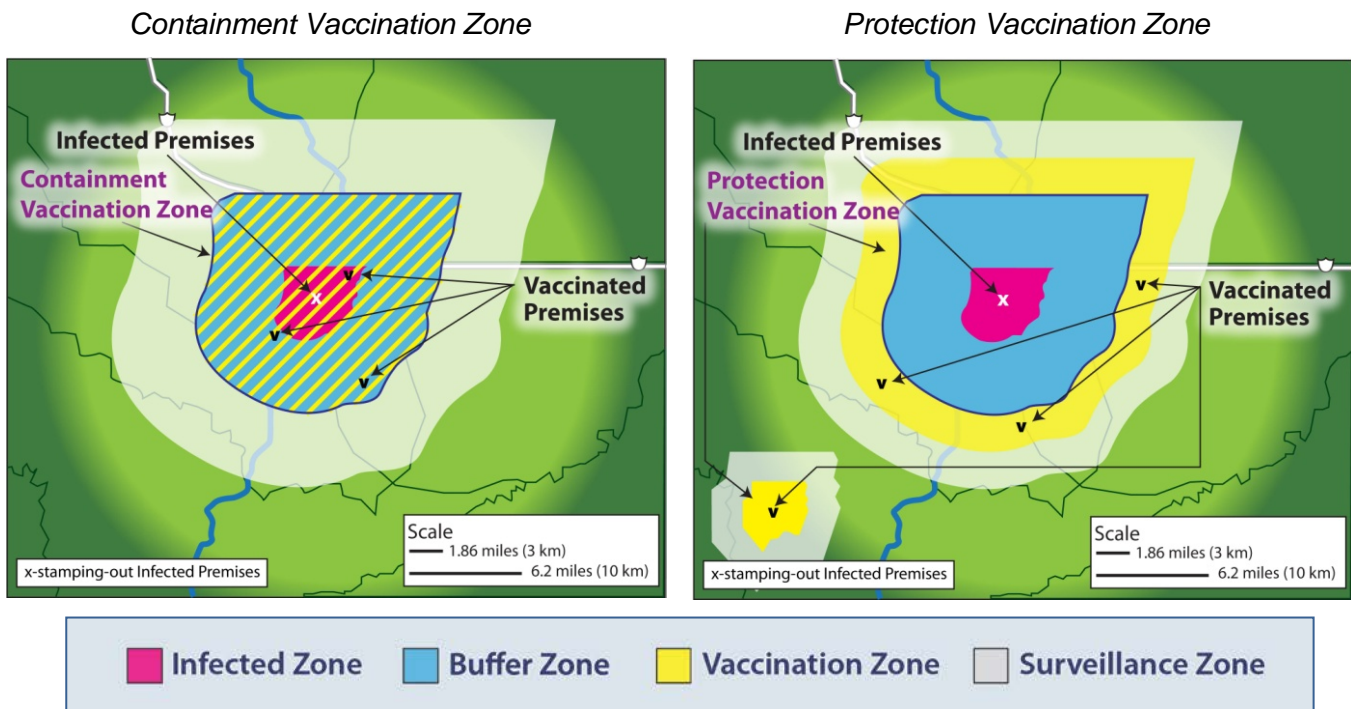
Figure 5-6. Examples of Protection Vaccination Zones



### 5.16.6 Vaccinated Premises

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 5-7 shows VP in a CVZ (left) and a PVZ (right).

Figure 5-7. 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.

### 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. No new vaccinations can be given more than 42 days after the last known new case of HPAI is detected.

## 5.17 NATIONAL VETERINARY STOCKPILE

The Overview of the NVS SOP provides information on NVS capabilities and lays out the required steps to request countermeasures 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
- ◆ outreach and exercise programs.

During an HPAI outbreak, the goal of the NVS is to deliver the amount of requested animal vaccine, antiviral, or therapeutic products to respond within 24 hours of outbreak confirmation.

The NVS also has contractor support for 3D activities, which can be requested through the IC. The surge response capacity of 3D commercial responders is a response to the site within 24 hours, 500 – 600 people within 72 hours, and 1,000 people within a week.

## 5.18 WILDLIFE MANAGEMENT AND VECTOR CONTROL

USDA APHIS will work 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 will occur in both the Unified Command as well as in MAC Groups.

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

### 5.18.1 Wildlife Management

A wildlife management plan that addresses transmission of HPAI in wildlife will be developed as soon as possible after identification of the index case in domestic poultry to prevent the exposure of wild birds to poultry and other livestock. An assessment of the risk that wildlife poses for HPAI transmission to susceptible birds, poultry, and other animals will be conducted within 7 days of confirmation of the index case.

---

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.

Importantly, HPAI in wild birds does not impact OIE HPNAI-free status. As stated in the OIE *Terrestrial Animal Health Code (2012)*, in Article 10.4.1,

A Member should not impose immediate bans on the trade in poultry commodities in response to a notification, according to Article 1.1.3, of the Terrestrial Code, of infection with HPAI and LPAI 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.

## 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 destruction or vaccination activities until they are depopulated, euthanized, or slaughtered, 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 assessment are critical in a successful HPAI response. These tools give decision makers valuable insight. During an outbreak, one or more multidisciplinary teams (consisting of epidemiologists, disease agent experts, economists, affected commodity experts, and others) will be established to perform risk assessments as needed. An appropriate, scientific risk assessment on an issue of concern will be provided within 72 hours after a request from the Incident Commander.

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. Fair market value appraisal should be provided to owners of destroyed poultry and materials within 12 – 72 hours after the destruction of said poultry and materials. The HPAI Appraisal and Compensation SOP focuses on specifying personnel responsibilities, appraisal procedures, assessment of compensation eligibility, payment of indemnity, and required forms and reports during an HPAI outbreak.

The AHPA gives APHIS authority to establish and implement an indemnification program to prevent or eradicate an HPAI outbreak. 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 an HPAI outbreak, ordering the destruction of poultry on premises that are epidemiologically linked to an IP may be necessary to ensure that the 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 will only be paid in cases where State and Federal animal health authorities concur with the recommendations to order the destruction of poultry, whether those recommendations emerged from industry, State, or Federal authorities.

The best practices for containment and eradication of HPAI will in many instances require 3D faster than can be achieved with slow or deliberate appraisal processes. Appraisals will not be required to be signed prior to destruction if APHIS and the cooperating State agree that the poultry must be destroyed immediately to mitigate the potential spread or amplification of HPAI virus during a response to a confirmed or presumptive HPAI incident. All data required to determine fair market value will be collected prior to depopulation, including a complete inventory of poultry being destroyed.

APHIS has published a rule in the CFR increasing indemnity for H5/H7 LPAI viruses. Parts 56 and 146 were added to Title 9 of the CFR. Part 56 deals with indemnity payments for H5/H7 LPAI. In 9 CFR 56.8, Conditions for Payment, a formula is described for distributing indemnity between owners and growers.<sup>1</sup> Indemnity distribution between owners and growers will follow this formula. These CFR sections also apply to H5/H7 HPAI. In addition, 9 CFR 53 describes

---

<sup>1</sup> Title 9 CFR Chapter 1, Part 56,  
[http://www.access.gpo.gov/nara/cfr/waisidx\\_10/9cfr56\\_10.html](http://www.access.gpo.gov/nara/cfr/waisidx_10/9cfr56_10.html).

---

policies for providing indemnity to an owner of animals or materials requiring destruction.<sup>2</sup>

For additional resources and guidance on appraisal and compensation please see APHIS's Livestock Appraisal, Indemnity, and Compensation Website: [http://www.aphis.usda.gov/animal\\_health/emergingissues/compensation/comp.shtml](http://www.aphis.usda.gov/animal_health/emergingissues/compensation/comp.shtml).

## 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 Commodity Credit Corporation (CCC) and the APHIS Contingency Fund (CF).

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 will consider the total estimated amount of funding needed to address the issue and whether the program has political support before deciding whether or not to seek a CCC transfer.

APHIS CF takes care of unforeseen, unpredictable 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.

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.

---

<sup>2</sup> Title 9 CFR Chapter 1, Part 53,  
[http://www.access.gpo.gov/nara/cfr/waisidx\\_10/9cfr53\\_10.html](http://www.access.gpo.gov/nara/cfr/waisidx_10/9cfr53_10.html).



## 5.23 NATIONAL RESPONSE FRAMEWORK AND NATIONAL INCIDENT MANAGEMENT SYSTEM

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 for APHIS employees at <http://inside.aphis.usda.gov/vs/em/fadprep.shtml>. For others, please go to <https://fadprep.lmi.org>.

# 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 NAI-freedom or HPNAI-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 NAI and HPNAI. 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 NAI or HPNAI. 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 NAI-FREE STATUS

The OIE defines an NAI-free country, zone, or compartment as follows:

A country, zone, or compartment may be considered free from NAI when it has been shown that neither HPNAI nor LPNAI infection in poultry has 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, NAI free status can be regained:

1. In the case of HPNAI infections, 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 LPNAI infections, 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 and 10.4.33 has been carried out during the three-month period.

---

### 6.1.1.2 CRITERIA NEEDED FOR HPNAI-FREE STATUS

The OIE defines an HPNAI-free country, zone, or compartment as follows:

A country, zone, or compartment may be considered free from HPNAI when

1. it has been shown that HPNAI infection in poultry has not been present in the country, zone, or compartment for the past 12 months, although its LPNAI status may be unknown; or
2. when, based on surveillance in accordance with Articles 10.4.27 and 10.4.33, it does not meet the criteria for freedom from NAI, but any NAI virus detected has not been identified as HPNAI 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, HPNAI 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 and 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 HPNAI 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 (2012)*. Surveillance schemes could also be intensified in conjunction with CA surveillance by

- ◆ increasing the use of sentinel flocks;
- ◆ 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; and

- ◆ increasing slaughter sampling (sero-surveillance).

Appendix E 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 (2012)* provide information on surveillance strategies and the documentation of NAI or HPNAI status, respectively. Please see the AI Surveillance Plan and AI Clean Program through NPIP (9 CFR 145) for additional information on surveillance for DF.

#### 6.1.2.1 SPECIFIC OIE SURVEILLANCE GUIDANCE FOR COUNTRIES REGAINING FREEDOM

Specifically for countries that are regaining freedom from NAI or HPNAI after an outbreak, the OIE states in Article 10.4.31:

In addition to the general conditions detected in the above-mentioned articles, a Member declaring that it has regained country, zone or compartment freedom from NAI or HPNAI virus infectious 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 described in the *Terrestrial Manual*. The use of sentinel birds may facilitate the interpretation of surveillance results.

A Member declaring freedom of country, zone or compartment after an outbreak of NAI or HPNAI (with or without vaccination) should report the results of an active surveillance program in which the NAI or HPNAI susceptible poultry population undergoes regular clinical examination and active surveillance planned and implemented according to 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.

#### 6.1.3 Release of Control Area Restrictions

Quarantine and movement control restrictions are maintained until at least 21 days have elapsed since the decontamination of all confirmed IP and negative results of surveillance activities. IC and animal health officials need to plan for a release of quarantine prior to or during the issuance of quarantine and movement controls. Such a plan would specify procedures by which quarantined premises are evaluated for HPAI freedom and how the quarantine is released (by sections, by risk, or in its 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. HPNAI-free status requires formal submission detailing the HPNAI 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 HPNAI freedom.

# 6.2 REPOPULATION

## 6.2.1 Restocking Guidance

Following official approval of cleaning and disinfection procedures, IP will remain vacant for a minimum of 21 days to ensure that any residual virus has been eliminated. This period may be decreased if external heat is used to raise the temperature of the houses sufficiently to inactivate any residual virus in a shorter period.

## 6.2.2 Testing Requirements for Restocking

Birds placed into previously infected houses or premises are subjected to weekly statistically valid testing by rRT-PCR for the presence of AI virus. The last test will be conducted at least 21 days after the birds are placed in the house:

- ◆ If the houses are left vacant for a period of 60 days after cleaning and disinfection is approved, there are no testing requirements.
- ◆ In the event that part of the premises has not been cleaned and decontaminated (for example, uncleanable buildings), such premises may be partially approved if these uncleanable areas are fenced in a manner to prevent access by people, birds, or equipment. If complete cleaning and disinfection procedures still are not possible due to such conditions, restocking may take place after a 120-day fallow period. In such cases, these buildings should be repaired or destroyed.
- ◆ Environmental conditions should be considered in restocking premises.
- ◆ Restocking can take place before the end of the outbreak, under conditions established by the IC.

### 6.2.3 Approved Sources of Poultry

Source flocks for all introduced poultry must test negative through rRT-PCR and other diagnostics, as determined by IC. A 24-hour pre-movement clinical inspection is also required.

# Appendix A

## FAD PReP Materials to Support HPAI Response

---

This appendix lists the Foreign Animal Disease Preparedness and Response Plan (FAD PReP) documents that directly support this *Highly Pathogenic Avian Influenza (HPAI) Response Plan (2012)*, and also provides an overview of the goals and mission of FAD PReP. The new and revised documents listed below will be useful in preparedness and response efforts related to HPAI and poultry. Many of these documents have been released; others are forthcoming. These resources are found online at <https://fadprep.lmi.org>, and also on for Animal and Plant Health Inspection Service (APHIS) employees at <http://inside.aphis.usda.gov/vs/em/fadprep.shtml>. Selected resources are also available at [http://www.aphis.usda.gov/animal\\_health/emergency\\_management](http://www.aphis.usda.gov/animal_health/emergency_management).

## HPAI CONTINUITY OF BUSINESS PLANNING

Secure Egg Supply Plan

## HPAI STANDARD OPERATING PROCEDURES (SOPs)—CRITICAL ACTIVITIES

These documents are templates to provide a common picture or set of procedures for the following tools and strategies used in HPAI response:

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. Overview of the National Veterinary Stockpile
  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 the National Response Framework and National Incident Management System.

## INDUSTRY MANUAL

Poultry (In Progress)

## NATIONAL ANIMAL HEALTH EMERGENCY MANAGEMENT SYSTEM (NAHEMS) GUIDELINES

- ◆ Health and Safety
- ◆ Personal Protective Equipment
- ◆ Biosecurity
- ◆ Quarantine and Movement Control
- ◆ Mass Depopulation and Euthanasia
- ◆ Disposal



- ◆ Cleaning and Disinfection
- ◆ Vaccination for Contagious Diseases
- ◆ Wildlife Management and Vector Control for an FAD Response in Domestic Livestock
- ◆ Appraisal and Compensation
- ◆ National Animal Health Emergency Response Corp (NAHERC) Deployment Guide
- ◆ Surveillance, Epidemiology, and Tracing
- ◆ Regionalization for International Trade for a U.S. Foreign Animal Disease Response
- ◆ Continuity of Business

## 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)
- ◆ NCAHEM (National Center for Animal Health Emergency Management) Stakeholder Coordination and Collaboration Resource Guide
- ◆ NCAHEM Incident Coordination Group Plan

## OVERVIEW OF FAD PReP

### FAD PReP Mission and Goals

The significant threat and potential consequences of FADs and the challenges and lessons-learned of effective and rapid FAD response have led to the development of the Foreign Animal Disease Preparedness and Response Plan, also known as “FAD PReP.” The mission of FAD PReP is to raise awareness, expectations, and develop capabilities surrounding FAD preparedness and response. The goal of FAD PReP is to integrate, synchronize, and de-conflict 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 protect public health*; and (3) *provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products*.

## FAD PReP Documents and Materials

FAD PReP is a comprehensive U.S. preparedness and response strategy for FAD threats. This strategy is provided and explained in a series of different types of integrated documents, as illustrated below.

Figure A-1. FAD PReP Suite of Documents and Materials



## Lessons Learned from Past Outbreaks

Past outbreaks both in the United States and other countries offer important lessons that can be applied to preparedness and response efforts. To achieve successful outcomes in future FAD response, it is vital to identify, understand, and apply these lessons learned:

- ◆ Provide a unified State-Federal-Tribal-industry planning process that respects local knowledge.
- ◆ Ensure the Unified Command sets clearly defined, obtainable, and unified goals.
- ◆ Have a Unified Command with a clear and proper delegation of authority and that acts with speed and certainty.

- ◆ Employ science-based and risk-management approaches that protect public health and animal health, protect animal agriculture, the stabilize the food supply and the U.S. economy.
- ◆ Ensure guidelines, strategies, and procedures are communicated to, and understood by responders and stakeholders.
- ◆ Acknowledge that high expectations for timely and successful outcomes require the
  - rapid scale-up of resources and trained personnel for veterinary activities and countermeasures, and
  - capability to quickly address competing interests before or during an outbreak.
- ◆ Ensure rapid detection and effective FAD tracing, essential for the timely control of FAD outbreaks.

## Appendix B

# Incident Management

---

This appendix contains Chapter 5 from the *APHIS [Animal and Plant Health Inspection Service] Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0) document. This chapter explains incident management in the event of a highly pathogenic avian influenza outbreak. Please refer to the *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0) and the *NCAHEM [National Center for Animal Health Emergency Management] Incident Coordination Group Plan* for more information (available at <https://fadprep.lmi.org> and [http://www.aphis.usda.gov/animal\\_health/emergency\\_management](http://www.aphis.usda.gov/animal_health/emergency_management)).

---

Homeland Security Presidential Directive-5, Management of Domestic Incidents, directed the development and administration of the National Incident Management System (NIMS). NIMS, in conjunction with the National Response Framework, provides the template for managing incidents and provides the structure and mechanisms for national-level policy for incident management. NIMS provides a systematic, proactive approach to guide departments and agencies at all levels of government, non-governmental organizations (NGOs), and the private sector to prevent, mitigate, respond to, and recover from the effects of incidents, regardless of cause, size, location, or complexity, in order to reduce the loss of life and property and harm to the environment.

A basic premise of NIMS is that all incidents begin and end locally. NIMS does not take command away from State and local authorities. NIMS simply provides the framework to enhance the ability of responders, including the private sector and NGOs, to work together more effectively. The Federal Government supports State and local authorities when their resources are overwhelmed or anticipated to be overwhelmed.

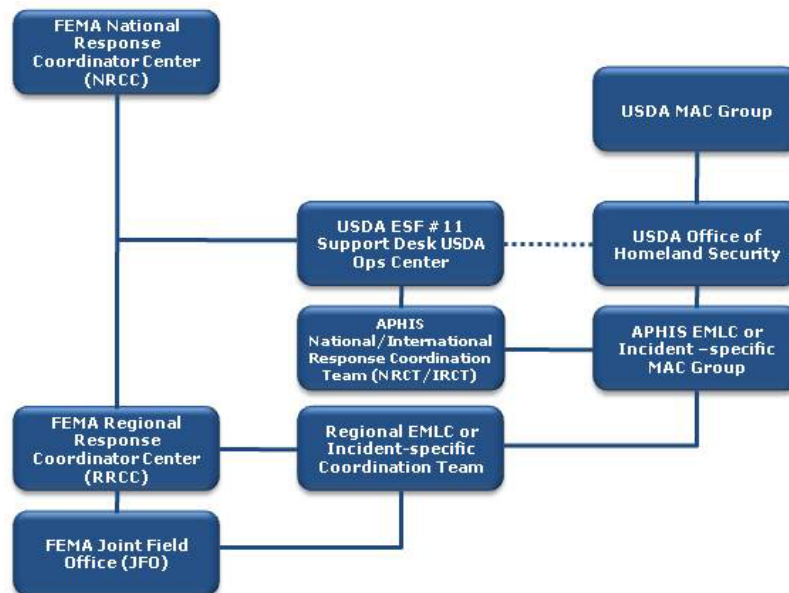
Incident Command System (ICS) is a management system designed to enable effective and efficient domestic incident management by integrating a combination of facilities, equipment, personnel, procedures, and communication within a common organizational structure. APHIS has adopted NIMS and ICS organizational structures and processes to manage animal health incidents. Additional information on NIMS can be found at: <http://www.fema.gov/emergency/nims/>. Additional information on ICS can be found at: <http://training.fema.gov/EMIWeb/IS/ICSResource/index.htm>.

APHIS policy and procedures for APHIS Emergency Responder positions and APHIS Specialized Emergency Responder positions are described in the *APHIS Emergency Response Qualification Process* and *APHIS Emergency Responder Position Catalog*.<sup>1</sup> APHIS employees can find these documents at: [http://inside.aphis.usda.gov/emergency\\_info/organization/resp\\_cat.shtml](http://inside.aphis.usda.gov/emergency_info/organization/resp_cat.shtml).

## MULTIAGENCY COORDINATION

Multiagency coordination (MAC) is a process that allows all levels of government and all disciplines to work together more efficiently and effectively. MAC occurs across the different disciplines involved in incident management, across jurisdictional lines, or across levels of government. The *APHIS Emergency Mobilization Guide* defines APHIS coordination for major agricultural disasters and agro-terrorism responses (see Figure B-1). In the event of an animal emergency an APHIS MAC Group will be formed if the incident response needs more support. Fundamentally, the APHIS MAC Group will provide support, coordination, and assistance with policy-level decisions to the ICS structure managing an incident.

Figure B-1. Coordination Structures: U.S. Department of Agriculture and Department of Homeland Security/Federal Emergency Management Agency<sup>2</sup>



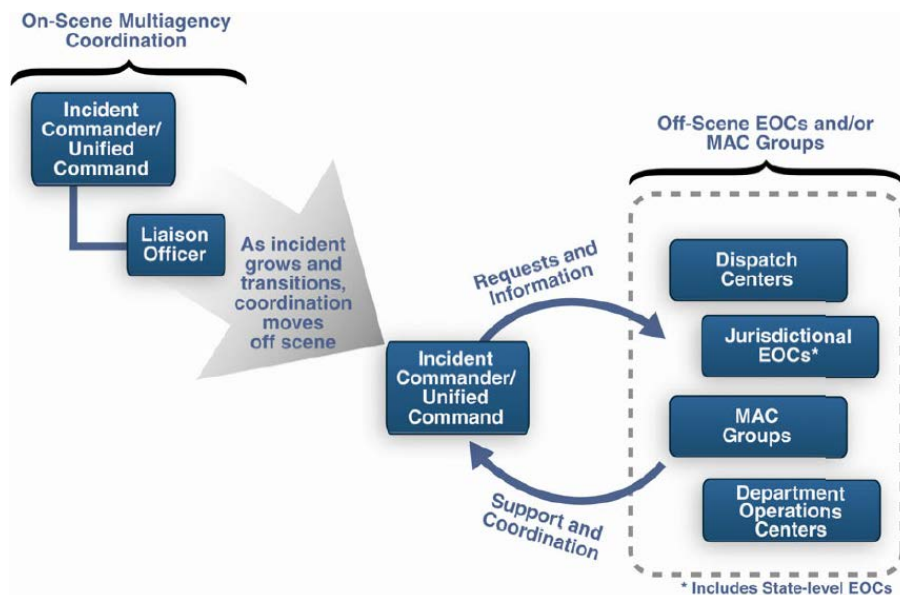
Note: EMLC=Emergency Management Leadership Council, ESF=Emergency Support Function

<sup>1</sup> Information on USDA policies and procedures can be found in Departmental Manual #1900-001. Incident Preparedness, Response, and Recovery. November 2011; and Departmental Regulation #1800-001. Incident Preparedness, Response and Recovery. November 2011.

<sup>2</sup> USDA APHIS, 2009. *Emergency Mobilization Guide*.

Figure B-2 illustrates an overview of a MAC system according to NIMS. The figure shows the transition over the course of an incident. The incident begins with an on-scene single Incident Command (IC); as the incident expands in size or complexity developing into a Unified Command, the incident may require off-scene coordination and support, which is when MAC Groups are activated.

Figure B-2. Multiagency Coordination System<sup>3</sup>



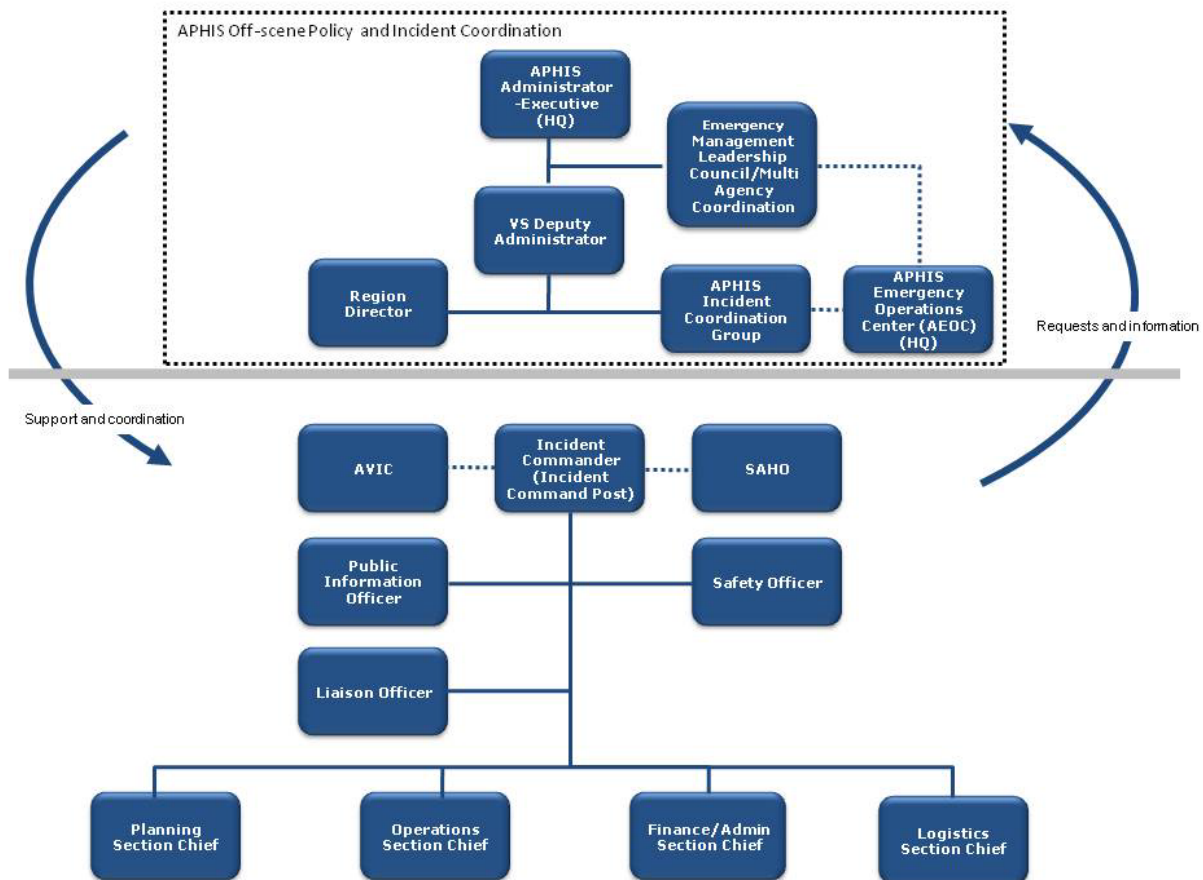
Note: EOC=Emergency Operations Center

## APHIS INCIDENT MANAGEMENT STRUCTURE

Figure B-3 displays the APHIS foreign animal disease (FAD) incident management organizational structure, starting with the APHIS Administrator.

<sup>3</sup> Federal Emergency Management Agency (FEMA), 2008. *National Incident Management System*. [http://www.fema.gov/pdf/emergency/nims/NIMS\\_core.pdf](http://www.fema.gov/pdf/emergency/nims/NIMS_core.pdf).

*Figure B-3. APHIS MAC Structures and APHIS Emergency Operations Center: Relationship to Incident Management Team  
(Assuming a Single Incident)*



Note: SAHO=State Animal Health Official, AVIC=Area Veterinarian in Charge

The APHIS Administrator is the primary Federal executive responsible for implementing APHIS policy during an FAD outbreak. The APHIS Administrator will delegate many of the actual MAC functions to the Veterinary Services (VS) Deputy Administrator (Chief Veterinary Officer of the United States) and the APHIS Emergency Management Leadership Council (EMLC).

The VS Deputy Administrator and the EMLC will establish an APHIS Incident Coordination Group (ICG) to oversee the staff functions associated with the incident at the APHIS headquarters level. The APHIS ICG will work closely with the personnel in charge of establishing operations for the incident response at the Area Command (AC) or Incident Command Post (ICP) in the field and coordinate with the APHIS MAC Group.

## APHIS MULTIAGENCY COORDINATION GROUP

In the event of a significant FAD emergency, the EMLC typically serves as the APHIS MAC Group, unless it transfers responsibility for a specific incident. The EMLC is co-chaired by Plant Protection and Quarantine's Associate Director, Emergency and Domestic Programs and VS' Associate Deputy Administrator, Emergency Management and Diagnostics. The EMLC is comprised of the following headquarters and regional members:

- ◆ Plant Protection and Quarantine,
- ◆ VS,
- ◆ Animal Care,
- ◆ Wildlife Services,
- ◆ International Services,
- ◆ Biotechnology Regulatory Services,
- ◆ Marketing and Regulatory Programs Business Services,
- ◆ Legislative and Public Affairs,
- ◆ Policy and Program Development,
- ◆ Investigative Enforcement Services,
- ◆ Emergency Management and Safety and Security Division, and
- ◆ APHIS Chief Information Officer.

The APHIS MAC Group may include additional members if the response requires and may be activated if one or more of the following conditions take place:

- ◆ Complex incidents that overwhelm local and regional assets;
- ◆ Overlapping USDA agency jurisdictions;
- ◆ An incident that crosses international borders; or
- ◆ The existence of or potential for a high level of national political and media interest.

The APHIS MAC Group provides a forum to discuss actions that need to be taken to ensure that an adequate number of resources are available to meet anticipated



---

needs. The APHIS MAC Group strategically coordinates the incident response, but does not typically direct the APHIS ICG.

The APHIS MAC Group offers guidance on the most efficient way to allocate resources during an animal health event. Specific responsibilities vary from disease to disease, but the general functions of the APHIS MAC Group include

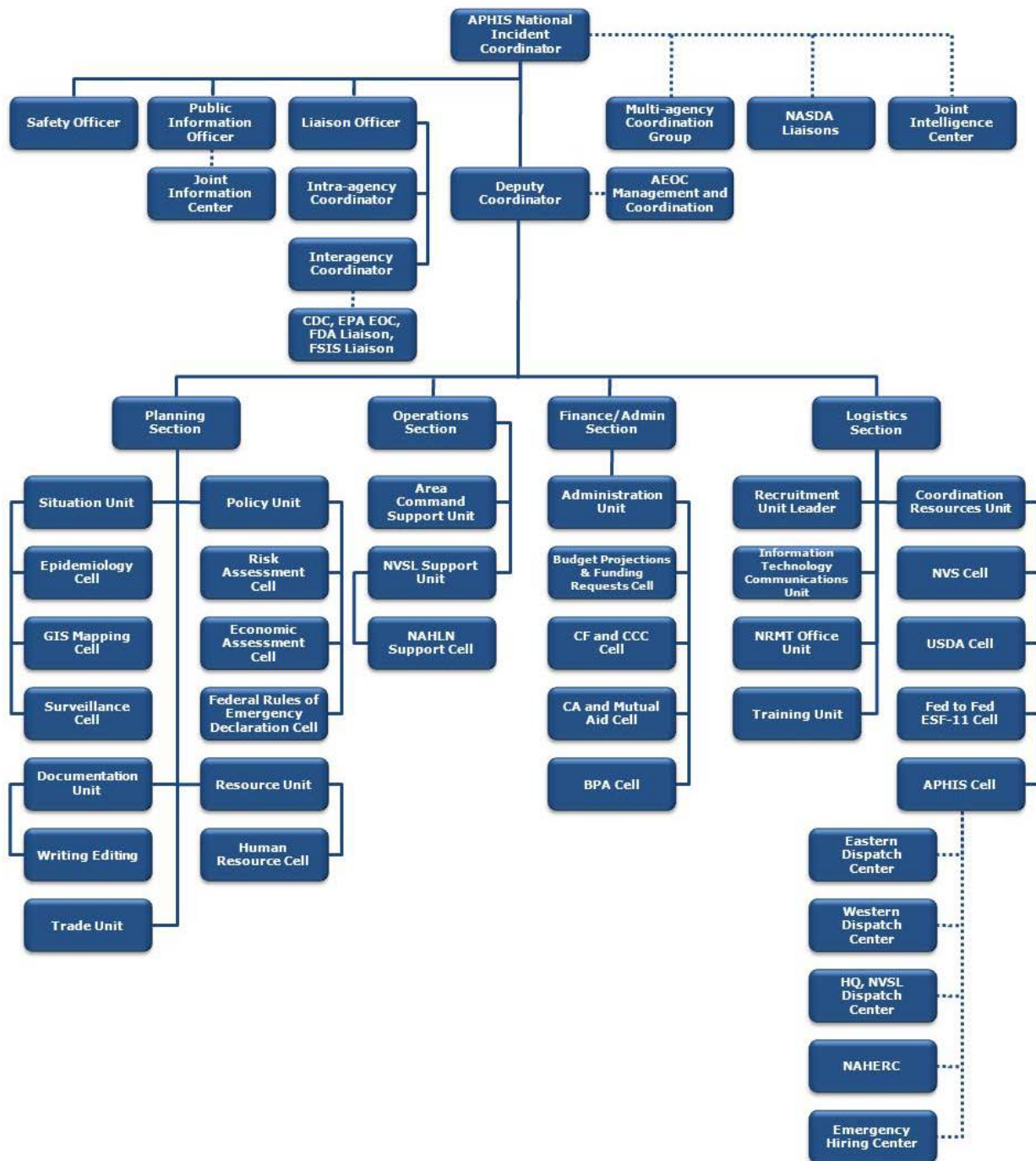
- ◆ incident prioritization,
- ◆ resource allocation and acquisition, and
- ◆ identification and resolution of issues common to all parties.

## APHIS INCIDENT COORDINATION GROUP

The APHIS ICG is responsible for supporting an ICP and AC in acquiring resources, formulating policy options, and assisting in developing and implementing response and recovery strategies for FAD outbreaks. For additional information and details, see the *NCAHEM Incident Coordination Group Plan*. Figure B-4 illustrates an example organizational chart for an APHIS ICG. The group has the following responsibilities:

- ◆ Providing guidelines to ensure responder and public health and safety;
- ◆ Supporting ICP(s) and AC(s);
- ◆ Assisting in developing response policy as needed;
- ◆ Coordinating effective communication;
- ◆ Coordinating resources;
- ◆ Assisting in establishing epidemiological priorities;
- ◆ Assisting in developing incident objectives and approving response strategies for emergency vaccination as needed;
- ◆ Assisting in integrating response organizations into the ICS;
- ◆ Assisting in developing protocols as needed;
- ◆ Providing information to the Joint Information Center for use in media and stakeholder briefings;
- ◆ Providing budget requests and projections as needed; and
- ◆ Assessing response progress, response strategies, and providing economic analyses as needed.

Figure B-4. Example APHIS Incident Coordination Group—Organizational Structure  
(for Foreign Animal Disease Outbreak)



Note: SAHO=State Animal Health Official, CDC=Centers for Disease Control, EPA=Environmental Protection Agency, EOC=Emergency Operations Center, FDA=Food and Drug Administration, FSIS=Food Safety Inspection Service, AEOC=APHIS Emergency Operations Center, NASDA=National Association of State Departments of Agriculture, GIS=Geographic Information System, NVSL=National Veterinary Services Laboratories, NAHLN=National Animal Health Laboratory Network, CF=Contingency Fund, CA=Cooperative Agreement, CCC=Commodity Credit Corporation, BPA=Blanket Purchase Agreement, ESF=Emergency Support Function, NVS=National Veterinary Stockpile, NRMT=National Response Management Team.

---

## APHIS ORGANIZATION FOR A SINGLE INCIDENT

The ICP is a physical location that administers the on-scene IC and the other major incident management functions. An Emergency Operations Center (EOC) is a physical location that is located separately from the on-scene ICP and supports the on-scene response by providing external coordination and securing of additional resources. A MAC Group does not have any direct IC involvement and will often be located some distance from the incident site(s). EOC/MAC Groups do not command the on-scene level of the incident, but rather supports the ICP's command and management efforts.

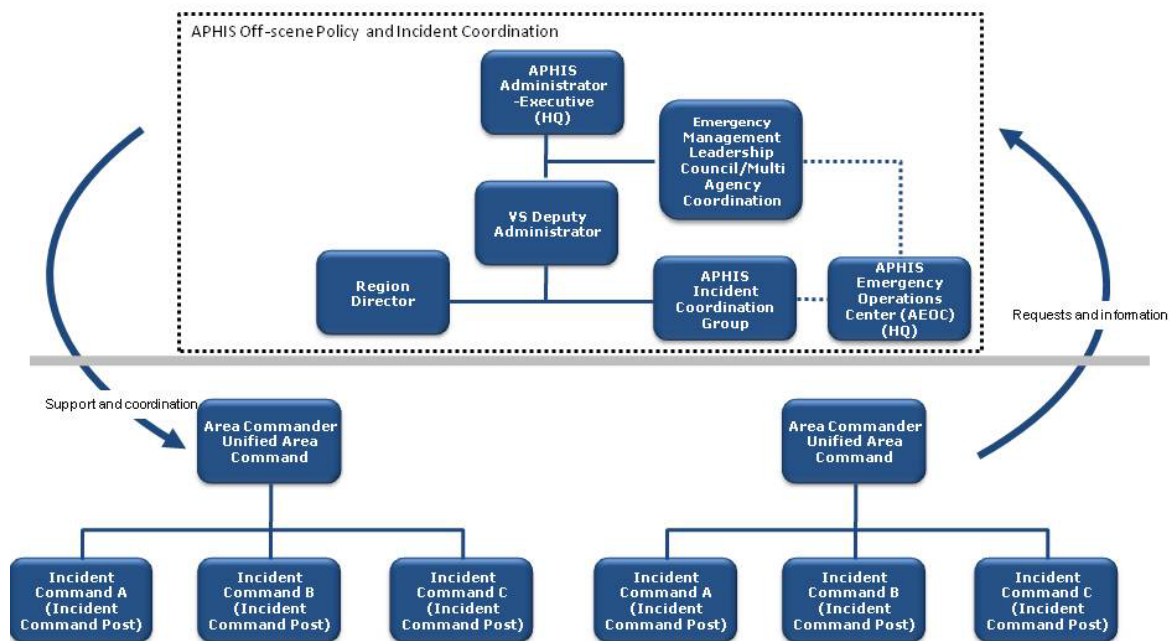
At the start of any FAD outbreak, the State Animal Health Official (SAHO), or designee, and Area Veterinarian in Charge (AVIC), or designee, will initially serve as co-Incident Commanders for the unified ICP. The AVIC and SAHO may be relieved by an Incident Management Team (IMT) if there is a delegation of authority to the IMT. Figure B-3 is an example of an APHIS organization chart for a single incident.

## APHIS ORGANIZATION FOR MULTIPLE INCIDENTS

When more than one incident is occurring at the same time, more than one IC may be established. An AC may also be established. AC is an organization that oversees the management of multiple incidents handled individually by separate IC organizations or to oversee the management of a very large or evolving incident engaging multiple IMTs. An AC should not be confused with the functions performed by MAC as AC oversees management coordination of the incident(s), while a MAC element (such as a communications/dispatch center, EOC, or MAC Group) coordinates support.

In terms of MAC Group structures, if the emergency response becomes too large for an APHIS MAC Group to handle efficiently—for example, a large multistate incident with numerous response activities—cooperation from other agencies or committees will be implemented. MAC Groups will coordinate additional resources and make decisions regarding the prioritization of incidents and the sharing and use of critical resources, but are not a part of the on-scene IC. Figure B-5 is an example of the command structure when multiple incidents are involved.

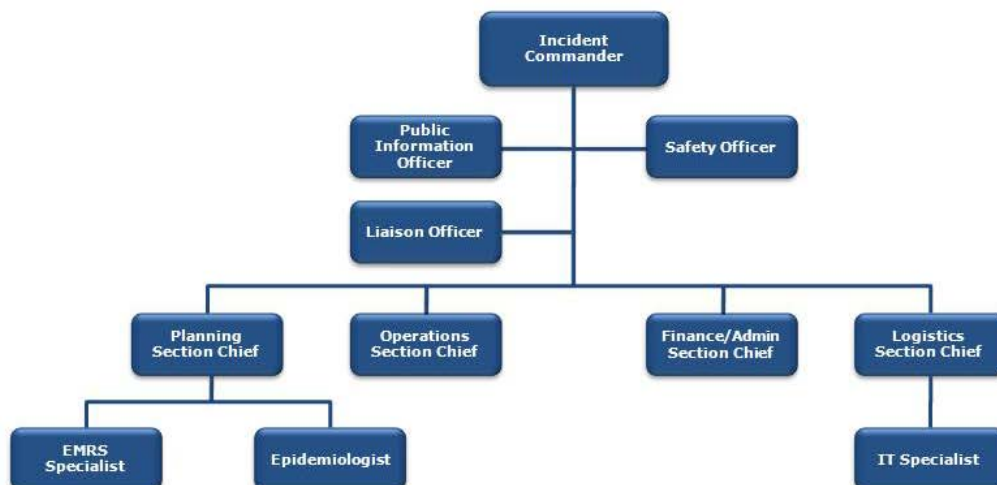
*Figure B-5. APHIS MAC Structures and APHIS Emergency Operations Center: Relationship to Multiple Incident Management Team Structures (Assuming Multiple Incidents and a Unified Area Command)*



## APHIS INCIDENT MANAGEMENT TEAMS

Upon detection and confirmation of an FAD incident, the SAHO or AVIC establishes an ICP with an IMT, headed by an Incident Commander. Figure B-6 depicts the organization of the APHIS VS IMT for managing an incident.

*Figure B-6. Current APHIS VS Incident Management Team—Short Team Configuration*



The IMT includes an Incident Commander and staff for various types of communication, safety, and liaison purposes. This staff and the heads of the Incident Commander's line organization sections are considered the Incident Commander's general staff. The IMT also includes four line organizations to perform all of the efforts required to identify, contain, eradicate, recover, and return the situation to normal business practices. These line organizations include sections for operations, planning, logistics, and finance and administration. Within each of these sections is the capability to accomplish all of the tasks necessary to ensure a successful outcome to an FAD incident.

For single-incident outbreaks where the potential for spread is low, a short team configuration as depicted in Table B-1 will suffice.

*Table B-1. List of Short Team Configuration Positions*

APHIS VS IMT Short Team	APHIS Emergency Responder Position Catalog
Incident Commander	A800 Incident Commander
Deputy Incident Commander	A800 Incident Commander
Operations Section Chief	A810 Operations Section Chief
Deputy Operations Section	A810 Operations Section Chief
Planning Section Chief	A820 Planning Section Chief
Deputy Planning Section	A820 Planning Section Chief
Logistics Section Chief	A830 Logistics Section Chief
Deputy Logistics Section	A830 Logistics Section Chief
Finance Section Chief	A840 Finance Section Chief
Deputy Finance Section	A840 Finance Section Chief
Safety Officer	A805 Safety Officer (or A001)
Assistant Safety Officer	A805 Safety Officer
Public Information Officer	A803 Public Information Officer
Liaison Officer	A807 Liaison Officer
Assistant Liaison Officer	A807 Liaison Officer
Information Technology Spec.	A122 Information Technology Specialist
Asst. Information Tech. Spec.	A122 Information Technology Specialist
EMRS Specialist	A813 Group Supervisor (or Specialist)
Assistant EMRS Specialist	A813 Group Supervisor (or Specialist)
Epidemiologist	A813 Group Supervisor (or Specialist)
Assistant Epidemiologist	A813 Group Supervisor (or Specialist)

Note: EMRS=Emergency Management Response System

When an outbreak occurs that is complex or large scale, a long team configuration, as listed in Table B-2, will be established. The long team consists

of additional team members beyond those in the initial short team configuration. Figure B-7 shows an example long team configuration; however, the exact makeup of the long teams will depend on the type of disease and magnitude of spread.

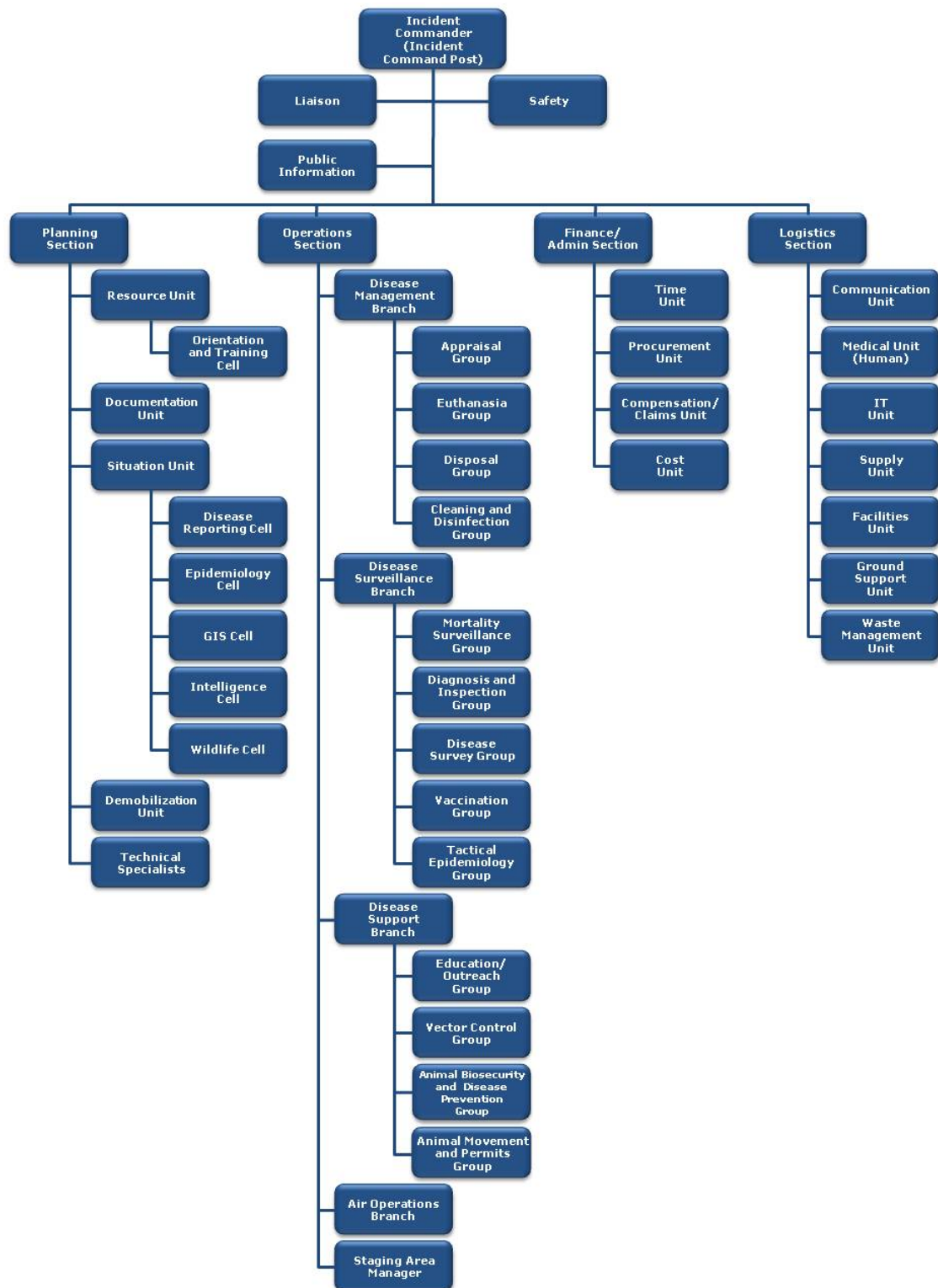
*Table B-2. Typical Positions—Long Team Configuration*

APHIS VS Long IMT Configuration	APHIS Emergency Responder Position Catalog
Deputy Operations Section Chief	A810 Operations Section Chief
Deputy Planning Section Chief	A820 Planning Section Chief
Deputy Logistics Section Chief	A830 Logistics Section Chief
Deputy Finance Section Chief	A840 Finance Section Chief
Disease Management Branch Director ◆ Appraisal Group Supervisor ◆ Euthanasia Group Supervisor ◆ Disposal Group Supervisor ◆ Cleaning & Disinfection Group Supervisor	A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor
Disease Surveillance Branch Director ◆ Mortality Surveillance Group Supervisor ◆ Diagnosis and Inspection Group Supervisor ◆ Disease Survey Group Supervisor ◆ Vaccination Group Supervisor ◆ Tactical Epidemiology Group Supervisor	A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor
Disease Support Branch Director ◆ Education/Outreach Group Supervisor ◆ Vector Control Group Supervisor ◆ Biosecurity and Disease Prevention Group Supervisor ◆ Movement and Permits Group Supervisor	A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor
Air Operations Branch	—
Staging Area Manager (Operations)	—
Resources Unit Leader ◆ Orientation and Training Group Supervisor	A821 Resources Unit Leader A813 Group Supervisor
Documentation Unit Leader	A823 Documentation Unit Leader
Situation Unit Leader ◆ Disease Reporting Cell Supervisor ◆ Epidemiology Cell Supervisor ◆ Geographic Information System (GIS) Cell Supervisor ◆ Intelligence Cell Supervisor ◆ Wildlife Cell Supervisor	A813 Group Supervisor (or A822) A813 Group Supervisor A813 Group Supervisor A813 Group Supervisor (or A825) A813 Group Supervisor A813 Group Supervisor (or A045)
Demobilization Unit Leader	A824 Demobilization Unit Leader

*Table B-2. Typical Positions—Long Team Configuration*

APHIS VS Long IMT Configuration	APHIS Emergency Responder Position Catalog
<ul style="list-style-type: none"> <li>◆ Communications Unit Leader</li> <li>◆ Medical Unit Leader</li> <li>◆ Information Technology Specialist</li> <li>◆ Supply Unit Leader</li> <li>◆ Facilities Unit Leader</li> <li>◆ Ground Support Unit Leader</li> <li>◆ Waste Management Unit Leader</li> </ul>	A831 Communications Unit Leader A815 Team Leader (or A001 or A057) A122 IT Specialist A833 Supply Unit Leader A834 Facilities Unit Leader A832 Ground Support Unit Leader A003 Environmental Protection Specialist
<ul style="list-style-type: none"> <li>◆ Time Unit Leader</li> <li>◆ Procurement Unit Leader</li> <li>◆ Compensation/Claims Unit Leader</li> <li>◆ Cost Unit Leader</li> </ul>	A842 Time Unit Leader A841 Procurement Unit Leader A844 Compensation/Claims Unit Leader A843 Cost Unit Leader

Figure B-7. Example APHIS VS Incident Management Team—Long Team Configuration





---

## RESPONSE RESOURCES

The IMT, ICG, and APHIS MAC Group can use a number of systems to aid in staffing and resourcing during an event such as the Emergency Qualification System (EQS) and the Resource Ordering and Status System (ROSS), which are discussed below. The *APHIS Emergency Mobilization Guide* and the *NCAHEM Incident Coordination Group Plan* are two planning documents that are used as response resources.

### APHIS Emergency Mobilization Guide

The *APHIS Emergency Mobilization Guide* provides information and policy for mobilizing APHIS personnel for emergency events. The *APHIS Emergency Mobilization Guide* is available at:

[http://www.aphis.usda.gov/emergency\\_response/](http://www.aphis.usda.gov/emergency_response/).

### NCAHEM Incident Coordination Group Plan

The *NCAHEM Incident Coordination Group Plan* provides details on how the VS program unit will provide incident coordination support during FAD outbreaks.

### APHIS Emergency Qualification System

The APHIS EQS is used to store the skills and qualifications of emergency response personnel and other data imported from the National Finance Center and AgLearn and to feed certification data to ROSS. It is customizable to APHIS program needs and can house training documents. Training documentation flows into EQS from AgLearn for APHIS employees. If the National Animal Health Emergency Response Corps (NAHERC) volunteers do not have access to AgLearn, their training documentation can be manually entered or imported through an Excel spreadsheet.

### APHIS Resource Ordering and Status System

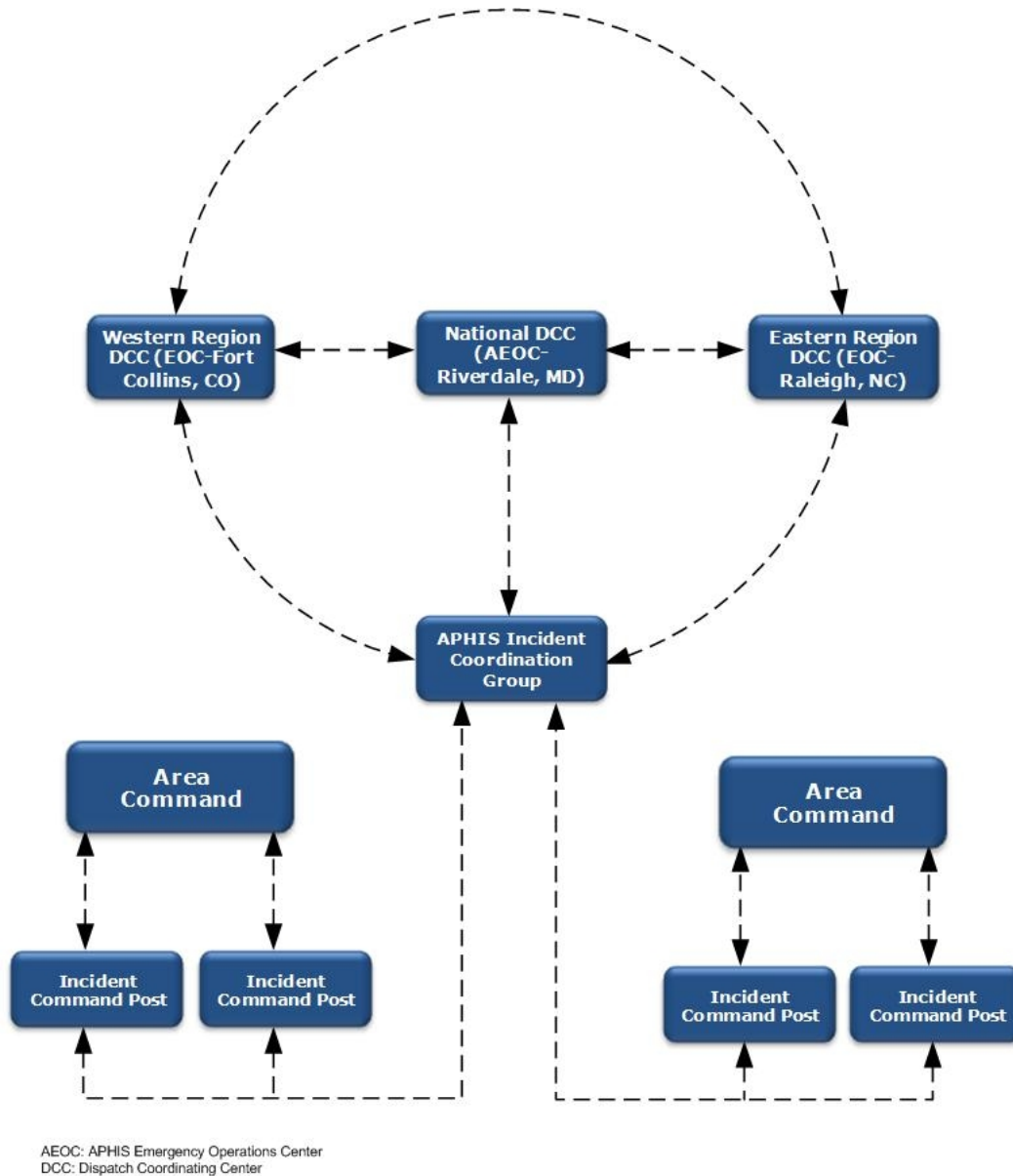
The APHIS ROSS allows APHIS to identify, track, and mobilize the resources needed to support emergency response. It provides a database of qualified emergency response personnel. The database can be searched according to personnel training levels and subject of expertise, such as procurement, epidemiology, or public information. Being able to quickly identify and dispatch appropriate personnel and supplies is a key component of emergency response, and ROSS facilitates that process. ROSS initiatives include the following:

- ◆ Developing the *APHIS Emergency Responder Position Catalog*;
- ◆ Integrating ROSS into APHIS emergency management practices; and

- ◆ Training and sustaining an APHIS dispatch community.

Figure B-8 illustrates the relationships among the APHIS ICG, Dispatch Coordination Centers, AC, and ICP.

Figure B-8. Resource Ordering Coordination<sup>4</sup>



<sup>4</sup> USDA APHIS, 2009. *Emergency Mobilization Guide*.

## Appendix C

# Laboratory Network List for AI

---

National Animal Health Laboratory Network (NAHLN) laboratories are listed at [http://www.aphis.usda.gov/animal\\_health/nahln/labs.shtml](http://www.aphis.usda.gov/animal_health/nahln/labs.shtml). This list was last updated in June 2012. The following laboratories can currently perform testing for avian influenza after National Veterinary Services Laboratory confirmation of highly pathogenic avian influenza.

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

#	State	Laboratory	Phone Numbers
1	Alabama	Thompson-Bishop-Sparks State Diag. Laboratory 890 Simms Road, PO Box 2209 Auburn, AL 36832	334-844-4987 Fax 334-844-7206
2	Arizona	Arizona Veterinary Diagnostic Laboratory 2831 N. Freeway Tucson, AZ 85705	520-621-2356 Fax 520-626-8696
3	Arkansas	Arkansas Livestock & Poultry Commission Laboratory One Natural Resources Drive Little Rock, AR 72205	501-907-2430 Fax 501-907-2410
4	California	California Animal Health & Food Safety Lab University of California, School of Vet Med W. Health Science Drive Davis, CA 95616	530-752-8709 Fax 530-752-5680
5	Colorado	Colorado State University Veterinary Diag. Lab 300 West Drake Road, Bldg 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 N. Eagleville Road Storrs, CT 06269-3089	860-486-3738 Fax 860-486-2737
7	Delaware	Charles C. Allen Biotechnology Laboratory Dept of Animal & Food Sciences, University of Delaware, 531 South College Ave., Rm 44 Townsend Hall Newark, DE 19716-2150	302-275-2759 Fax 302-831-2822
8	Delaware	University of Delaware Lasher Laboratory 16684 County Seat Hi-Way Georgetown, DE 19947	302-856-0046 ext. 700 or 702
9	Florida	Bronson Animal Disease Diagnostic Laboratory Florida Department of Agriculture and Consumer Sciences 2700 N. John Young Parkway Kissimmee, FL 34741	321-697-1400 Fax 321-697-1467
10	Georgia	University of Georgia Tifton Veterinary Diagnostic Laboratory 43 Brighton Road, PO Box 1389 Tifton, GA 31793-3000	229-386-3340 Fax 229-386-3399

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

#	State	Laboratory	Phone Numbers
11	Georgia	Athens Veterinary Diagnostic Laboratory 501 DW Brooks Drive University of Georgia Athens, GA 30602	706-542-5568 Fax 706-542-5977
12	Georgia	Georgia Poultry Laboratory Network 4457 Oakwood Road Oakwood, GA 30566	770-535-5996
13	Georgia	USDA, FSIS, Food Emergency Response Network Division 950 College Station Road Athens, GA 30605	706-546-3578 Fax 706-546-3656
14	Hawaii	State Laboratories Division 2725 Waimano Home Road Pearl City, HI 96782	808-453-6650 Fax 808-453-5995
15	Illinois	University of Illinois Veterinary Diagnostic Laboratory 2001 S. Lincoln Urbana, IL 61802-6199	217-333-1620 Fax 217-244-2439
16	Indiana	Indiana Animal Disease Diagnostic Laboratory at Purdue University 406 South University Street West Lafayette, IN 47907	765-494-7440 Fax 765-494-9181
17	Iowa	Iowa State University Veterinary Diagnostic Laboratory 1600 S. 16th Street Ames, IA 50011	515-294-1950 Fax 515-294-3564
18	Iowa	USDA, APHIS, VS, NVSL, Diagnostic Virology Laboratory 1920 Dayton Avenue Ames, IA 50010	515-337-7551 Fax 515-337-7348
19	Kansas	Kansas State Veterinary Diagnostic Laboratory Kansas State University, CVM L232 Mosier Hall, 1800 Dennison Avenue Manhattan, KS 66506	785-532-5650 Fax 785-532-4039
20	Kentucky	Breathitt Veterinary Center Murray State University 715 North Drive Hopkinsville, KY 42240	270-886-3959 Fax 270-886-4295
21	Kentucky	University of Kentucky, Veterinary Diagnostic Laboratory 1490 Bull Lea Road Lexington, KY 40511	859-257-8283 Fax 859-255-1624
22	Louisiana	Louisiana Animal Disease Diagnostic Laboratory Veterinary Med Diag. Laboratory, LSU Baton Rouge, LA 70803	225-578-9777 Fax 225-578-9784
23	Maryland	Maryland Dept. of Ag & Salisbury Animal Health Laboratory 27722 Nanticoke Road Salisbury, MD 21801	410-543-6610 Fax 410-543-6676
24	Maryland	Frederick Animal Health Laboratory 1840 Rosemount Avenue Frederick, MD 21702	301-600-1548 Fax 301-600-6111

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

#	State	Laboratory	Phone Numbers
25	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
26	Minnesota	University of Minnesota Veterinary Diagnostic Lab 1333 Gortner Avenue, 244 Vet D L St. Paul, MN 55108	612-625-8787 Fax 612-624-8707
27	Mississippi	Mississippi Veterinary Research & Diagnostic Laboratory 3137 Hwy 468 West Pearl, MS 39208	601-420-4700 Fax 601-420-4719
28	Missouri	Veterinary Medical Diagnostic Laboratory University of Missouri 1600 East Rollins Columbia, MO 65211	573-882-6811 Fax 573-882-1411
29	Montana	Montana Veterinary Diagnostic Laboratory PO Box 997 Marsh Laboratory, 19th and Lincoln Bozeman, MT 59771	406-994-4885 Fax 406-994-6344
30	Nebraska	Veterinary Diagnostic Center University of Nebraska, East Campus Loop and Fair Street Lincoln, NE 68583-0907	402-472-1434 Fax 402-472-3094
31	New Jersey	New Jersey Dept of Ag, Division of Animal Health Animal Health Diagnostic Laboratory, NJPHEAL 3 Schwarzkopf Drive Ewing, NJ 08628	609-406-6999 Fax 609-671-6414
33	New York	Animal Health Diagnostic Center Upper Tower Road College of Vet Med, Cornell University Ithaca, NY 14853	607-253-3900
34	North Carolina	Rollins Diagnostic Laboratory North Carolina Department of Agriculture 2101 Blue Ridge Road Raleigh, NC 27607	919-733-3986 Fax 919-733-0454
35	North Dakota	Veterinary Diagnostic Laboratory North Dakota State University NDSU Dept. 7691, PO Box 7691 Fargo, ND 58108-6050	701-231-8307 Fax 701-231-7514
36	Ohio	Ohio Department of Agriculture Animal Disease Diagnostic Lab 8995 E. Main Street, Building 6 Reynoldsburg, OH 43068	614-728-6220 Fax 614-728-6310
37	Oklahoma	Oklahoma Animal Disease Diagnostic Laboratory Oklahoma State Univ., College of Vet. Med. Farm & Ridge Road Stillwater, OK 74078	405-744-6623 Fax 405-744-8612

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

#	State	Laboratory	Phone Numbers
38	Oregon	Oregon State University Veterinary Diagnostic Lab Magruder Hall 134 Corvallis, OR 97331	541-737-3261 Fax 541-737-6817
39	Pennsylvania	University of Pennsylvania, School of Veterinary Medicine New Bolton Center, PADLS 382 West Street Road Kennett Square, PA 19348-1692	610-444-5800 Fax 610-925-6806
40	Pennsylvania	Pennsylvania State University, Animal Diagnostic Lab Orchard Road University Park, PA 16802	814-863-0837 Fax 814-865-3907
41	South Carolina	Clemson Veterinary Diagnostic Center 500 Clemson Road, PO Box 102406 Columbia, SC 29229	803-788-2260 Fax 803-788-8058
42	South Dakota	Animal Disease Research & Diagnostic Lab South Dakota State University Box 2175, N. Campus Drive Brookings, SD 57007	605-688-5171 Fax 605-688-6003
43	Tennessee	CE Kord Animal Disease Diagnostic Lab Ellington Agricultural Center 440 Hogan Road Nashville, TN 37220	615-837-5125 Fax 615-837-5250
44	Texas	Texas Veterinary Medical Diagnostic Laboratory 1 Sippel Road, Drawer 3040 College Station, TX 77843	979-845-3414 Fax 979-845-1794
45	Texas	Texas Veterinary Medical Diagnostic Laboratory – Amarillo 6610 Amarillo Blvd West Amarillo, TX 79106	806-353-7478 Fax 806-359-0636
46	Texas	Texas Veterinary Medical Diagnostic Laboratory—Center 635 Malone Drive Center, TX 75935	936-598-4451 Fax 936-598-2741
47	Utah	Utah Veterinary Diagnostic Laboratory 950 E. 1400 North Logan, UT 84322-5700	435-797-1895 Fax 435-797-2805
48	Washington	Washington Animal Disease Diagnostic Laboratory PO Box 647034 Bustad Hall, Room 155-N Pullman, WA 99164-7034	509-335-9696/ 509-335-6190 Fax 509-335-7424
49	Washington	Washington Animal Disease Diag. Laboratory Avian Health and Food Safety Lab, Puyallup 2607 W Pioneer Puyallup, WA 98371-4919	253-445-4537 Fax 253-445-4544
50	West Virginia	West Virginia Dept of Ag. Poultry Health Division 60B Moorefield Industrial Park Moorefield, WV 26836	304-538-2397 Fax 304-538-8133
51	Wisconsin	Wisconsin Veterinary Diagnostic Laboratory University of Wisconsin-Madison 445 Easterday Road Madison, WI 53706	608-262-5432 Fax 847-574-8085

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

#	State	Laboratory	Phone Numbers
52	Wisconsin	USGS National Wildlife Health Center 6006 Schroeder Road Madison, WI 53711	608-270-2419/ 608-270-2400 Fax 608-270-2415
53	Wyoming	Wyoming State Veterinary Laboratory 1174 Snowy Range Road Laramie, WY 82070	307-766-9925 Fax 307-721-2051

## Appendix D

# Overview of Secure Egg Supply Plan

---

The *SES Summary Plan* is located at [www.secureeggssupply.com](http://www.secureeggssupply.com) and [http://www.aphis.usda.gov/animal\\_health/emergency\\_management/](http://www.aphis.usda.gov/animal_health/emergency_management/). This appendix provides a brief overview of the *Secure Egg Supply 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:

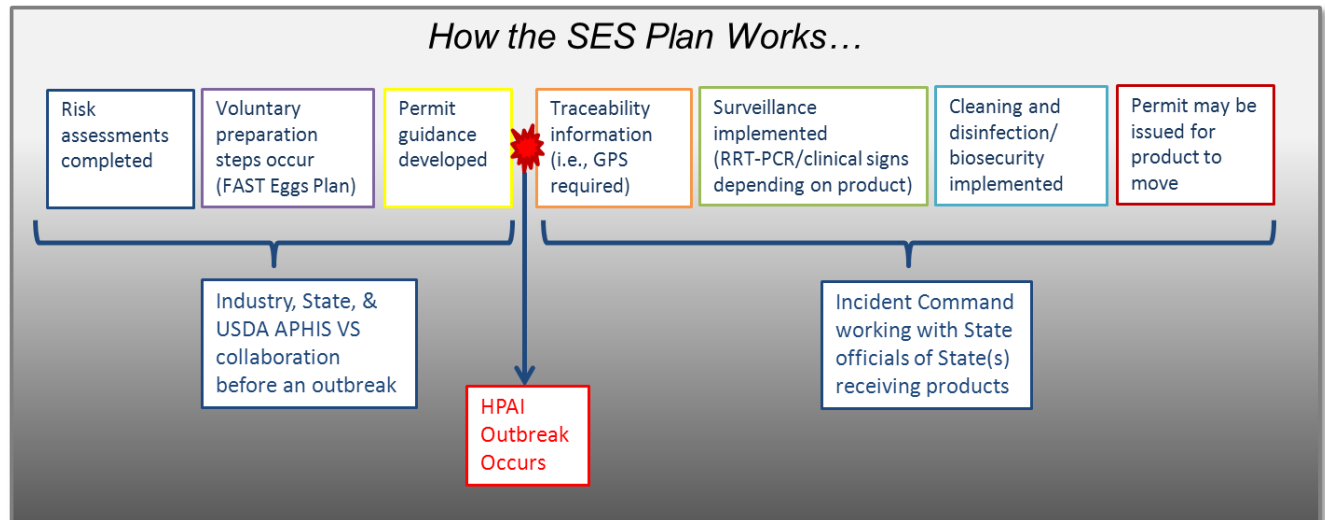
- ◆ University of Minnesota Center for Animal Health and Food Safety (CAHFS)
- ◆ Iowa State University Center for Food Security and Public Health (CFSPH)
- ◆ United Egg Producers
- ◆ United Egg Association
- ◆ Egg sector veterinarians, officials, and representatives
- ◆ State officials
- ◆ The USDA Animal 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 D-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 D-1, this plan pro-



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

Figure D-1. How the SES Plan Works



The *SES Plan* currently contains permit guidance on pasteurized liquid egg, non-pasteurized liquid egg, washed and sanitized shell eggs, nest run shell eggs, layer hatching eggs, and layer day-old chicks. Other products may be added in the future.

Specific criteria must be fulfilled to qualify for movement permits. Movement will be 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 Federal and State Transport (FAST) Eggs Plan (epidemiological assessment and biosecurity checklist), can be found at <http://secureeggssupply.com>.

Table D-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 RRT-PCR result is negative?	Action:	Permit guidance to move off the farm (NOT to market):	And the premises biosecurity is acceptable?	And the epidemiological assessment is acceptable?	And the second RRT-PCR result is negative?	Action:	Permit guidance to move to market channels:
<b>Pasteurized liquid egg</b>	Negligible	YES	YES	1. Truck and driver biosecurity			<i>These steps are not required for this product.</i>					Issue PERMIT to market
<b>Non-pasteurized liquid egg</b>	Negligible	YES	YES	1. Truck and driver biosecurity	YES	→	Issue PERMIT to move to pasteurization	Non-pasteurized liquid egg becomes pasteurized liquid egg				
<b>Washed and sanitized shell egg (to premises without poultry)</b>	Negligible	YES	YES	1.Truck and driver biosecurity 2.Product-specific biosecurity	YES	→	Issue PERMIT to move off premises to a storage or holding area	YES	YES	YES	→	Issue PERMIT to move to market for eggs collected 2 days earlier
<b>Washed and sanitized shell egg (to premises with poultry)</b>	Low	YES	YES	1.Truck and driver biosecurity 2.Product-specific biosecurity	YES	→	Issue PERMIT to move off premises to a storage or holding area	YES	YES	YES	→	Issue PERMIT to move to market for eggs collected 2 days earlier
<b>Nest run shell eggs</b>	Low	YES	YES	1.Truck and driver biosecurity 2.Product-specific biosecurity	YES	→	NO PERMIT issued until 2 negative RRT-PCR tests	YES	YES	YES	→	Issue PERMIT to move to processing for eggs collected 2 days earlier (can move immediately to market after processing)
<b>Layer hatching eggs</b>	Low	YES for both the breeder farm and the hatchery	YES	1.Truck and driver biosecurity 2.Product-specific biosecurity	YES	→	NO PERMIT issued until 2 negative RRT-PCR tests	YES	YES	YES	→	Issue PERMIT to move to hatchery or processing for eggs collected 2 days earlier
<b>Layer day-old chicks</b>	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	NA		NA	YES	YES	NA	→	Issue PERMIT to move layer day-old chicks to pullet farm; 21-day quarantine at pullet premises

# Appendix E

## Updated HPAI Outbreak Surveillance Guidance and Rationale for Poultry

---

### HPAI OUTBREAK SURVEILLANCE GUIDELINES FOR POULTRY

These guidelines are updated recommendations for highly pathogenic avian influenza (HPAI) outbreak surveillance, prepared by the National Surveillance Unit of the Centers for Epidemiology and Animal Health, Veterinary Services, Animal Plant Health Inspection Service. These guidelines may be updated periodically.

#### Purpose

The purpose of these guidelines is to provide recommendations for surveillance activities in poultry for this HPAI Response Plan. These are sample guidelines.

Surveillance will be conducted at intervals as specified by the Incident Command (IC) using the most current scientific information and best practice guidance available. APHIS will collaborate with public health agencies regarding the threat of HPAI to humans.

These are strategies regarding sampling sizes and sampling frequencies for premises located in the Infected Zone (IZ), Buffer Zone (BZ), Surveillance Zone (SZ), and for proof of disease freedom (DF) that do not require daily bird or product movement for business continuity (such as layer, broiler, turkey, and game birds). Business continuity surveillance schemes are discussed in the Secure Egg Supply Plan, [www.secureeggssupply.com](http://www.secureeggssupply.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 Control Area (CA);
  - ◆ provide information for animal and product movement out of the CA; and
  - ◆ prove DF and regain disease-free status after eradication of the outbreak.

## 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 Pool* combines samples taken from five dead or euthanized sick birds out of the house's (flock's) daily dead birds into one sample.
- ◆ *Detection Probability* is the probability the sampling scheme will detect at least one 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 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:

- ◆ This is used as basic surveillance in the Highly Contagious Disease Plan, and starts immediately **after HPAI outbreak response authorization**.
- ◆ It is rapidly exceeded because HPAI quickly spreads throughout a house, killing many birds.
- ◆ It reduces the number of days that the premises are infectious by at least 48 hours.<sup>1</sup>
- ◆ It is logistically feasible, flexible, simple, and standardized.

---

<sup>1</sup> The U.S. Department of Agriculture/APHIS National Avian Influenza Surveillance Plan (June 26, 2007) estimated that 10–14 days would elapse between premises infection and disease detection based on mortality criteria (broilers: 4 dead birds/1,000 birds, layers: 4 times normal daily death rate, and turkeys: 2 dead birds/1,000 birds.)

- ◆ 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 upon HPAI outbreak response authorization.
2. Implement disease detection sampling schemes.

### 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 five 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 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 are listed in Table E-3; and
    - recommendations for sampling frequency of live birds without clinical signs, in instances where flock sizes are small and daily mortality is limited are listed in Table E-4.

### Disease Detection Surveillance Scheme

#### 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.

- 
- ◆ Sampling frequency:
    - Contact Premises (CP), Suspect Premises (SP), and Monitored Premises (MP):
      1. Collect swabs for the 5-bird pool sample(s) on each premises every other day for 14 days.<sup>2</sup>
      2. CP, SP, or MP that test negative in the above sampling regime should then 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 days for the duration of the quarantine.

## Buffer Zone

- ◆ Census of premises within zone; sample premises as prioritized by epidemiological investigation and continuity of business requirements.
- ◆ Sampling frequency:
  - MP, CP, and SP:
    1. Collect swabs for the 5-bird pool sample(s) on each premises every other day for 14 days.<sup>3</sup>
    2. MP, CP, or SP that test negative in the above sampling regime should then 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 days for the duration of the quarantine.<sup>4</sup>

---

<sup>2</sup> 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 E-3.

<sup>3</sup> 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 E-3.

## Surveillance Zone

- ◆ Number of premises to be sampled:
  - Calculate the number of premises to be sampled using the sample size calculators located in the Outbreak Surveillance Toolbox<sup>5</sup> or Cannon formula.
  - 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,
    - Or a census, if the number of premises within the zone is small, and
    - In order as prioritized by epidemiological investigation and continuity of business requirements.
- ◆ Sampling frequency:
  - Randomly select the calculated number of premises to be sampled (as determined above, such as 60), and collect swabs for the 5-bird pool(s) on each of the selected premises once during the first 3-week period of the quarantine.
  - Randomly select (include in the sampling list the premises sampled in the first 3-week period) and sample an equal number of premises (as calculated above) once during each additional 3-week period of the quarantine. For example, randomly select and sample 60 premises once during the first 3-week period, then reselect (with replacement) another 60 premises to be sampled in the second 3-week period for the duration of quarantine.

## BACKYARD PREMISES

The same sampling unit and sample is used in backyard premises as in commercial premises.

---

<sup>4</sup> 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 #11 in Assumptions).

<sup>5</sup> Available from <http://inside.aphis.usda.gov/vs/ceah/nsu/toolbox/index.html> (for APHIS employees). For those that are not APHIS employees, please e-mail [National.Surveillance.Unit@aphis.usda.gov](mailto:National.Surveillance.Unit@aphis.usda.gov) with your request.

---

## 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 for the 5-bird pool(s) from each 50-dead-bird group from each flock on the premises (most backyard flocks have less than 50 birds, thereby requiring one 5-bird pool).
- ◆ Observation and sampling frequency:
  - CP and SP:
    - Observe entire flock for HPAI signs (swab if there are any HPAI signs or epidemiological links) every other day for 1 week.
      - Frequency of observation and sampling depends on available personnel, number of premises to be sampled, owner resistance (hostility), and other factors.
      - The Incident Commander must balance premises' transmission risks and detection costs in deciding on observation/sampling frequency.
    - CP and SP that test negative or have no signs of HPAI in the above observation and sampling regime and no epidemiological links should then 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 days for the duration of the quarantine.

## 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 for the 5-bird pool from each 50-dead-bird group from each flock on the premises.



- ◆ Observation and sampling frequency:
  - CP and SP:
    - Observe entire flock for HPAI signs (swab if there are any HPAI signs) every other day for 1 week.<sup>6</sup>
    - CP and SP that test negative or that have no signs of HPAI in the above observation/sampling regime should then 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 days for the duration of the quarantine.

## Surveillance Zone

- ◆ 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.
- ◆ Number of premises to be observed/sampled:
  - Calculate the number of premises to be observed/sampled using the sample size calculators located in the Outbreak Surveillance Toolbox or Cannon formula.
  - 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;
    - or a census, if the number of premises within the zone is small; and
    - in order as prioritized by epidemiological investigation and continuity of business requirements.

---

<sup>6</sup> 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 E-3.

- 
- ◆ Sampling frequency:
    - Randomly select the calculated number of premises to be observed or sampled (as determined above, such as 60), and swab the dead or euthanized sick birds on each of the selected premises once during the first 3-week period of quarantine.
    - Randomly reselect (include the premises observed/sampled in the first 3-week period in the sampling list frame) and sample an equal number of premises (as calculated above) once during each additional 3-week period of the quarantine. For example, randomly select and observe or sample 60 premises once during the first 3-week period, then reselect (with replacement) another 60 premises to be observed/sampled in the second 3-week period for the duration of quarantine.

## 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 E-2 which summarizes proof of DF surveillance for HPAI in poultry.

- ◆ Surveillance for proof of DF starts 21 days (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 will be detected via increased surveillance methods listed below and investigation of flocks with suspicious signs.
- ◆ OIE recommends intensifying surveillance schemes in conjunction with surveillance of the CA through:
  - doubling 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
  - increasing the use of sentinel flocks.

## COMMERCIAL PREMISES DISEASE FREEDOM

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

- ◆ Number of samples per flock:
  - Calculate the number of premises to sample using the sample size calculators located in the Outbreak Surveillance Toolbox or Cannon formula.
  - 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 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.
- ◆ Number of premises to be sampled (serology and swabs of dead and euthanized sick birds):
  - Calculate the number of premises to sample using the sample size calculators located in the Outbreak Surveillance Toolbox or Cannon formula.
  - 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.
- ◆ 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.

## BACKYARD PREMISES (DISEASE FREEDOM)

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

- ◆ Number of samples per flock:
  - Calculate the number of premises to sample using the sample size calculators located in the Outbreak Surveillance Toolbox or Cannon formula.

- 
- 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 15 percent where the maximum birds sampled doesn't exceed 60 birds per flock, and
    - one 5-bird pool sample submitted for each 50-dead-bird group.
  - ◆ Number of premises to be sampled (serology and swabs of dead and euthanized sick birds):
    - Calculate the number of premises to sample using the sample size calculators located in the Outbreak Surveillance Toolbox or Cannon formula.
    - 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.
  - ◆ 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.

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

- ◆ Inspect or sample premises located in the IZ or BZ that wish to move birds or products.
- ◆ The following three steps are required *prior* to bird or product movement:
  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. Sample (swab) immediately prior to moving product. For example, start sampling 3 days before product movement if 24 hours are required before receiving test results or 2 days if test results will be received on the day of testing.
  3. Visual inspection of birds in all houses on premises for 2 consecutive days including the day before and day of movement.

## FURTHER SURVEILLANCE INFORMATION

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

*Table E-1. Outbreak Surveillance for Disease Detection*

Disease Detection						
Post Outbreak Response Authorization						
	Commercial			Backyard		
Sampling	Infected Zone	Buffer Zone	Surveillance Zone <sup>&amp;</sup>	Infected Zone	Buffer Zone	Surveillance Zone <sup>&amp;</sup>
Number of Premises	Census	Census	5% Prevalence Threshold <sup>°</sup>	Census	Census	5% Prevalence Threshold <sup>°</sup>
Unit*	5-bird Pool	5-bird Pool	5-bird Pool	Observation then 5-bird Pool <sup>^</sup>	Observation then 5-bird Pool <sup>^</sup>	Observation then 5-bird Pool <sup>^</sup>
Frequency						
Free Premises	-		21 Days	-		21 Days
Monitored Premises	Every other day for 14 days		-	-		-
At-Risk Premises	5 Days <sup>#</sup>		-	5 Days <sup>#</sup>		-
Contact and Suspect Premises <sup>&amp;</sup>	Every other day for 14 days		-	Every other day for 14 days		-
Product Movement	2 consecutive negative tests <sup>@</sup>			2 consecutive negative tests <sup>@</sup>		

<sup>&</sup> SP in a SZ will be subject to surveillance procedures and diagnostic testing as indicated by relevant authorities.

\* 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).

<sup>°</sup> 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.

<sup>^</sup> 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.

<sup>#</sup> 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.

<sup>@</sup> 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 E-2 shows the surveillance requirements to prove HPAI-freedom.

*Table E-2. Surveillance for Proof of Disease Freedom*

Proof of Disease Freedom <sup>^</sup>						
Post Outbreak Eradication						
	Commercial			Backyard		
Sampling	Infected Zone <sup>\$</sup>	Buffer Zone <sup>\$</sup>	Surveillance Zone <sup>\$</sup>	Infected Zone <sup>\$</sup>	Buffer Zone <sup>\$</sup>	Surveillance Zone <sup>\$</sup>
Number of Serology Samples per Premises	15% Prevalence Threshold <sup>&amp;</sup>	15% Prevalence Threshold <sup>&amp;</sup>	15% Prevalence Threshold <sup>&amp;</sup>	15% Prevalence Threshold <sup>&amp;</sup>	15% Prevalence Threshold <sup>&amp;</sup>	15% Prevalence Threshold <sup>&amp;</sup>
Number of Premises	5% Prevalence Threshold <sup>°</sup>	5% Prevalence Threshold <sup>°</sup>	5% Prevalence Threshold <sup>°</sup>	5% Prevalence Threshold <sup>°</sup>	5% Prevalence Threshold <sup>°</sup>	5% Prevalence Threshold <sup>°</sup>
Unit*	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.					

<sup>^</sup> Sero-surveillance conducted in the area to be proved disease free in addition to dead bird sampling.

<sup>\$</sup> Infected, Buffer, and SZs combine as one unit for proof of DF.

<sup>&</sup> 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.

<sup>°</sup> 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.

\* 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 E-3 shows the complexity of sampling based on the incubation period of the HPAI virus and feasible sampling frequency.

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

<b>Estimated Incubation Period Based on Field Information*</b>			
	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 E-4 shows the number of live 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 E-4. Sampling Frequency for Live 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	1203	170	36
4,000	1604	227	48
5,000	2006	284	60

These estimates are based on a Reed-Frost transmission model where contact rate is defined as the 5<sup>th</sup> percentile of an expert opinion distribution [RiskPert(2.1,4.7,10.4)]<sup>7</sup> (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<sup>8</sup> 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.

## Assumptions for 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.

<sup>7</sup> National Avian Influenza Surveillance Plan, APHIS, December 15, 2006.

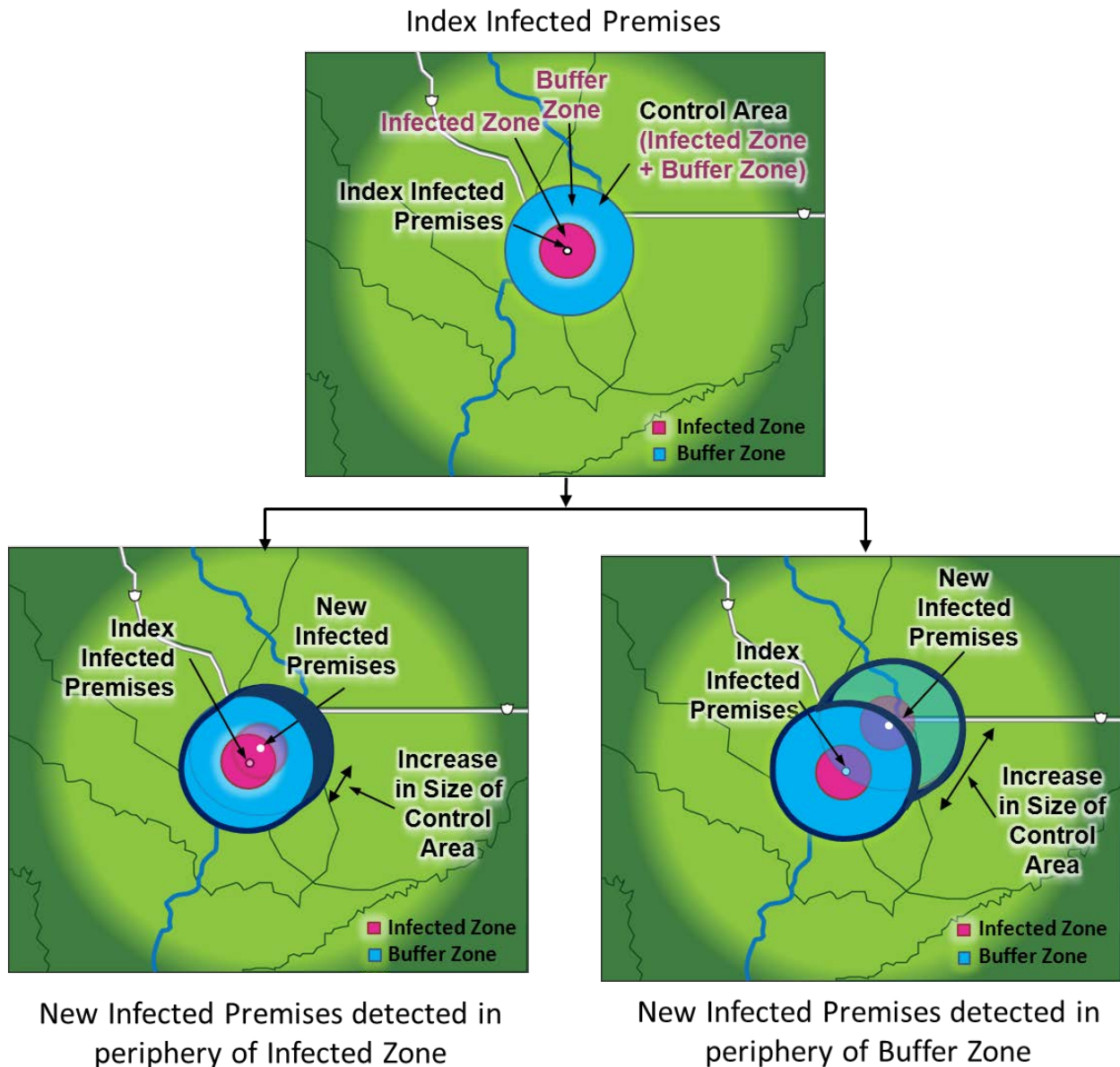
<sup>8</sup> Cannon, R. M., and R. T. Roe, 1982: Livestock Disease Surveys: A Field Manual for Veterinarians. Australian Bureau of Animal Health, Canberra. Also see Cannon, R.M. 2011. Sense and Sensitivity-Designing Surveys Based on an Imperfect Test. *Preventive Veterinary Medicine*, 49, 141–163.



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 varies from 5.1 to 27 birds per day (see daily death rate and house sizes of commercial producers in 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 E-1 shows that the size of the CA depends on where the new IP is located.

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



## Updated Background Information

- ◆ *Daily Mortality Rate:* The expected daily death rate ranges from 0.00051 (5.1/10,000) in hen turkeys to 0.00079 (7.9/10,000) in tom turkeys and a high of 0.00086 (8.6/10,000) in broilers per house. The daily death rate is higher in “meat type” poultry than in layers, where the daily death rate varies from 0.0001 to 0.0005. Major factors influencing the daily mortality rate are: bird strain, bird age (early, mid, or late cycle), and house construction design and age.

- ◆ *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 27,000 broilers per house. In layers, house sizes of 300,000 to 350,000 birds have become the norm.
- ◆ *Expected Daily Mortality:* Using information supplied above, the estimated number of expected dead birds per day in commercial houses varies from 5.0 to 5.5 birds per day in turkey flocks to 23 birds per day in broiler flocks. The numbers of dead birds per day that is expected to signal that producers take “diagnostic action” are 20 hen turkeys, 14 tom turkeys, and 47 broilers,<sup>9</sup> all the numbers of “expected” daily dead birds on which surveillance calculations are based are 40 percent or less of the “diagnostic action” numbers of dead birds.
- ◆ *Recommendations:* Test one 5-bird pool for every 50-dead-bird groups using the sampling schemes detailed in Table E-1 and Table E-3.

## References for this Appendix

- National Avian Influenza Surveillance Plan, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, June 29, 2007.
- Cannon, R.M. 2011. 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 Dr. Alex Thompson (NSU) and Drs. 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](http://www.uepcertified.com) and [www.unitedegg.org](http://www.unitedegg.org)).

---

<sup>9</sup> National Avian Influenza Surveillance Plan, U.S. Department of Agriculture, Animal and Plant Health Inspection Service, June 29, 2007.

## Appendix F

# Procedures for HPAI Investigation and Specimen Submission

---

Veterinary Services (VS) Memorandum 580.4 provides guidance for the investigation of potential foreign animal disease/emerging disease incidents. VS Memo 580.4 is currently under review. The document is available at <https://fadprep.lmi.org> and <http://inside.aphis.usda.gov/vs/em/fadprep.shtml> (for APHIS employees).

## Appendix G

# Epidemiological Investigation Questionnaire

---

This appendix contains a sample epidemiological questionnaire from the *Secure Egg Supply (SES) Plan* that could be employed in the event of a highly pathogenic avian influenza (HPAI) outbreak.

This epidemiological questionnaire is only an example template, and is based on the movement of eggs and egg products. Based on the epidemiological situation or the types of premises involved in the actual outbreak, it may be appropriate to add other questions regarding other risk factors which may play a role in transmission.

**SES PLAN**  
**Egg-Type Chickens HPAI Epidemiology Questionnaire**

**Date:** \_\_\_\_\_

Business/farm name: \_\_\_\_\_

Primary contact: \_\_\_\_\_

Business address: \_\_\_\_\_

Business telephone number: \_\_\_\_\_

Cell telephone number: \_\_\_\_\_

Fax number: \_\_\_\_\_

Home telephone number: \_\_\_\_\_

E-mail address: \_\_\_\_\_

Secondary contact: \_\_\_\_\_

Business address: \_\_\_\_\_

Business telephone number: \_\_\_\_\_

Cell telephone number: \_\_\_\_\_

Fax number: \_\_\_\_\_

Home telephone number: \_\_\_\_\_

E-mail address: \_\_\_\_\_

Farm Address (911 and Animal Location): \_\_\_\_\_

City: \_\_\_\_\_ Zip code: \_\_\_\_\_

County: \_\_\_\_\_ Township: \_\_\_\_\_

Range: \_\_\_\_\_ Section: \_\_\_\_\_

GPS coordinates (decimal degrees): \_\_\_\_\_

Premises identification number: \_\_\_\_\_

**The purpose of this epidemiological questionnaire is to help the Incident Management Team determine a premises' classification: Contact Premises, At-Risk Premises, or Monitored Premises. Additional information will be considered (e.g., daily PCR testing and production data) when decisions regarding movement permits are made.**

### **Employee Risk Factors**

1. Do any of your personnel work at other poultry premises or have they visited other poultry premises, hatcheries, processing plants, or poultry slaughtering facilities within the past 21 days? ☐ Yes ☐ No
  - a) If Yes, what premises? \_\_\_\_\_
2. Do any of your workers live with someone who works at another poultry farm, hatchery, processing plant, slaughter facility or rendering plant? ☐ Yes ☐ No
3. Have you hired new personnel during the past 21 days? ☐ Yes ☐ No
  - a) If Yes, did they work for another poultry premises before you hired them? ☐ Yes ☐ No
  - b) If Yes, where did they work prior to coming to your premises? \_\_\_\_\_
4. Has an employee from this premises visited a rendering plant within the past 21 days? ☐ Yes ☐ No
  - a) If Yes, what plant? \_\_\_\_\_
  - b) If Yes, did the person clean and disinfect his/her vehicle before returning to your premises? ☐ Yes ☐ No
  - c) If Yes, did the person change outer clothes before returning to your premises? ☐ Yes ☐ No
  - d) If Yes, did the person disinfect footwear or change into footwear dedicated to this premises upon return? ☐ Yes ☐ No

### **Biosecurity Risk Factors**

5. Are you enrolled in the FAST Eggs Plan? ☐ Yes ☐ No
  - a) If Yes, date of last audit \_\_\_\_\_
6. Have migratory waterfowl been seen on the ground or water within 0.62m (1 km) of your buildings containing chickens in the last 21 days? ☐ Yes ☐ No
  - a) If Yes, please describe: \_\_\_\_\_
7. Have free flying birds been observed in the chicken houses in the past 21 days? ☐ Yes ☐ No
8. Is feed protected from exposure to feces from wild birds, waterfowl, rodents and/or wild mammals? ☐ Yes ☐ No
9. Is water protected from exposure to feces from wild birds, waterfowl, rodents and/or wild mammals? ☐ Yes ☐ No

10. Which of the following describes this farm's usual carcass (daily mortality) disposal method?  
(Mark ALL that apply)

- |   |                                  |                                    |
|---|----------------------------------|------------------------------------|
| <input type="checkbox"/> Rendering              | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Composting             | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Burial                 | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Incineration           | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Other (specify: _____) |                                  |                                    |

11. Do you dispose of dead birds from other farms? ☐ Yes ☐ No

a) If Yes, please provide more details: \_\_\_\_\_

12. Have you introduced chicks onto this farm in the last 21 days? ☐ Yes ☐ No

a) Was the breeding flock serologically tested for avian influenza? ☐ Yes ☐ No

13. Did any birds move off this farm and then return to the farm (e.g., markets, shows, farmers' market, fair) in the past 21 days? ☐ Yes ☐ No

a. If Yes, please describe: \_\_\_\_\_

### Trace Back Information

In the last 21 days, did the following movements **ONTO** the farm occur? If yes, please provide as much accurate information as possible for each unique source. You can add more rows by 'right clicking' in the box and selecting "Insert > Insert Rows Below".

14. Eggs (e.g., sideloadng) ☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel entered chicken house? (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



**Movements ONTO the farm (continued)**

15. Live Birds (including replacement pullets or backfilling pullets) ☐ Yes ☐ No ☐ Don't know

Source/ name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing? (Yes/No)	Entered in visitor log? (Yes/No)	Were the chickens RRT- PCR tested for avian influenza prior to moving onto your farm? (Yes/No)

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

16. Feed trucks ☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing? (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

17. Fresh litter/bedding ☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing/ (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Movements ONTO the farm (continued)**

18. Personnel or equipment used to handle/haul manure and/or used litter?  
know

☐ Yes ☐ No ☐ Don't

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing/ (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

---

---

19. Catch/vaccination/beak trim crews

☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

---

---

20. Off-site Renderer

☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing? (Yes/No)	Entered in visitor log? (Yes/No)

- a) Did the driver leave the vehicle while on this premises? ☐ Yes ☐ No ☐ Don't know

b) If Yes, what area of the premises did he or she enter? \_\_\_\_\_

- c) Was driver required to wear outer clothes and foot wear provided by this premises?

☐ Yes ☐ No ☐ Don't know

Additional Comments: \_\_\_\_\_

---

---

**Movements ONTO the farm (continued)**

21. Company veterinarian/service technician

☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing? (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

22. Non-company veterinarian/consultant

☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing? (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

23. Service personnel (e.g., construction, gas, plumbing, pest control) ☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing? (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

**Movements ONTO the farm (continued)**

24. Customer/buyer/dealer

☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing? (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

25. Other poultry producer

☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing? (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

26. Any other visitor (friend/neighbor)

☐ Yes ☐ No ☐ Don't know

Source/name	Truck and equipment C&D before entering? (Yes/No)	Truck and equipment C&D when leaving? (Yes/No)	Personnel enter bird housing? (Yes/No)	Entered in visitor log? (Yes/No)

Additional Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

### Trace Forward Information

In the last 21 days, did the following movements **OFF** the farm occur? If yes, please provide as much accurate information as possible for each unique off-farm location. You can add more rows by 'right clicking' in the box and selecting "Insert > Insert Rows Below".

27. Eggs

☐ Yes ☐ No ☐ Don't know

Destination/ name	Truck and equipment C&D when leaving? (Yes/No)	Truck and equipment C&D before returning? (Yes/No)	Personnel enter bird housing? (Yes/No)

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

28. Live Birds

☐ Yes ☐ No ☐ Don't know

Off-farm location/ name	Truck and equipment C&D when leaving? (Yes/No)	Truck and equipment C&D before returning? (Yes/No)

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

29. Feed trucks (that haul feed originating on your premises and deliver feed to off-farm locations.

This question does not refer to feed trucks that bring feed onto your premises from other off-farm locations which was previously covered in question 15).

☐ Yes ☐ No ☐ Don't know

Off-farm location/ name	Truck and equipment C&D when leaving? (Yes/No)	Truck and equipment C&D before returning? (Yes/No)	Personnel enter your bird housing? (Yes/No)

Additional Comments: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Movements OFF the farm (continued)**

30. Farm personnel or equipment used to haul manure/used litter to off-farm locations.  
know

☐ Yes ☐ No ☐ Don't know

Off-farm location/ name	Truck and equipment C&D when leaving? (Yes/No)	Truck and equipment C&D before returning? (Yes/No)	Personnel enter your bird housing? (Yes/No)

Additional Comments: \_\_\_\_\_

---

---

31. Farm personnel or equipment used for catch/vaccination/beak trim at off-farm locations.

☐ Yes ☐ No ☐ Don't know

Off-farm location/ name	Truck and equipment C&D when leaving? (Yes/No)	Truck and equipment C&D before returning? (Yes/No)

Additional Comments: \_\_\_\_\_

---

---

32. Farm personnel or equipment used for off-farm carcass disposal.

☐ Yes ☐ No ☐ Don't know

Off-farm location/ name	Truck and equipment C&D when leaving? (Yes/No)	Truck and equipment C&D before returning? (Yes/No)	Personnel enter your bird housing? (Yes/No)

Additional Comments: \_\_\_\_\_

---

---

# Appendix H

## Examples of Movement Control Notices

---

This appendix provides two examples—Federal and State—of halting movement of animals during a disease outbreak.

### EXAMPLE—WEST VIRGINIA

#### **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: [http://www.wvagriculture.org/news\\_releases/2007/7-9-07.html](http://www.wvagriculture.org/news_releases/2007/7-9-07.html)

## EXAMPLE—FEDERAL

Source: <http://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](mailto: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 I

## Available AI Vaccines

---

### Information About Vaccine

This section provides general information about two types of AI vaccine that might be used during an outbreak response effort.

#### LIVE RECOMBINANT VACCINE

Live recombinant vaccine requires subcutaneous injection of individual 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. Use in any animal besides chickens must be considered experimental. This should be weighed when considering the use of vaccine in off-label species.

The recommended dosage is 0.2 ml per bird. Withdrawal time prior to slaughter is 21 days (3 weeks).

#### KILLED VACCINE

Inactivated AI vaccine is an oil-emulsion product requiring subcutaneous injection of individual birds. The killed AI virus is not safe for birds that are less than 2 weeks old. Use in any animal besides chickens must be considered experimental, which should be weighed when considering its use in off-label species. The killed vaccine may provide some cross-protection depending on the outbreak strain of virus, but this must always be evaluated at the time of the outbreak. Maternal antibodies can be passed to progeny, resulting in seropositive test results in progeny for a period.

The recommended dosage is 0.5 ml per bird. A pre-vaccination AI test is required. Only flocks that are negative within the previous 4 days are eligible for vaccination. Withdrawal prior to slaughter is 42 days (6 weeks).

# 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 management system with a distinct health status with respect to a specific disease or specific diseases for which required surveillance, 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)	Document used to identify veterinary functions 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 local, State, and Federal 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)	<ol style="list-style-type: none"> <li>(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;</li> <li>(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</li> <li>(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.</li> </ol>
Highly pathogenic notifiable avian influenza (HPNAI) (OIE)	HPNAI 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 HPNAI isolates, the isolate being tested should be considered as HPNAI.
Incident Command System	<p>A standardized, on-scene, all-hazards incident management approach that</p> <ul style="list-style-type: none"> <li>◆ allows for the integration of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure;</li> <li>◆ enables a coordinated response among various jurisdictions and functional agencies, both public and private; and</li> <li>◆ establishes common processes for planning and managing resources.</li> </ul>



Incubation period (OIE)	For the purposes of the OIE <i>Terrestrial Code (2012)</i> the incubation period for NAI 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 notifiable avian influenza (LPNAI) (OIE)	All influenza A viruses of H5 and H7 subtype that are not HPNAI 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.
Modified stamping-out policy	Animal health measures for stamping-out that are not implemented in full.
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.
Notifiable avian influenza (NAI)	An infection of poultry caused by any influenza A virus of the H5 or H7 subtypes or by any AI virus with an IVPI greater than 1.2 (or as an alternative at least 75 percent mortality). NAI viruses can be divided into HPNAI or LPNAI.
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 178 (August 2012) 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 slaughter	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 cause 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, often by bleeding.
Stamping-out (OIE)	Means carrying out under the authority of the Veterinary Authority, on confirmation of a disease, 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 of a kind likely to cause the transmission of the causal pathogen. All susceptible animals, vaccinated or unvaccinated, on an infected premises should be killed and their carcasses destroyed by burning or burial, or by any other method which will eliminate the spread of infection through the carcasses or products of the animals killed.
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
AC-EIA	antigen capture enzyme immunoassay
AGID	agar gel immunodiffusion
AHPA	Animal Health Protection Act
AI	avian influenza
APHIS	Animal and Plant Health Inspection Service
APHIS-WS	Animal and Plant Health Inspection Service Wildlife Services
ARP	At-Risk Premises
AVIC	Area Veterinarian in Charge
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
CFR	Code of Federal Regulations
CP	Contact Premises
CVO	Chief Veterinary Officer of the United States (VS DA)
CVZ	Containment Vaccination Zone
DF	disease freedom
DHS	Department of Homeland Security
DIVA	differentiation of infected from vaccinated animals
DOI	Department of Interior
EM&D	Emergency Management and Diagnostics
EMC	Egg Movement Control

---

EMLC	Emergency Management Leadership Council
EMRS	Emergency Management Response System
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
EQS	Emergency Qualification System
ESF	Emergency Support Function
FA	Free Area
FAD	foreign animal disease
FADDL	Foreign Animal Disease Diagnostic Laboratory (Plum Island, NY)
FAD PReP	Foreign Animal Disease Preparedness and Response Plan
FAST	Federal and State Transport (Eggs Plan)
FEMA	Federal Emergency Management Agency
FFS	Federal-to-Federal support
FP	Free Premises
H or HA	hemagglutinin
H5N1	HPAI subtype
HHS	Department of Health and Human Services
HPAI	highly pathogenic avian influenza
HPNAI	highly pathogenic notifiable avian influenza
IC	Incident Command
ICG	Incident Coordination Group
ICP	Incident Command Post
ICS	Incident Command System
IMT	Incident Management Team
IP	Infected Premises
IT	information technology
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
LPNAI	low pathogenic notifiable avian influenza
MAC	Multiagency Coordination Group
MP	Monitored Premises
N or NA	neuraminidase
NAADSM	North American Animal Disease Spread Model
NAHEMS	National Animal Health Emergency Management System
NAHERC	National Animal Health Emergency Response Corps
NAHLN	National Animal Health Laboratory Network
NAI	notifiable avian influenza
NCAHEM	National Center for Animal Health Emergency Management
NGO	non-governmental organization
NIMS	National Incident Management System
NPIP	National Poultry Improvement Plan
NRF	National Response Framework
NSU	National Surveillance Unit
NVS	National Veterinary Stockpile
NVSL	National Veterinary Services Laboratories
OIE	World Organization for Animal Health
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
RT-PCR	reverse transcriptase polymerase chain reaction
SAHO	State Animal Health Official
SES	Secure Egg Supply
SITC	Smuggling Interdiction and Trade Compliance
SOP	standard operating procedures
SP	Suspect Premises
SZ	Surveillance Zone
USDA	U.S. Department of Agriculture

---

VDACS	Virginia Department of Agriculture and Consumer Services
VP	Vaccinated Premises
VS	Veterinary Services
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*.

APHIS-USDA. *Summary of the National Highly Pathogenic Avian Influenza (HPAI) Response Plan*. 2007.

APHIS-USDA. *Highly Pathogenic Avian Influenza: A Threat to US Poultry*. 2001.  
[http://www.aphis.usda.gov/publications/animal\\_health/content/printable\\_version/pub\\_ahhpaipdf](http://www.aphis.usda.gov/publications/animal_health/content/printable_version/pub_ahhpaipdf)

APHIS-USDA. *Emergency Mobilization Guide*. 2009.

AUSVET. *Australian Veterinary Emergency Plan: Disease Strategy Avian Influenza*. Version 3.3. 2008. <http://www.animalhealthaustralia.com.au>.

Canadian Food Inspection Agency (CFIA). *Notifiable Avian Influenza Hazard Specific Plan*. May 2007.

Code of Federal Regulations. Title 9 CFR Chapter 1, Part 53.  
[http://www.access.gpo.gov/nara/cfr/waisidx\\_10/9cfr53\\_10.html](http://www.access.gpo.gov/nara/cfr/waisidx_10/9cfr53_10.html).

Code of Federal Regulations. Title 9 CFR Chapter 1, Part 56.  
[http://www.access.gpo.gov/nara/cfr/waisidx\\_10/9cfr56\\_10.html](http://www.access.gpo.gov/nara/cfr/waisidx_10/9cfr56_10.html).

Easterday, B.C., Hinshaw, V.S., and Halvorson, D.A. *Influenza*. (Ames, IA: Iowa State University Press, 1997).

Federal Emergency Management Agency (FEMA). *National Response Framework* (NRF). 2008. <http://www.fema.gov/emergency/nrf/>.

Federal Emergency Management Agency (FEMA). *National Incident Management System* (NIMS). 2008. <http://www.fema.gov/emergency/nims/>.

Gelb, J., and Ladman, B. (2006). Appropriate Applications of Agent and Antibody Detection in AI Surveillance. High Path Avian Influenza Workshop, April 27, 2006.

Scott, A., Zepeda, C., Garber, L., Smith, J., Swayne, D. et al. "The concept of compartmentalization." *OIE Rev Sci Tech*, 25(3).

- 
- Spackman, E. (2006). Personal communication with NSU. US Department of Agriculture, Agriculture Research Service, Southeast Poultry Research Laboratory.
- Swayne, D.E. "Epidemiology of Avian Influenza in Agricultural and Other Man-Made Systems." In D.E. Swayne, ed., *Avian Influenza*. (Ames, IA: Blackwell Publishing, 2008).
- Swayne, D.E. "High Pathogenicity Avian Influenza in the Americas." In D.E. Swayne, ed., *Avian Influenza*. (Ames, IA: Blackwell Publishing, 2008).
- Swayne, D.E. and C. Thomas. "Trade and Food Safety Aspects for Avian Influenza Viruses." In D.E. Swayne, ed., *Avian Influenza*. (Ames, IA: Blackwell Publishing, 2008).
- UN Food and Agriculture Organization (FAO). *Manual on the preparation of national animal disease emergency preparedness plans*. 1999. <http://www.fao.org/docrep/004/x2096e/x2096e00.htm>.
- UN Food and Agriculture Organization (FAO). *Understanding Avian Influenza*. Animal Production and Health Division. 2010. [http://www.fao.org/avianflu/documents/key\\_ai/key\\_book\\_preface.htm](http://www.fao.org/avianflu/documents/key_ai/key_book_preface.htm).
- Weaver, J.T., Grogan, K.B., Trampel, D., McDonald, R., Tilley, B. et al. "2006 High Pathogenicity Avian Influenza Workshop for Poultry Industry, State, and Federal Government Stakeholders." *Surveillance Working Group*.
- World Health Organization (WHO). *Cumulative Number of Confirmed Avian Influenza A (H5N1) Reported to WHO*. 2012. [http://www.who.int/influenza/human\\_animal\\_interface/H5N1\\_cumulative\\_table\\_archives/en/index.html](http://www.who.int/influenza/human_animal_interface/H5N1_cumulative_table_archives/en/index.html).
- World Organization for Animal Health (OIE). *Terrestrial Animal Health Code*. Chapter 10.4: Avian Influenza. 2012. <http://www.oie.int>.
- World Organization for Animal Health (OIE). *Terrestrial Animal Health Code*. 2012. <http://www.oie.int>.
- World Organization for Animal Health (OIE). *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*. 2012. <http://www.oie.int>.
- World Organization for Animal Health (OIE). *Highly Pathogenic Avian Influenza*. Technical Disease Card. 2009. <http://www.oie.int>.
- Writing Committee of the World Health Organization (WHO) Consultation on Human Influenza A/H5. 2005. "Avian Influenza A (H5N1) Infection in Humans." *The New England Journal of Medicine*. 353: 1374–85.