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Service

Veterinary Services

Emergency Management
and Diagnostics

Summary of the National Highly Pathogenic Avian Influenza (HPAI) Response Plan



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I. Introduction

Avian influenza (AI) is an infection of birds caused by a type A influenza virus. AI viruses are classified as either highly pathogenic AI (HPAI) or low pathogenic AI (LPAI), based on the genetic features of the virus and the severity of disease in poultry. While most AI viruses are LPAI and usually result in mild or asymptomatic infections, HPAI viruses are associated with morbidity and mortality rates of up to 100 percent in poultry.

Of primary concern is HPAI H5N1 which is spreading throughout Asia, Europe, and Africa (subsequently referred to as HPAI H5N1), a particularly virulent strain of AI virus that has killed wild birds and commercial poultry and infected a limited number of humans since its emergence in Asia in 1996. In addition to poultry, mortality from HPAI H5N1 has been reported in many species of wild birds worldwide. All current evidence indicates that close contact with dead or sick birds is the principal source of human infection with the HPAI H5N1 virus. Most cases of human infection with HPAI H5N1 have occurred in rural and periurban households where small flocks of backyard poultry are kept. This strain of HPAI H5N1 has not yet been detected in the Western hemisphere.

The U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS), in cooperation with Federal partners including the Department of the Interior (DOI) and the Department of Health and Human Services (HHS), has developed a national response plan for quickly and effectively responding should HPAI occur in the United States. This document is a summary and abstract of the detailed (1,100 page) National Highly Pathogenic Avian Influenza (HPAI) Response Plan. ***The plan is intended to complement regional, State, and industry plans that are written to be more specific to local issues and needs. States should continue to develop plans that are specific to their poultry industry and requirements.***

This is a living document and will evolve as we gain additional information and communicate further with our partners and stakeholders. This plan replaces the August, 2006, version of the document.

USDA has developed a comprehensive Communications Emergency Response Plan that is described in brief in section IV of this document. The full plan will be shared with Federal, State, and industry entities in order to coordinate media and public response to any possible HPAI H5N1 detection. Included in the plan are key messages addressing public concerns regarding AI that will be delivered by all involved entities. The plan also includes provisions to hold daily media briefings to keep the public informed of ongoing activities.

USDA has a variety of prevention and preparedness activities ongoing both internationally and domestically. Internationally, USDA is collaborating with the U.S. Agency for International Development (USAID) and HHS to prevent and control HPAI H5N1 where it currently exists. This strategy assumes that the best way to protect animal and public health is to address the virus at its source. Domestically, USDA is working to prevent and control all H5 and H7 AI viruses in U.S. commercial broilers, layers, and turkeys; their respective breeders; backyard flocks; and the live bird marketing system (LBMS). In addition to import restrictions and activities to prevent

illegal entry of poultry and poultry products, a major component of the domestic program is surveillance, both in domestic poultry and wild birds.

If HPAI, including HPAI H5N1, is detected in the United States, USDA will implement a foreign animal disease emergency response tailored to the specific details of the detection; e.g., if the detection is in domestic poultry or birds versus in a wild bird. USDA's emergency response system framework, which is described in this plan, includes the National Response Plan, the National Incident Management System (NIMS), and APHIS' National Animal Health Emergency Management System (NAHEMS). This framework integrates the capabilities and resources of the Federal Government, States, Tribal Nations, local communities, and private organizations.

USDA's National HPAI Response Plan includes standard operating procedures after a laboratory finding of HPAI. Field operation guidelines for emergency responders address roles and responsibilities, quarantine and movement controls, appraisal and compensation, euthanasia, disposal, cleaning and disinfection, biosecurity, and wildlife management. Finally, the response plan provides for the stockpiling and use of personal protective equipment (PPE) for AI responders.

A. Background

Scientific Aspects of AI Viruses

Worldwide, there are many strains of the AI virus that can cause varying manifestations of clinical illness in poultry. AI viruses can infect chickens, turkeys, pheasants, quail, ducks, geese, and guinea fowl, as well as a wide variety of other birds, including migratory waterfowl. This virus changes rapidly in nature by mixing its genetic components to form slightly different virus subtypes. There are 144 potential characterizations of the AI virus based on two proteins found on the surface of the virus. One is the hemagglutinin protein (H), of which there are 16 different types (H1–H16); the other is the neuraminidase protein (N), of which there are 9 different types (N1–N9).

AI viruses are classified as either HPAI or LPAI, based on the genetic features of the virus and the severity of disease caused in poultry. Most AI strains are classified as LPAI and cause mild or asymptomatic infections in birds. In contrast, HPAI causes a severe and extremely contagious illness and death among infected birds. Mortality rates for birds affected by an HPAI outbreak can be as high as 100 percent, and any surviving birds are usually in poor condition. While LPAI infections are typically mild, some low pathogenic subtypes—the H5 and H7 strains—have the capacity to mutate into highly pathogenic strains. LPAI poses no known serious threat to human health. However, some strains of AI viruses can be infectious to people under conditions of high exposure from handling, dressing, or consuming improperly prepared and undercooked sick or dead poultry.

LPAI is occasionally detected in domestic poultry flocks with no significant effect on poultry. HPAI is rare, and there is no evidence that it currently exists in the United States. Historically, there have been three HPAI outbreaks in poultry in this country in 1924, 1983, and 2004. All

three of these HPAI outbreaks were associated by epidemiological investigation with LBMS resulting in no significant human illness. Furthermore, the most recent outbreak in 2004 was quickly detected and eradicated. Because of the quick response, the disease was limited to 1 flock of 6,600 birds and 2 live bird markets.

Since December 2003, an increasing number of countries have reported outbreaks of an HPAI H5N1 virus in poultry. The unique aspect of this particular virus is that it has been transmitted from birds to humans, most of whom had reported extensive direct contact with infected birds. At present, the United States does not have HPAI H5N1 and does not import live poultry from countries and/or regions currently experiencing HPAI H5N1 outbreaks in commercial or traditionally raised flocks. However in accordance with OIE, trade may continue outside of “APHIS, Veterinary Services defined restricted zones” established within countries that have demonstrated adequate veterinary infrastructure and authority; movement and disease control measures; and veterinary field activities for HPAI outbreak response.

Sources of AI Infection

AI viruses are most often found in migratory waterfowl, which appear to be the largest natural reservoirs for the influenza A viruses. The wild bird reservoir of AI viruses should be considered a major source of infection for domestic birds, particularly free and open range poultry, and it is important to reduce the contact between such domestic birds and wild birds. Live bird markets are another important potential source of influenza virus for commercial poultry. Smuggling of live birds circumvents safeguards and poses unique risks and unprotected pathways for disease spread.

Transmission of the Virus

AI is spread primarily by direct contact between healthy and infected birds and by indirect contact with contaminated equipment and materials. The virus is excreted from infected birds through feces and secretions from the nose, mouth, and eyes. Contact with infected fecal material is the most common means of bird-to-bird transmission. Wild ducks may introduce LPAI into domestic flocks raised on the range or in open flight pens through fecal contamination. Within a poultry house, transfer of the HPAI virus between birds can also occur via airborne secretions. The spread of AI between poultry premises almost always follows the movement of contaminated people and equipment. AI can also be found on the outer surfaces of egg shells; therefore, movement of eggs is a potential means of AI transmission. Airborne transmission of virus from farm-to-farm is highly unlikely under usual circumstances.

The incubation period for AI ranges from 1 to 10 days depending on the isolate (subtype and pathogenicity), dose, species, and age. The potential for viral shedding may range up to 21 days and should be considered the infective period for exposure and transmission of the disease. (See World Organization for Animal Health [OIE] definitions page)

Clinical Signs

Infections among domestic poultry result in a variety of disease syndromes that range from sub-clinical asymptomatic infections to generalized fatal disease. Signs of infection from LPAI subtypes are typically unnoticed or mild. Decreased food consumption, respiratory signs (coughing and sneezing), and a decrease in egg production might demonstrate the presence of the

disease. Domestic poultry that are affected with HPAI subtypes experience a more severe clinical illness and may die suddenly, resulting in high levels of mortality within a production flock. Flocks infected with high pathogenicity subtypes could exhibit one or more of the following clinical signs: lack of energy and appetite; decreased egg production; soft-shelled or misshapen eggs; swelling of head and legs; purple discoloration of comb, wattles, or legs; nasal discharge; coughing and sneezing; lack of coordination; and diarrhea.

Diagnosis

AI may be diagnosed based on clinical signs and gross or microscopic pathologic lesions in combination with laboratory diagnostic tests. The main screening test used for early detection of HPAI is real-time reverse transcriptase polymerase chain reaction (RRT-PCR). RRT-PCR is a rapid method of identifying the virus, typically producing results within 4 to 7 hours. The advantages of using RRT-PCR for surveillance during an outbreak are the rapid turnaround time compared with virus isolation (VI) and the relatively high sensitivity and specificity.

Oropharyngeal/tracheal swabs (for gallinaceous birds) and cloacal swabs (for waterfowl) are the preferred samples for virus detection tests. Swab samples are submitted to USDA-approved laboratories where RRT-PCR is run as part of the National Animal Health Laboratory Network (NAHLN). When samples elicit a positive result on RRT-PCR, they are forwarded to the National Veterinary Services Laboratories (NVSL) for confirmatory testing.

Confirmatory tests are much more specific and are used to verify the presence of AI, verify the identity of specific viral subtypes, and evaluate virus pathogenicity. These definitive tests involve isolating the virus in embryonated chicken eggs, which then provide the material to allow detailed identification of the strain of the virus and determine whether it is HPAI or LPAI. Confirmatory test results can usually be expected within 5 to 10 days. (See CVB/NVSL Standard Operating Procedure for Laboratory Diagnosis of Highly Pathogenic Avian Influenza.)

Control and Cleanup

When HPAI outbreaks occur in poultry, the preferred eradication and control methods are quarantine, enforcement of movement restrictions, and depopulation (culling) of all infected, exposed, or potentially infected birds, with proper disposal of carcasses and rigorous cleaning and disinfection of farms and surveillance around affected flocks. Chemical and physical measures such as heat, extremes of pH, and dryness can inactivate AI viruses. In addition, AI viruses are inactivated by organic solvents and detergents (a full list of Environmental Protection Agency [EPA]-approved disinfectants with efficacy against avian influenza can be found in Appendix A).

Communications

Communications are an integral part of the preparedness and response plans. USDA's Office of Communications will coordinate the flow of information; and provide liaison between USDA agencies, mission areas, other federal agencies and the mass communication media, state and local governments, and the public; and conduct operations from a USDA Joint Information Center (JIC) during a highly pathogenic H5N1 avian influenza emergency. If a case is identified, USDA will hold media briefings and work with its partners to communicate information to poultry owners, pet bird owners, hunters, and other interested persons on appropriate measures they can take to protect their livestock and themselves. It will be a priority

to impart to the public that a detection of HPAI in wild birds or poultry does not signal the start of a human pandemic. Messages have already been prepared through collaboration with Federal, State, and local entities and are included in USDA's Office of Communications Highly Pathogenic Avian Influenza Emergency Response Plan (section IV).

B. USDA's Role in National and International Prevention and Control of HPAI

Prevention, Preparedness, and Surveillance

USDA has both international and domestic roles in controlling HPAI in birds and reducing its effects on the economy and public health. Internationally, USDA is collaborating with the USAID and HHS to prevent, control, and eradicate HPAI where it currently exists. Domestic program goals are (1) prevention and control of H5 and H7 LP AI in U.S. poultry and the LBMS to prevent the possible mutation of LP AI into HPAI viral strains; and (2) to increase surveillance of wild birds to rapidly detect and prevent spread of any HPAI viral strains to domestic poultry.

International Activities

APHIS' international strategy assumes that the best way to protect poultry and public health is to control the HPAI H5N1 and other HPAI viral strains at their source in the birds of affected countries. Reducing virus load in birds will reduce the opportunities for this virus to mutate or contribute genetic material for recombination.

Through collaboration with USAID and Foreign Agricultural Service (FAS), APHIS provides in-country training and capacity building in affected countries. USDA is working to establish the veterinary health frameworks necessary to reduce outbreaks of HPAI in birds. These experts will conduct training, coordinate sampling, and help preserve the framework for effective HPAI control and eradication in birds. This will be carried out through "train-the-trainer" exercises and seminars in countries that are affected. These APHIS activities will help reduce the risk of HPAI H5N1 entering the United States.

Responses to international trade disruptions

USDA, in collaboration with the Department of State and USTR, will promptly address foreign governments which impose unjustifiable U.S. poultry and product trade restrictions because of an HPAI case.

USDA overseas Embassy offices have also been given guidance how to rapidly report to Washington, D.C. headquarters of any such trade disruptions and also help respond to foreign officials. Multiple USDA agencies are in coordination led by FAS, yet also in communications with the U.S. industry of any such trade disruptions. USDA's APHIS would also quickly provide any foreign official requests for additional scientific U.S. HPAI domestic poultry flock case surveillance, control, and laboratory diagnostics.

These efforts focus on whenever bans are inconsistent with World Organization for Animal Health (OIE) and WTO SPS standards, as well as any U.S. AI bilateral protocols. OIE member countries, like the U.S., are required via USDA APHIS to “immediately” notify OIE of any confirmed HPAI U.S. case (commercial poultry, backyard flocks, wild birds, live bird markets), or confirmed LPAI H5 or H7 case in commercial poultry; we also must notify some foreign governments under AI bilateral protocols. International standards for HPAI poultry cases allow countries to impose bans on exports up to three months. This scope of ban should be limited to the OIE “zone” or “compartmentalized” area (U.S. quarantining, culling, region monitoring, disinfecting, confirmatory testing if poultry farm is AI virus-free). USDA provides to OIE and foreign governments U.S. HPAI case compartmentalized area status updates to minimize scope of ban or on route shipment disruptions.

Domestic Activities

APHIS has taken action to prevent the introduction of HPAI into the United States, to detect the presence of H5 or H7 LPAI, and to ensure preparedness to respond in the event of an outbreak. In addition to import restrictions on poultry and poultry products from all countries and/or regions affected by HPAI in commercial or traditionally raised flocks, USDA’s domestic surveillance and preparedness program consists of the following components:

Wildlife Surveillance (Migratory Flyways, and Wildfowl)

USDA, APHIS, Wildlife Services, will lead an interagency effort, that includes Department of Interior and the Department of Health and Human Services, to detect HPAI in wild birds and will coordinate with the ongoing activities of universities, States, and other entities. The initiative is divided into two phases. The initial phase addresses early detection activities in Alaska, particularly coastal areas with high potential for contact among wild fowl from North American and Asian flyways. The second phase addresses HPAI detection activities in four major North American flyways. The plan includes several interrelated components, including the investigation of wild bird deaths or sickness, the sampling of live-captured and hunter-harvested birds, the use of sentinel species, and environmental sampling.

Domestic Bird Surveillance and Diagnostics

APHIS has a two-pronged approach to AI surveillance. The first is through the National Poultry Improvement Plan (NPIP). The NPIP is a voluntary industry-State-Federal cooperative program that conducts AI surveillance in two major sectors of the commercial poultry industry:

- (1) Egg- and meat-type chicken and turkey breeding flocks, exhibition poultry breeding flocks, upland game bird breeding flocks, game fowl breeding flocks, and other species of hobby poultry breeding flocks (e.g., peafowl and guinea fowl);
- (2) Commercial table-egg layer chickens, meat-type chickens (broilers, roasters, fryers, and Cornish) and meat-type turkeys.

The NPIP has encouraged the addition of raised-for-release upland game birds to the program. A proposed change was accepted by the delegates at the NPIP Biennial Conference in September 2006. Pending official rulemaking, surveillance would be initiated in this group of birds as well

as raised-for-release waterfowl, and commercial waterfowl and upland game birds. The State Animal Health Officials or Official State Agencies of the NPIP are periodically conducting surveillance in bird auctions, flea markets, swap meets, and public exhibitions.

The second approach is AI surveillance in the LBMS. APHIS is currently cooperating with 21 States that are conducting surveillance in their LBMS using a system of uniform standards established by an industry-State-Federal working group. The LBMS deals with many types of poultry that originate from multiple sources. In conjunction with the NPIP, this system achieves broad-based surveillance. APHIS has gradually increased its support for surveillance for AI in LBMS across the country.

Routine surveillance tests used for screening flocks for recent AI infection focus on antibody detection to influenza A viruses. These screening tests are designed to be broadly sensitive in order to identify exposure to any influenza A virus. Some screening tests can identify viral subtypes, specifically H5 and H7. Examples of serologic screening tests include agar gel immunodiffusion and enzyme linked immunosorbent assay. Recent infection can be detected using antigen tests, such as RRT-PCR and commercially available influenza A antigen detection tests.

Smuggling Interdiction and Trade Compliance (SITC)

APHIS' Plant Protection and Quarantine's SITC unit conducts risk management and anti-smuggling activities to prevent the unlawful entry and distribution of prohibited agricultural commodities. Specifically, SITC is looking at domestic markets that are likely to have illegally imported avian products to establish baseline information on how much product is bypassing ports of entry. Additionally, SITC will continue intelligence gathering, targeting likely shippers and importers of prohibited products, and cooperating with other agencies to conduct large-scale inspection operations at ports of entry.

National Center for Import Export (NCIE)

All live birds, except from Canada, are quarantined for at least 30 days in a USDA approved quarantine facility. All live birds are also tested for AI. Pet birds returning from H5N1-affected 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 with the exception of hatching eggs from Canada and from END-free countries. NCIE restricts the imports of all poultry, poultry products and hatching eggs from all countries affected by HPAI H5N1. In accordance with OIE, trade may continue outside of "APHIS, Veterinary Services defined restricted zones" established within countries that have demonstrated adequate veterinary infrastructure and authority; movement and disease control measures; and veterinary field activities for HPAI outbreak response.

Returning US origin pet birds from all countries except Canada are required to be home quarantined for 30 days and tested for AI. Returning US origin pet birds from HPAI H5N1 affected countries must be quarantined in a USDA quarantine facility for 30 days and tested for AI.

Animal Care

The division of Animal Care is working with the American Zoological Association (AZA) and non-AZA facilities that fall under Animal Care jurisdiction to establish effective surveillance plans at their premises. Participating facilities will undertake active and passive surveillance of apparently healthy exhibit and wild birds on their premises. AZA zoos already perform diagnostic analyses on all livestock that die on their grounds, and AI testing will be included among the tests performed.

Laboratory Support and Diagnostics

APHIS' NVSL will provide support to the NAHLN for sample processing by conducting RRT-PCR from the wildlife, commercial, upland game birds, waterfowl, and the live bird marketing segments of the domestic AI surveillance program. USDA will sequence the genome of AI isolates collected in the surveillance effort to characterize them as high or low pathogenicity, Asian or North American groupings, etc. APHIS' Center for Veterinary Biologics (CVB) will more quickly review data packages concerning the licensure of new products (diagnostic test kits and vaccines) for AI.

Biosecurity

USDA, APHIS, will expand its "Biosecurity for the Birds" program (on the Web at <http://www.aphis.usda.gov/vs/birdbiosecurity/>) to promote best practices in the LBMS and backyard flock situations in addition to its educational efforts with the U.S. commercial poultry industry.

Preparedness

USDA will use an enhanced version of the North American Animal Disease Spread Model (NAADSM) to develop computer-generated scenarios for HPAI. The NAADSM will be used to evaluate the potential consequences of HPAI incursions in United States and North American poultry and project controls, countermeasures, and materials and supply needs, including reagents and vaccines, needed in the National Veterinary Stockpile (NVS). The NVS will acquire, configure, and maintain critical veterinary supplies to ensure deployment within 24 hours of an adverse event.

USDA, APHIS, will also work to assist States in organizing, training, and equipping both the State Incident Management Teams and Veterinary Reserve Corps. State groups will operate as an early response system for an introduction of HPAI and, in coordination with USDA, APHIS, may educate wildlife and domestic poultry groups on the signs and symptoms of HPAI and reporting procedures. In addition, USDA, APHIS, will identify and contract with pre-qualified vendors who can supplement initial responders at an outbreak site.

C. National Emergency Response**1. Emergency Response Framework**

USDA has taken aggressive steps to protect our Nation by integrating the capabilities and resources of the Federal Government, States, Tribal Nations, local communities, and private organizations into a seamless National Emergency Management System. The policy framework

of the system includes the National Response Plan, the Incident Command System (ICS), NIMS, and the NAHEMS. Additional information is available at the following Web sites:

- National Response Plan: <http://www.dhs.gov/xlibrary/assets/NRPbaseplan.pdf>.
- NIMS: <http://www.fema.gov/emergency/nims/>.
- ICS: <http://training.fema.gov/EMIWeb/IS/is100.asp>.

2. NAHEMS and Legal Authority

The Animal Health Protection Act (AHPA) provides the authority for the Secretary to prevent, detect, control, and eradicate diseases, such as HPAI, and pests of birds and other livestock to protect animal health, the health and welfare of people, economic interests of livestock and related industries, the environment, and interstate and foreign commerce in birds, other livestock, and other articles. The AHPA gives the Secretary a broad range of authorities to use in the event of an outbreak of HPAI in the United States and to prevent its introduction into the United States. The Secretary is specifically authorized to carry out operations and measures to detect, control, or eradicate any pest or disease of livestock, including poultry, and to promulgate regulations and issue orders to carry out the AHPA. The Secretary may prohibit or restrict the importation, entry, or interstate movement of any animal, article, or means of conveyance to prevent the introduction into or dissemination within the United States of any pest or disease of livestock. In certain specified circumstances, the Secretary may declare an extraordinary emergency to regulate intrastate activities or commerce. The Secretary has 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.

Following the principles of the National Response Plan and NIMS, USDA, APHIS, has established the NAHEMS that provides an operational framework for response to foreign animal disease emergencies such as HPAI outbreaks.

NAHEMS guidelines are designed for use at any of three levels of response commensurate with the severity of the outbreak. These levels include:

- *A local/limited response:* Managed by local, State, Federal, and industry officials, with primary response coordination at the State and regional levels with national-level consultation, consequence management (e.g., trade issues), and communication and public relations.
- *A regional response:* Managed by local, State, Federal, and industry officials and possibly the State emergency management agency as specified in State animal health emergency response plans. National-level crisis management, response coordination, communication and public relations, consultation, and consequence management are required.
- *A national response:* Requires the combined efforts of local, State, industry, and Federal agricultural officials as well as nonagricultural government personnel (e.g., the Federal Emergency Management Agency) and the private sector for national-level crisis management, response coordination, consultation, communication and public relations, and consequence management.

Topics covered in the NAHEMS guidelines include:

- Field investigations of animal health emergencies;
- Animal emergency response using the ICS;
- Disease control and eradication strategies and policies;
- Operational procedures for disease control and eradication;
- Site-specific emergency management strategies for various types of facilities;
- Administrative and resources management; and
- Educational resources and public communication.

NAHEMS includes a “Leader’s Guide for Conducting Animal Emergency Response Using the Incident Command System” to assist with effective management. This includes a systematic approach to identifying human and material resources needed at the incident site based on the size and complexity of the incident. Categories range from a Type 5 Incident, which is contained in a comparatively short time with comparatively minor levels of resources, to a Type 1 incident, which can be contained only with significant human and material resources that are committed for a longer time period.

D. Diagnostic Resources – NVSL and NAHLN

NVSL performs animal disease testing in support of USDA, APHIS, programs designed to protect the health of the Nation’s poultry and livestock. NVSL, the only Federal facility in the United States dedicated to the diagnosis of both domestic and foreign animal diseases, uses state-of-the-art diagnostic techniques to rapidly determine what disease agent is present and what risk it presents to U.S. animal health. NVSL also is recognized as an international reference laboratory for AI by the OIE. NVSL provides assistance to State and other Federal agencies and laboratories, educational institutions, and foreign governments in the diagnosis of animal diseases through training and reagents and conducts developmental projects for rapidly advancing technologies.

The NAHLN was created through the cooperation of USDA’s Cooperative State Research, Education, and Extension Service, APHIS, and the American Association of Veterinary Laboratory Diagnosticians. More than 45 laboratories participate in the network. NAHLN coordinates the veterinary diagnostic laboratory capacity of State animal health laboratories and their extensive infrastructure—facilities, equipment, and professional expertise. Specific features of NAHLN are the use of standardized rapid diagnostic techniques, trained personnel, modern equipment, proficiency testing, quality standards, secure communication and reporting systems, scenario testing, and appropriate biosafety and biosecurity levels.

The NAHLN will provide the means for early detection, rapid response through surge capacity to test outbreak samples, and appropriate recovery by its capability to test large sample numbers to show freedom of disease. These laboratories provide accessible, timely, accurate, and consistent animal disease laboratory services nationwide; provide laboratory data to meet epidemiological and disease reporting needs; respond to foreign animal disease outbreaks or other adverse animal

health events (including bioterrorism events); and focus on diseases (including exotic, zoonotic, and emerging diseases) of livestock, birds, and other livestock.

Response actions will begin upon receipt of a presumptive or positive result on a screening test for HPAI virus in a domestic or wild bird. NVSL will provide confirmatory testing for HPAI on all specimens found presumptively positive at a NAHLN laboratory or other USDA-approved laboratory. Additional actions will be taken after a presumptive positive diagnosis from the NVSL, and a full response will be initiated after a NVSL-confirmed positive diagnosis. The response actions specified in this plan to a presumptive or confirmed HPAI case will be tailored to the circumstances surrounding the outbreak. Responses to HPAI versus H5 or H7 strains of LPAI may differ.

Suspected cases of HPAI will be addressed per current foreign animal disease procedures as detailed in Veterinary Services (VS) Memorandum No. 580.4.

II. Response to HPAI

A. General Response Strategy

The overall goal for response to HPAI is to detect, control, and eradicate the virus as quickly as possible to return individual poultry facilities to normal production and the United States to disease free status.

The United States keeps HPAI out of its domesticated bird and other susceptible livestock populations through preventive measures such as import restrictions, exclusion activities at borders and ports of entry, public education programs, and extensive domestic AI surveillance activities. Should there be an outbreak of HPAI, the USDA and the affected State(s) will work to control and eradicate the disease as expeditiously as possible.

As a member of the OIE, the United States has agreed to abide by standards drafted and approved by member countries. The OIE standard for disease eradication is a “stamping-out” policy. According to the OIE, “stamping-out” means that upon confirmation of HPAI and under the authority of the Veterinary Administration, livestock that is infected, suspected of being infected, and where appropriate, those that has been exposed to infection by direct or by indirect contact is humanely killed. All susceptible livestock, vaccinated or unvaccinated, on an infected premises should be killed and their carcasses destroyed by burning or burial, or by any other method that will eliminate the spread of infection through these carcasses or products. A modified stamping-out policy is one in which the above measures are not implemented in full; modified stamping out may include the use of strategies such as vaccination without subsequent culling.

Control and elimination of HPAI will rely on three basic principles that make up the operational components of a response:

- 1. Preventing contact between birds and other susceptible livestock and HPAI virus.** This is best accomplished by the following measures: quarantine and movement control, biosecurity,

and epidemiological investigation with risk assessment, tracing of domesticated birds and other susceptible livestock movement, and surveillance. Accelerated culling of domesticated birds and other livestock that may be at risk for exposure to an HPAI virus may also be warranted.

2. Stopping the production of HPAI virus by infected birds and other livestock. This is best accomplished through depopulation and disposal of infected and potentially infected (exposed) domesticated birds and other livestock.

3. Increasing the disease resistance of birds and other susceptible livestock. This is accomplished by strategic vaccination.

Strategy for Control and Eradication of HPAI

A response system was developed that quickly detects HPAI and prevents its spread beyond the index premises, thereby minimizing the impact on U.S. poultry and livestock industries and the general public. This may include:

- Rapid diagnosis and reporting
- Swift imposition of effective quarantine
- Prevention of movement of known or potentially contaminated materials
- Stamping out of infected or exposed domesticated birds and other livestock
- Increased surveillance
- Preemptive culling
- Strategic vaccination

This response is best achieved through a control and eradication strategy. This strategy will follow the stamping-out policy of the OIE, utilizing quarantine and movement controls (see “Quarantine and Movement Controls” guidelines) and the early establishment of “zoning” in compliance with internationally recognized standards so that export markets can be reclaimed as early as possible for areas with no infected or contact premises.

When the criteria for a presumptive positive H5 or H7 case have been met (see criteria on p.18), the APHIS Administrator or the Deputy Administrator for Veterinary Services may authorize APHIS personnel to initiate depopulation, cleaning and disinfection of the index case and all related contact premises. APHIS will make an assessment of the need to initiate depopulation, cleaning and disinfection of other poultry flocks in a radius up to 3 km around the index case. In addition, personnel would depopulate birds on any epidemiologically linked premises in contact with the infected premises and any birds with a positive H5/H7 result on the RRT-PCR test performed at a NAHLN approved member laboratory. The depopulation effort would include backyard flocks if there is a clear epidemiologic link to an HPAI infected commercial operation or if there is evidence during increased surveillance efforts of clinically ill birds or increased bird mortality consistent with HPAI.

Vaccination may be used in circumstances where it is determined to assist eradication (see APHIS Vaccination Policy for HPAI). Tracing and surveillance will play an important role in identifying infected and exposed domesticated birds and other susceptible livestock to determine the extent of the outbreak, thus defining the control area(s) and free zone.

Concept of Operations for Control and Eradication of HPAI

The outbreak response should be implemented through an ICS with an appropriate span of control and delegation of authority. Responses should be as local as possible. It is imperative to maintain good communication within the chain of command. An Incident Commander should be identified, and an Incident Command Post should be established. In-state resources (whether State, Federal, Tribal, or privately owned) should be used to manage a local response. Out-of-state resources (State, Federal, Tribal, or privately owned) will be used to support the State affected.

During the investigation of a suspected HPAI event, animal health responders will use clinical signs, history, and professional judgment to determine the likelihood of the existence of HPAI. The assessment of a suspect HPAI event will include 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. These measures will include quarantine and movement control, determination of the extent of the disease through tracing and surveillance, and activation of response plans to communicate these actions to all stakeholders, the public, and the international community. Cooperative Federal, State, and industry response measures will be 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 spread of disease has occurred beyond the initial premises, the premises should be treated as a presumptive positive premises and control measures should be implemented.

B. Surveillance Definitions

Bird is defined as any individual animal belonging to the Phylum Chordata, Subphylum Vertebrata, Class Aves.

OIE Definitions

Poultry is defined in the 2006 OIE Chapter 2.7.12.1 on AI as “all domesticated birds used for the production of meat or eggs for consumption, for the production of other commercial product, for restocking supplies of game, or for breeding these categories of birds.”

Wild birds are any free-ranging avian species not considered poultry as defined by OIE Chapter 2.7.12.1.

Notifiable avian influenza (NAI) is defined in OIE Chapter 2.7.12.1 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 AI (HPNAI) and low pathogenicity notifiable AI (LPNAI):

- a) HPNAI viruses have an IVPI in 6-week-old chickens greater than 1.2 or, as an alternative, result in at least 75 percent mortality in 4- to 8-week-old chickens infected

intravenously. H5 and H7 viruses that 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 hemagglutinin 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.

Incubation period means the longest period that elapses between the introduction of the pathogen into the bird or other animal and the occurrence of the first clinical signs of the disease (in the bird or other animal).

Infective period means the longest period during which an affected bird or other animal can be a source of infection.

Zoning and compartmentalization are procedures implemented by a country under the provisions of OIE Chapter 1.3.5. with a view to defining subpopulations of different animal health status within its territory for the purpose of disease control and international trade. *Zoning*: applied to a subpopulation defined on a geographical basis. *Compartmentalization*: applied to a subpopulation based on management systems and biosecurity.

USDA, APHIS, VS, Centers for Epidemiology and Animal Health, National Surveillance Unit, Definitions

See Appendix C for the USDA, Centers for Epidemiology and Animal Health, National Surveillance Unit, NAI Case Definition.

Case definitions

These case definitions are used to classify premises that may be exposed and/or infected.

Clinical Description: The clinical manifestations and mortality from NAI infections can vary considerably depending on species, age, sex, concurrent infections, virus strain, and environmental conditions. The digestive, respiratory, nervous, reproductive, or circulatory systems may be affected. Surveillance programs may detect NAI infection with no clinical signs.

Clinical Definition of NAI: Flocks of domestic poultry 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, snicking, and dyspnea
- Neurological signs such as incoordination or torticollis
- A drop in feed and/or water consumption
- Swollen or necrotic combs and wattles
- Swollen head and legs
- Subcutaneous hemorrhage of legs
- Lungs filled with fluid and blood

- Tracheitis and airsacculitis
- Petechial hemorrhages on internal organs

AND/OR:

Flocks that experience mortality listed for each compartment:

- Commercial broilers: Mortality exceeding 4 birds per 1,000 per day for 2 consecutive days
- Commercial layers: Four times the normal daily mortality for 2 consecutive days (0.5 per 1,000 per day for layers from 2 to 50 weeks and 0.75 per 1,000 per day for layers over 50 weeks) or 5 percent drop in egg production over 3 days
- Commercial turkeys: Mortality in excess of 2 birds per 1,000 per day
- Backyard flocks: Any sudden and significant mortality event or sudden drop in egg production should be investigated
- Depending on the pathogenicity of the virus, birds raised on litter may experience rapidly spreading mortality. Mortality in birds reared in cages (e.g., layers, quail) may progress more slowly over a 10- to 15-day period

Standard Case Classifications:

Confirmed positive case: A bird or other animal that has clinical signs consistent with HPAI and from which HPAI was isolated and identified in a USDA laboratory or other laboratory designated by the Secretary of Agriculture (see Diagnosis and Reporting below).

Presumptive positive case: A bird or other animal that has clinical signs consistent with HPAI in addition to a positive laboratory result (see Diagnosis and Reporting below) and additional epidemiological information indicative of HPAI.

Suspect case: A bird or other animal that has clinical signs consistent with HPAI.

C. Diagnosis and Reporting

Virus isolation is the definitive test for confirming a positive H5 or H7 AI diagnosis, but because of the time required to perform VI (up to 2 weeks), it is often advantageous to report H5 or H7 presumptive results based on molecular screening tests to facilitate a rapid and appropriate response for disease control and eradication.

The procedures below include information on communicating index cases of H5 or H7 in all avian species. While these procedures must be followed regardless of pathogenicity, the finding of an HPAI virus in any avian species will require additional communication among USDA, DOI, HHS, and the Governor's office of the appropriate State(s), as outlined below.

Diagnostic Testing Methods**Rapid screening test at NAHLN and NVSL**

The rapid screening test for tissue or swabs will be an RRT-PCR assay for H5 or H7 AI viral RNA. These results can be expected within 4 to 7 hours after receipt by NVSL.

Confirmatory testing at NVSL**VI test and H/N subtyping tests**

VI is the gold standard test used to diagnose AI virus infections. The virus is isolated in embryos inside chicken eggs. A series of tests follow to specifically identify H and N subtypes of the AI virus. These tests cannot determine pathogenicity.

Testing to Distinguish H5 and H7

Genetic sequencing test

This test involves determination of the base sequence of the hemagglutinin precursor protein [HA0] cleavage site to identify viruses that have the capacity to become highly pathogenic. These known sequences, such as that of the HPAI H5N1 virus, are stored in databanks.

Chicken pathogenicity test

This test involves the inoculation of 4- to 8-week old disease-free chickens and observation for signs of AI for 10 days. HPAI is defined as any AI virus that is lethal for six or more of eight chickens (75 percent mortality), or has an IVPI greater than 1.2.

Confirmatory AI test results can be expected within 5 to 10 days.

Criteria Contributing to a Presumptive H5 or H7 Diagnosis in any Bird:

- Report of a sudden and significant increase in mortality in a poultry flock, market, zoo collection, or wild bird population with corresponding clinical signs or post mortem lesions or a sudden and significant decrease in egg production in a poultry flock
- Report by NVSL or a NAHLN laboratory, or other USDA-approved laboratory, certified by NVSL to conduct AI diagnostics of any bird or environmental specimen that is positive on the RRT-PCR matrix (M) assay and H5 or H7 assay.

Reporting and Notification of Presumptive H5 or H7 Cases:

Cases that meet both presumptive diagnosis criteria above:

These cases will be considered presumptive HPAI H5 or H7 and will be immediately reported to the OIE, trade partners, other Federal agencies, States, and industry. This may include cases in breeder and commercial poultry flocks, domestic waterfowl and upland game birds, backyard flocks, LBMS, and wild birds. Appropriate Federal-State-industry response and containment measures would be initiated while confirmation is underway at NVSL.

D. Quarantine and Movement Controls

For additional information, see NAHEMS guidelines on “Quarantine and Movement Control.”

1. Basic Principles

Effective quarantine and movement control are essential elements for preventing further spread of HPAI. Movement control, in the form of a permit system, allows otherwise uninvolved entities to make necessary movements to continue normal functions. Quarantine of domesticated

birds and other susceptible livestock, potentially contaminated products and conveyances, etc., prevents the dissemination of HPAI and increases the speed and likelihood of successful eradication. Implementation of quarantines and the administration of a permit system for movement control should be described in each State's animal health emergency response plan.

USDA will impose a Federal quarantine and restrict interstate commerce from the infected State(s) and request the infected and adjoining States (or country if State borders are also international borders with Canada or Mexico) to provide resources to enforce the quarantine. Reimbursement formulas for this activity will be set out in a cooperative agreement between the States and USDA. The Federal quarantine will be maintained until the disease is either eradicated or until an effective control area smaller than a whole State is implemented. Federal quarantines may be smaller than the whole State are usually implemented in conjunction with complementary State quarantines.

Making Premises Designations

The Incident Commander will work with the Planning and Operations Sections and the Epidemiology unit in determining appropriate premises designations. A premises will be evaluated according to the presence of a suspect, presumptive, or confirmed case (see case classification in Surveillance Definitions section above) of HPAI in a bird or other animal. In addition, other factors will be considered in premises designations including:

- Recent history of a premises related to pathogen transmission. Information from movement control records and other records.
- Observations and notes from a Foreign Animal Disease Diagnostician (FADD) or other animal health professional concerning diagnostic visits.
- Results of laboratory analysis of all samples taken on a premises.

Classification of Premises

In general, there are five types of premises in any animal disease outbreak: (1) infected premises; (2) contact premises; (3) suspect premises; (4) at-risk premises; and (5) free premises. If strategic vaccination is used, there will be a sixth type of premises—vaccinated premises.

Infected premises – An infected premises is a premises on which HPAI is presumed or confirmed to exist based on laboratory results and compatible clinical signs. All presumed positive premises and confirmed positive premises are classified as infected premises. In addition, all other premises that meet the current case definition are classified as infected premises. A premises quarantine is imposed, and all domesticated birds and other susceptible livestock are euthanized and disposed of properly.

Contact premises – A contact premises is a premises with birds or other susceptible livestock or products that have been exposed directly or indirectly to domesticated birds and other susceptible livestock, products, materials, people, or aerosol from an infected premises (the specific exposure factors to be considered must be appropriate to the epidemiology of HPAI). The contact premises will be quarantined and will be subjected to disease control measures that may include euthanasia and disposal of birds or other susceptible livestock. If the domesticated birds and other susceptible livestock on a contact premises are not euthanized, they will be placed

under surveillance for at least 42 days. Surveillance of contact premises will consist of a minimum of three inspections of birds or other susceptible livestock every 21 days, but inspections generally need not be more frequent than every other day. Inspections will continue until the infected zone or buffer surveillance zone, as applicable, is removed. If, due to extreme distance from all other infected premises and contact premises, a contact premises is not located within a control area, the premises will be treated as an “infected zone” and must be surrounded by a buffer surveillance zone.

Suspect premises – Suspect premises are those with birds or other susceptible livestock that are under investigation for a report of compatible clinical signs, but with no apparent epidemiological link to an infected premises or contact premises. A premises with birds or other susceptible livestock in the infected zone that is not classified as an infected premises or contact premises is initially also considered to be a suspect premises. These premises are under quarantine, movement restrictions (movement by permit only), and surveillance for at least 42 days. Surveillance will consist of a minimum of three inspections of domesticated birds and other susceptible livestock every 21 days, but inspections generally need not be more frequent than every other day. If a suspect premises is negative after 42 days of surveillance, no further regular surveillance will be required unless clinical signs are reported in the future. An additional inspection or inspections may be required on former suspect premises prior to removal of the infected zone. Rather than being subjected to quarantine and surveillance requirements, the owners of domesticated birds and other livestock on a suspect premises in an infected zone may elect to euthanize and dispose of their birds and other livestock, given approval by animal health officials managing the disease response.

At-risk premises – At-risk premises are those premises in a buffer surveillance zone that have birds or other susceptible livestock, but none showing signs of having a compatible clinical illness. Birds or other susceptible livestock from an at-risk premises within a buffer surveillance zone may be allowed to move within the buffer surveillance zone with a permit and application of appropriate biosecurity measures, but not out of the buffer surveillance zone. Nonsusceptible livestock from an at-risk premises can move within and out of a buffer surveillance zone with a permit and application of appropriate biosecurity measures as determined by risk assessment.

Free premises – Free premises are those in the free zone, outside a surveillance zone.

Vaccinated premises – Vaccinated premises are premises, within a buffer vaccination zone, on which vaccination is being, or has been, practiced.

Making Control Area and Zone Designations

The designation of one or more control areas and various zones is essential to successful quarantine and movement control activities. Appropriate zone designation and size will be determined through application of standard epidemiological methods and using surveillance data gathered throughout the outbreak.

Control area – A control area, consisting of an infected zone and a buffer surveillance zone, will be established to ensure the rapid and effective containment of the disease. Initially, the

entire State, Commonwealth, Tribal Nation, or territory may be declared a control area and subject to movement restrictions until appropriate surveillance and epidemiological evidence has been evaluated and the extent of the outbreak is known. All susceptible bird and other livestock movement will be stopped for a period long enough to determine the scope of the disease outbreak. The potential modes of transmission of HPAI will be considered when determining the minimum size and shape of a control area. Movement control through the use of permits should be maintained until the disease is eradicated.

Infected zone – In an outbreak of HPAI, the infected zone initially will encompass the perimeter of all presumptive or confirmed positive premises and include as many of the contact premises as the situation requires logistically or scientifically. The boundary of the infected zone initially should be at least 2 miles (3 kilometers) beyond the perimeters of the presumptive or confirmed infected premises. The boundaries may be modified (either expanded or reduced) as new information becomes available. The actual distance in any one direction is determined by factors such as known characteristics of the virus, environmental conditions (terrain, weather, wind), the pattern of animal density and movements, the distribution and movements of susceptible wild and feral livestock, processing activities (livestock and products), and the effect on nonrisk commodities. Boundaries of the infected zone can be modified when tracing and surveillance results become available and other listed factors become better defined. (For additional details, see the NAHEMS “Quarantine and Movement Control” guidelines.)

Domesticated birds and other susceptible livestock from outside an infected zone should not move into or through an infected zone unless they are going directly to slaughter and the nearest facility is inside the infected zone. Poultry and other livestock conveyances should be rerouted prior to reaching the infected zone. Quarantine and movement controls will be imposed on any product from an infected or exposed susceptible bird or other animal to ensure proper disposal.

Activities in an infected zone include:

- Conducting epidemiological investigations.
 - Identifying trace-ins and trace-outs.
 - Determining source(s) of infection.
 - Enforcing movement restrictions.
- Preventing domesticated birds and other susceptible livestock from leaving the infected zone except if going directly to slaughter in an approved slaughter establishment located in the buffer surveillance zone and meeting conditions described on a permit to move.
- Preventing products from birds and other susceptible livestock from leaving the zone unless risk assessment determines that such movement can be permitted.
- Preventing movement of vehicles, equipment, and nonsusceptible livestock out of the zone unless appropriate biosecurity procedures (as determined by risk assessment) are followed.
- Conducting a public awareness campaign to increase compliance with movement restrictions.

Buffer surveillance zone – The zone immediately surrounding the infected zone is the buffer surveillance zone. The buffer surveillance zone and the infected zone comprise the control area. The zone initially may include the entire State or States that have infected premises or known

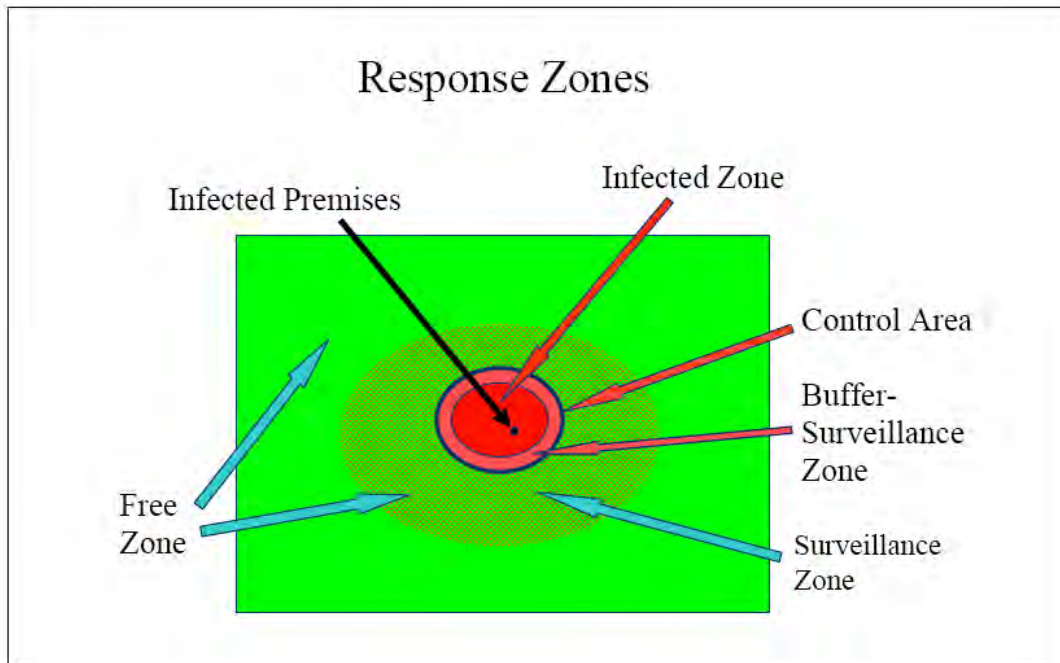
contact premises, until the scope of the disease outbreak is determined. In addition, any contact premises located outside an infected zone should be surrounded by a buffer surveillance zone. The buffer surveillance zone can be reduced in size as more epidemiological information becomes available. There is no minimum size prescribed for a buffer surveillance zone. (For further details concerning the buffer surveillance zone, see the NAHEMS “Quarantine and Movement Control” guidelines.)

Premises within the buffer surveillance zone that have clinically normal domesticated birds and other susceptible livestock are known as at-risk premises. Surveillance on these at-risk premises will consist of a minimum of two inspections of birds and other susceptible livestock every 21 days.

Buffer vaccination zone – If strategic vaccination is used, a buffer vaccination zone will surround the infected zone and be immediately inside the buffer surveillance zone.

Surveillance zone – A surveillance zone should be established within, and along the border of, the free zone, separating the remainder of the free zone from the buffer surveillance zone of the control area. Surveillance within the surveillance zone will focus on premises determined to be at the highest risk of infection. The suggested minimum size of the surveillance zone is 6.2 miles (10 kilometers). Activities in the surveillance zone include conducting case finding activities (surveillance) and conducting a public awareness campaign to increase compliance.

Free zone – A free zone is a zone in which the absence of HPAI has been demonstrated by meeting requirements for disease-free (or “free”) status as specified in the OIE International Animal Health Code. Within a free zone, and at its borders, appropriate official veterinary controls are applied for domesticated birds and other susceptible livestock, their products, as well as for their transportation.



2. Imposing Quarantine

All premises identified as infected premises and contact premises will be quarantined. All premises adjacent to infected premises or contact premises will be quarantined. The quarantine should specify to “hold” and “segregate” all susceptible species when possible. Quarantine area size and shape will be determined by the following factors: susceptible bird or other animal population densities; traffic patterns; human demographics; weather conditions that may affect transmission; epidemiology, history and other characteristics of the outbreak; commercial and industry considerations; topography; and natural geographical borders.

Initially, quarantined premises and bird or other animal movement restrictions may be established by the State authority. In the event of an outbreak of HPAI, Federal regulatory officials have the authority to place quarantines or “hold orders” under the AHPA. According to the AHPA, the Federal Government can cooperate with the States as appropriate to identify domesticated birds and other livestock infected with or exposed to HPAI; seize, quarantine, and depopulate such birds and other livestock and dispose of contaminated items; control intrastate movement; and otherwise carry out provisions of the law. States and Tribal Nations use their authority to carry out operations or implement measures within their jurisdictions.

Federal and State authorities may require special types of poultry operations, to include nonconfinement reared poultry, to increase biosecurity measures, such as temporary indoor housing, due to risk of disease exposure. These measures are described in USDA, APHIS, Further Guidance on Biosecurity and Disease Prevention and Control for Non-confinement Poultry Production Operations (on the Web at

http://www.aphis.usda.gov/newsroom/hot_issues/avian_influenza/contents/printable_version/non-confinement_poultry-ai_guidance4-18-06.pdf).

3. Releasing Quarantine

Planning for Release of Quarantine

Before issuing a quarantine, officials should have a plan for its release. The plan should specify the time that a complete restriction on bird, other livestock, or product movement will be in effect, the procedures by which the quarantined premises will be evaluated for the presence of HPAI, and whether the quarantine will be released by sections, according to evaluations of perceived risk, or entirely within the control area as described in “Controlled Movement of Birds, Other Livestock, and Their Products.”

Procedures for Releasing Federal Quarantines

For an infected premises to be eligible for release, all infected premises and contact premises within a defined portion of the control area also must be eligible for release. Cleaning and disinfection must have been effective in eliminating the HPAI virus and the premises must have been empty for a period appropriate to the poultry or animal industry sector involved. If cleaning and disinfection are considered inadequate, an epidemiologist will evaluate the premises to determine if further action is required.

Demonstrating Freedom from Disease: Any defined portion (area) of the control area that has met the standards for surveillance on both noncommercial and commercial premises will be eligible for release from Federal quarantine. This eligibility would occur after the last depopulation of an infected premises within that defined portion and following either a time period equal to 42 days, or until environmental sampling demonstrates HPAI virus negative test results after completion of cleaning and disinfection. Any portion of the control area intended for release from Federal quarantine must have an epidemiologically appropriate boundary to define the area. Environmental sample collection will be performed to validate that cleaning and disinfection processes have been effective in removing the HPAI virus from that premises and control area.

Releasing Quarantine on an Infected Premises

All areas of an infected premises must be evaluated and certified as clean before quarantine can be released. If Federal or State quarantines are in effect, various administrative processes for removing quarantines on premises will need to be completed. Incident responders should complete a variety of premises activities including:

- Management of domesticated birds and other susceptible livestock on the premises;
- Disposal of products and other contaminated or potentially contaminated materials.
- Management of wildlife;
- Cleaning and disinfection of the premises, with an adequate subsequent period of “downtime” allowed;

- Placement and evaluation of sentinel birds and other livestock (industry specific protocols will need to be developed); and
- Notification of other agencies, States, slaughter plants, and the public.

Release of Quarantine on a Contact or Suspect Premises

Before quarantine on a contact or suspect premises can be released, domesticated birds and other susceptible livestock and their products that have left the premises must be traced and evaluated.

Coordination with Other Areas or States

Depending on the size of the outbreak, coordination of quarantine placement and release between areas, States, or regions may be necessary for effective HPAI control and eradication.

4. Controlled Movement of Birds, Other Livestock, and Their Products

Permits for Movement

Following an established regulation or policy memo, Federal and State authorities can issue an official permit for movement of domesticated birds and other susceptible livestock and their products to allow their movement from a premises or a geographic area described in a quarantine order. A request for a movement permit must be supported by a risk assessment.

Permits for Movement within a Control Area

Permits to move domesticated birds and other livestock and materials from premises to premises within a control area can be issued if:

- No birds or other livestock on that premises have shown clinical signs of HPAI for 42 days and disease free status has been verified within 24 hours prior to movement;
- No susceptible species were added to the premises of origin for 42 days;
- The premises of origin is not an infected premises, contact premises, or suspect premises, and there is no detectable evidence of HPAI (see Appendix C);
- Transport conveyances for the birds and other livestock and product meet acceptable biosecurity standards.

Movement to Slaughter Within a Control Area

Permits to move to slaughter (for human food use) or processing (e.g., eggs and egg products) can be issued if (a) the birds and other livestock or products meet the requirements of USDA's Food Safety and Inspection Service for food use; and (b) the birds and other livestock or products are eligible for a permit for movement from premises to premises or for movement directly to slaughter.

Movement Out of an Infected Zone

No susceptible birds or livestock species or products posing a risk of AI transmission may leave the infected zone unless they are (a) going directly to slaughter at an approved slaughter facility established in the buffer surveillance zone; (b) going directly to a processing facility in the buffer

surveillance zone; and/or (c) meet criteria described on a permit. No materials posing risk of AI transmission may leave the infected zone except by permit.

Movement Within an Infected Zone

During the initial phase of an incident, no shipments of domesticated birds or other livestock, products, or materials posing a risk of AI transmission should be allowed to move within an infected zone except at the discretion of the Incident Command.

Movement Within the Buffer Surveillance Zone

Susceptible animal species or products posing a risk of AI transmission may be moved within the buffer surveillance zone under permit if they are not known to be infected with or exposed to HPAI and birds show no signs of other communicable diseases.

Movement Out of the Buffer Surveillance Zone

Susceptible animal species or products posing a risk of AI transmission may be allowed to leave the control area if a risk assessment deems such movement to be appropriate. Movement will require a permit as prescribed by the HPAI Incident Commander.

Movement of Nonsusceptible Livestock

Movement of nonsusceptible livestock out of the control area requires a permit as prescribed by HPAI Incident Command.

E. Epidemiological Investigation and Outbreak Response

Every effort must be made to educate producers about the clinical signs of HPAI and to encourage them to report signs of disease to the State Veterinarian or other appropriate authority. A case definition should include clinical signs that a private practitioner or person in daily contact with poultry and other bird species might see. Information should be provided in State, local, Tribal, and industry HPAI plans on how to recognize and report these findings. Epidemiological techniques will be used to:

- Understand the characteristics of the disease (e.g., clinical signs, incubation period, populations affected) and outbreak characteristics (e.g., sources, disease incidence patterns, geographic distribution) as they affect specific populations;
- Identify risk factors associated with the disease occurrence (e.g., age, production practices, species, and wildlife);
- Provide information for decisions on the design and implementation of control measures (e.g., zone designation, zone size, and tracing) in response to HPAI; and
- Evaluate the effectiveness of the control measures implemented and adjust them as the situation dictates.

A team of Federal and State advisors will be deployed to the incident site to evaluate the situation and provide an epidemiological assessment to the Deputy Administrator of VS within 24 hours of arrival. Team responsibilities are detailed in Section II. I – Vaccination.

Epidemiologists functioning at the national level will establish the case definitions within 24

hours of the first presumptive or confirmed positive case (index case). The case definition will need to be modified on an ongoing basis based on additional information or changing needs of the eradication effort.

Within 96 hours of identifying the index case, the nature of the outbreak will be characterized, risk factors will be identified, and mitigation strategies will be developed. These measures will aid in the control of spread of HPAI to lessen the impact during the outbreak response.

Premises classification and a priority of investigation will be assigned within 6 hours of identifying a potential infected premises or contact premises through tracing activities. The VS Emergency Management Reporting System or other appropriate system will be used to collect and report epidemiological data, as well as premises status data, locally and nationally.

Tracing

Urgent, meticulous, diligent, and complete trace-back and trace-forward of all contacts with infected birds, other livestock, and premises will be vital to effectively contain HPAI. Tracing should include all movements from the premises including birds and other susceptible livestock and their products, vehicles, feed, and people.

Tracing should also include consideration of potential modes of transmission and possible contact with wildlife. Trace-back information should be collected for at least two maximum incubation periods (42 days) before the onset of clinical signs of infected birds and other livestock. Trace-forward information should be collected up to the time that quarantine is imposed. It is highly likely that the first bird, animal, or premises identified with disease (the index case or premises) will not be the first bird, animal, or premises that had infection or disease within the country or the area.

All efforts should be expended to determine the true index premises. The goal is to identify all additional contact premises within 24 hours of identifying the infected premises or the initial contact premises.

Tracing Movements From Affected or Exposed Slaughter Facilities

Tracing fresh, frozen, or chilled products from a slaughter facility can be difficult. The FSIS or State veterinary inspector and the plant manager should be contacted initially to determine appropriate product movements to be traced in coordination with the corresponding industry representatives.

USDA has worked with industry to ensure food safety. If highly pathogenic AI is diagnosed in a commercial flock, USDA is able to test poultry meat for the presence of the HPAI virus from flocks slaughtered and processed during the 24 hours prior to the sentinel event and originating from within the infected zone.

The Food Safety and Inspection Service, in coordination with the Agricultural Research Service, developed a laboratory test capable of detecting the H5N1 strain of HPAI in poultry meat.

Industry will hold product until the test results are received. The test results may also enhance USDA's surveillance capabilities and update existing epidemiological data during an outbreak.

Tracing Movements From Live Bird Markets, Wholesalers, Distributors, and Auction Markets

If HPAI is diagnosed in the LBMS, the appropriate epidemiological investigation and tracing will be coordinated with the State(s) so that the source distributor(s) and flock(s) can be located. Once the source distributor(s) and flock(s) are located, quarantine and movement controls will occur according to previously stated recommendations above (see section on Quarantine and Movement Control). The procedures for tracing birds, vehicles, and personnel from infected, contact, or suspect markets are essentially the same as those for individual premises.

Recalling Products From Trade Destinations

In situations in which infected, contact, or suspect birds and other livestock or contaminated items have already left U.S. ports for a trade destination, the veterinary officials of the destination country should be informed immediately of the situation and offered the option of discontinuing the transaction and following applicable import and export regulatory procedures for disposition of live livestock and animal products.

Surveillance

Surveillance during an HPAI outbreak will be coordinated to optimize the available resources. USDA, APHIS, will coordinate national surveillance activities from national or regional operational centers. The joint command at the State Emergency Operations Center will manage local coordination. Operationally, the epidemiology, tracing, and surveillance teams will work together to accomplish the expected outcomes.

HPAI surveillance will be implemented within 48 hours of the identification of the index case. Goals of HPAI surveillance are to define the extent of the outbreak, including disease-free zones, and quickly detect new cases to facilitate implementation of rapid control and eradication measures. USDA, APHIS, Wildlife Services, will coordinate with the DOI and State wildlife agencies to perform enhanced AI surveillance in the wildlife population of the area.

As soon as practical, surveillance of suspect premises will include laboratory testing of susceptible species. Suspect premises without reported clinical illness should be inspected at least three times in a 21-day period. Surveillance on an at-risk premises will consist of a minimum of two inspections of susceptible species in a 21-day period. Surveillance within the buffer surveillance zone will also include slaughter surveillance, serological surveys, and investigation of reports of suspect disease. It will include poultry facilities, nonpoultry birds, other susceptible livestock, and wildlife populations if present. The level and direction of surveillance will be driven by the epidemiological information being collected.

Surveillance outside the control area will be accomplished by slaughter surveillance, serological surveys, and investigation of reports of suspect disease. Local veterinary practitioners should be informed to the fullest extent possible and encouraged to provide their insight for surveillance activities outside the control area.

Stamping-Out

Within 24 hours of a premises being classified as an infected premises, the infected and susceptible livestock will be humanely euthanized or depopulated. In many cases, birds and other susceptible livestock on a contact premises must also be depopulated within 24 hours.

A stamping-out policy is the strategy that will be implemented on all infected premises and most, if not all, contact premises. If resources are limited, premises will be prioritized so that those with high potential for active spread of HPAI are acted upon before those that do not have a high potential for active spread.

Based on the epidemiology of the outbreak, it may be necessary to prioritize the species depopulated/euthanized first, if multiple species are involved. Birds and other livestock considered most likely to produce or shed HPAI viruses will be given priority for depopulation and disposal. Those with clinical signs will be removed first to reduce virus excretion.

Public concerns raised by a stamping-out policy will require a well planned and proactive public relations and liaison campaign involving all stakeholders, the public, and the international community.

F. Mass Depopulation and Euthanasia

Mass depopulation is practiced during an HPAI outbreak to prevent or mitigate the spread of the disease through elimination of infected or exposed domesticated birds and other susceptible livestock. Qualified personnel perform depopulation procedures in the quickest, safest, and most humane way possible, considering a variety of methods used with success by Federal, State, and industry personnel. Mass depopulation of domesticated birds and other susceptible livestock must be performed using agents and methods determined to be acceptable by the American Veterinary Medical Association's Panel on Euthanasia.

In addition APHIS has conditionally approved water-based foam as a method of mass depopulation of poultry. If approved for depopulation, this method could be used for floor-reared poultry in accordance with USDA APHIS "Performance Standards for the Use of Water-Based Foam as a Method of Mass Depopulation of Domestic Poultry" under any of the following conditions:

- Animals infected with a potentially zoonotic disease, or
- Animals infected with a rapidly spreading infectious disease that, in the opinion of State or Federal regulatory officials, cannot be contained by conventional or currently acceptable means of mass depopulation, or
- Animals housed in structurally unsound buildings which are hazardous for human entry (such as those damaged during a natural disaster).

The goals of mass depopulation are to provide humane treatment of domesticated birds and other livestock at all times, especially from the time they are identified for destruction until they are euthanized; provide aesthetically acceptable euthanasia to the affected species as quickly,

efficiently, and humanely as possible; and minimize, to the extent possible, the emotional and psychological impact on animal owners and caretakers, and their families. Consideration must be given to the owners and caretakers, and their families, during this process. All should be provided with a complete explanation of what to expect. Psychological supportive services for the affected families will be offered.

Depopulating domesticated birds in cages will be avoided whenever possible since it can be extremely difficult to remove dead birds from cages once rigor mortis is established. It is usually better to remove live birds from their cages and to depopulate them by an accepted method before disposal.

G. Disposal

Effective disposal of infectious or contaminated materials (e.g., fresh and frozen carcasses, dead domesticated birds, eggs, litter, manure, waste products, fittings, and building materials that cannot be effectively decontaminated) is a key component of the HPAI response. (See Appendix D for Options for Disposal of HPAI H5N1 Affected Avian Carcasses.) The goal of disposal is elimination of these materials in a timely, safe, biosecure, aesthetically acceptable, and environmentally responsible manner. Disposal decisions should be made on a case-by-case basis depending on the individual premises circumstances, evaluation of disposal sites, and optimal disposal procedures. It is recommended that State and industry plans include site specific disposal methods for premises within their jurisdiction. Consultation with local, county, State, and Federal environmental officials should be a part of disposal planning.

Specific disposal methods, including composting, burial (onsite or landfill), incineration, digestion, and rendering, should be assessed and applied as appropriate for the premises or facility location, the type and design of housing to include manure pits in layer houses, domesticated birds and other animal species, product, or contaminated material for disposal. For poultry, in-house composting is usually the preferred method of initial decontamination and helps prevent dispersal of the virus. However, composting may be accomplished on the premises either in the house, in silage bags, on adjacent land, or at an approved central location. During composting, an appropriate AI testing protocol should be incorporated into the process to ensure no viable virus is detectable prior to movement of composted materials.

Onsite burial is an inexpensive and biosecure method of disposal and minimizes the transportation of infected materials. Offsite burial may be needed when onsite burial is not possible or when a number of infected premises must be depopulated and decontaminated in a given area and where a common burial site would be more efficient. Municipal solid waste landfills that accept mortality may also be used.

Incineration is an effective means of safe disposal of infected materials, but may not be practical due to expense and availability of incinerators large enough. Rendering is a good means of disposal if the plant has the capacity needed and if it is possible to safely and effectively decontaminate the rendering plant afterward. However, movement of contaminated materials offsite may not be acceptable.

If infected material must be transported off the premises for disposal, State and/or Federal authorities must first authorize this movement (see Quarantine and Movement section above). Appropriate biosecurity measures, such as special routing, disinfection and leak-proof transportation methods, will be followed to prevent viral spread. The transport vehicle(s) will be accompanied by government representatives, and escort vehicles may be required. Disinfectant (see Appendix A), liquid-absorbing material, and other tools or equipment needed to clean up spills occurring en route should be carried out by the appropriate government authority.

H. Cleaning and Disinfection

To minimize the risk of contaminated vehicles, equipment, and personnel leaving the premises, cleaning and disinfection of premises should begin as soon as possible after the disposal of infected domesticated birds, other susceptible livestock, and their products. This is essential in order to contain the spread of HPAI virus and is an integral part of the eradication plan. Care must be taken to reduce the generation and dispersal of infectious dust and aerosols. If items cannot be adequately cleaned and disinfected, they should be disposed of by burial, incineration, or other appropriate means. The surface of roads and yards adjacent to and within the infected premises should also be sprayed with an appropriate and environmentally approved disinfectant (see Appendix A).

Cleaning is one of the most important and cost effective steps in the cleaning and disinfection process. The presence of inorganic materials (e.g., soil) may physically prevent the disinfectant from reaching all contaminated surfaces, and the presence of organic materials (e.g., manure and respiratory secretions) may physically prevent the disinfectant from reaching all contaminated surfaces and also inactivate the active ingredients of the disinfectant.

Premises Cleaning and Disinfection

Houses/Buildings

- Disposal should include removal and disposal of any live or dead domesticated birds and other livestock, litter, or composted material from the building according to predetermined HPAI control and eradication plans.
- Free-flying wild birds in the house should be removed, and entrance areas for wild birds should be closed.
- An insect control plan should be in place to effectively reduce fly and beetle movement to adjacent premises while the house is being cleaned. This may include a combination of insecticides and methods such as sprays, foggers, and baits. Rodent control efforts need to be increased and effective as the organic material is removed from the house to prevent rodent migration to adjacent farms and return to the cleaned house. This may be in the form of bait stations, trapping, or other methods as deemed appropriate.
- AI viruses can be spread to susceptible species either directly or indirectly via fomites (i.e., mechanical carrier contaminated with viable virus). The direct route of spread will have been eliminated by disposal of the susceptible bird or other animal population. It is imperative that all potential fomites be cleaned and disinfected prior to movement.

Equipment Handling

- Water Systems – All components of the watering system should be flushed, sanitized, and drained. Bell drinkers should be removed and disassembled for removal of organic debris to permit proper cleaning and disinfection. Reservoirs should be flushed, sanitized, and drained during the house cleaning procedures.
- Feeding Systems – Feed remaining in the pans, feed lines, chains, augers, or hoppers should be removed and placed on the floor for removal with the litter. These lines and equipment will be removed or raised prior to removal of litter.
- Ventilation – Fans, casings, motors, belts, curtains, ventilation pads, and louvers should be individually cleaned and free of manure, debris, dust, and feathers prior to disinfection. Equipment such as thermostats, scales, time clocks, electrical panels, switches, and light bulbs may need to be individually wiped, cleaned, sanitized, and protected from the more severe methods of cleaning such as high pressure sprayers and disinfectant chemicals and protected from recontamination during the cleaning process.
- Slats – Slats should be scraped of adhering caked manure and debris before removal from the house, followed by high pressure washing and disinfection.
- Nest box material – Nest box material such as shavings or sawdust should be removed from the nest boxes and placed on the floor and removed with the litter. Reusable nest pads should be removed, washed, and sanitized outside of the house.
- Egg belt, egg flats, egg buggies, and packing machines – Adherent yolk, egg material, and shell debris should be removed prior to cleaning and disinfection.
- Egg room, storage areas – Mechanical equipment, supply rooms, egg rooms, and storage areas should be cleaned of materials, debris, equipment, and supplies for proper removal of organic materials and disinfection.
- Floor areas litter and manure – All removable and obstructive equipment such as feeders and watering systems need to be raised or removed prior to entry of back hoes, bobcats, and other house cleaning equipment into the house. All litter, manure, and organic debris should be removed from the house and disposed of by previously approved handling procedures for this material. Approved methods may include composting (shed or under plastic) or burial. Equipment used to clean houses will be cleaned and disinfected prior to leaving the premises.
- Dry cleaning – Once litter and manure material are removed from the house and disposed of, air blowers or vacuums should be used to remove dust, cobwebs, and other material on ceilings, rafters, and other areas. Floor areas should be blown down and brooms cleaned prior to the wash down step.
- Washing – Houses should be washed down with high pressure water with detergent to remove remaining dust and organic debris. Curtains should be exposed to permit correct cleaning and removal of adherent feathers, dust, and organic material.
- Exterior of house – A perimeter of 10 feet around the exterior of the house free of uncut grass, feathers, litter, materials, and obstructions is necessary. Rodent holes should be sealed at this time. Roof areas and eaves with holes or nesting areas for wild birds should be addressed at this time. Drop ceiling houses should also be examined for rodents in the attics and crawl spaces and baited accordingly.
- House disinfection – After the washing step, the house should be permitted to dry out prior to spraying all surfaces in the house with an appropriate disinfectant. Main doors should be closed or screened to prevent reentry of wild birds or other domesticated birds and livestock.

Premises should remain empty and test virus negative before repopulation in accordance with State response plans.

I. Vaccination

In the event of an HPAI outbreak, USDA, APHIS, will respond by implementing sanitary measures and a stamping-out policy that involves the culling of domesticated birds and other livestock infected or suspected of being infected. However, under certain conditions, as an adjunct or complementary strategy to control the disease spread, USDA, APHIS, would consider a vaccination approach. This section describes USDA, APHIS, policies on when to vaccinate, what species will be vaccinated, active surveillance, and exit strategies. For additional information on vaccination, see the NAHEMS guidelines on “Vaccination for Contagious Disease.”

Safety and Health of Vaccination Personnel

HPAI response activities that involve poultry must be implemented in a way that protects workers from exposure to HPAI viruses and therefore reduces the likelihood of infection, illness, or viral reassortment. Appropriate use of personal protective equipment (PPE) and seasonal influenza vaccinations are recommended for all personnel working during an HPAI outbreak (see Appendix E).

When To Vaccinate

AI vaccines may be prepared from any serotype, including H5 and H7, and may be recommended for use in domestic chickens and turkeys subject to the requirements and restrictions specified in VS Memorandum No. 800.85 on Avian Influenza Vaccines. This memorandum allows H5 and H7 vaccines to be used only under the supervision or control of USDA, APHIS, VS, as part of an official USDA animal disease control program. All other subtypes are under the authority of the State Veterinarian. USDA, APHIS, CVB implements the provisions of the Virus-Serum-Toxin Act to ensure that veterinary biologics used for the diagnosis, prevention, and treatment of animal diseases are pure, safe, potent, and effective.

A team, comprised of Federal and State advisors, will be deployed to the incident site to evaluate the scope of disease and assess resource needs. The team will report results of the assessment to the Deputy Administrator of VS (who also is the Chief Veterinary Officer for the United States) within 24 hours of arrival. Time permitting, the Deputy Administrator will consult with other Federal agencies, industry, experts from universities, and other sources and will consider any input received when deciding whether to vaccinate. This decision-making process ensures that the decision will be transparent, scientifically based, and appropriate.

The team will base its epidemiological assessment on the following elements and considerations:

- 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 domestic wild 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;
- Short-term impact on export markets; and
- Economic consequences of failure to control the disease.

Once a decision has been made to vaccinate, it will be implemented strategically in order to create a “firebreak” ahead of the spread of the HPAI virus.

Activation of the USDA AI Vaccine Bank

Using the team recommendation and the HPAI vaccination decision tree matrix, the Deputy Administrator will determine if vaccination will be implemented. (See Appendix F for the Decision Tree Matrix). Once the decision to use vaccine is made and the appropriate vaccination strategy is approved, vaccine will be ordered from the USDA vaccine bank. The specified number and type of vaccine doses and other vaccination supplies will be prepared and shipped from storage to the locations requested by the Incident Commander.

Vaccination Administration

NAHEMS guidelines on vaccination define procedures to prevent the spread of the highly contagious disease agents by the vaccination teams. NAHEMS also describes methods to measure the effectiveness of the plan, logistical needs, and options for the disposition of vaccinates, and identification of possible adverse reactions in birds vaccinated.

If vaccine is used, a vaccination plan will be developed by the Planning and Operations Sections of the Incident Command Post (ICP) within 7 days after the decision to vaccinate. The plan will define protocols to prevent the spread of HPAI by the vaccination teams and describe the implementation process. Key aspects of the plan will include the following responsibilities of vaccination unit personnel: assemble and equip a vaccination team or use industry vaccination crews; organize and staff a vaccination center; order, store, and use vaccine; follow effective on-premises vaccination procedures to include biosecurity; and keep accurate and complete vaccination records. It will also describe ways to measure the effectiveness of the plan, options for the disposition of vaccinates, and how to identify adverse reactions in birds vaccinated. These vaccination protocols will be under the direction of personnel located at the ICP.

Vaccination programs also involve constraints and risks, including the cost of vaccine, routes of administration, the need for booster doses of inactivated vaccine, the time required to achieve immunity, the need for surveillance to monitor vaccinated birds and sentinels, potential for viral spread by vaccination teams, the need to maintain high biosecurity, and export consequences.

Other areas of consideration for vaccine use are major poultry producing areas, high poultry population density (where virus movement will be difficult to control with biosecurity alone), farms located at the perimeter of the infected zone, starting at the outer edge of the selected area and working toward the index cases, and isolated poultry producing areas where vaccination could control spread.

Vaccination strategies will differ depending on the class of commercial bird and its domestication status. The following are the bird classes in order of vaccination priority:

- Valuable genetic poultry, breeding stock such as grandparent and parent breeders
- Long-lived poultry, such as layers
- High-risk situations, such as ring vaccination around HPAI infected birds
- Rare, endangered, genetically valuable captive birds (zoos, avicultural collections, etc.)
- Backyard birds
- Commercial ducks
- Broilers, meat production poultry, turkeys

Vaccination will be applied within a buffer vaccination zone. The buffer vaccination zone will surround the infected zone and be immediately inside the buffer surveillance zone.

Surveillance of Vaccinated Flocks

Prompt early detection of HPAI infection to ensure compliance with international standards is only possible by implementing appropriate surveillance programs. When vaccine is used, surveillance will be continued to detect any antigenic change of circulating virus. Unvaccinated, identified sentinel birds may be placed in the flocks and monitored to assess the vaccination effectiveness. Rare, endangered, and genetically valuable captive birds, such as those in zoos and avicultural collections, should be identified if vaccinated. This intensive surveillance program will be aimed at virus or antibody detection via testing of sentinel birds in vaccinated flocks and will aid in the control of HPAI outbreaks.

The use of appropriate diagnostic tests, sentinel birds, and vaccines allows the use of the “differentiation of infected from vaccinated animal” (DIVA) strategy. The DIVA strategy can be based on:

1. Serological and viral detection of AI infection in unvaccinated sentinels placed within the vaccinated flock;
2. Viral detection in vaccinated or nonvaccinated nondomestic avian species by RRT-PCR;
3. Use of a licensed recombinant vaccine containing only the AI hemagglutinin gene such as the licensed Fowl Pox Virus Vaccine with AI H5 hemagglutinin gene, and detection of infection by the presence of antibodies to nucleoprotein or matrix protein; and
4. The use of an inactivated oil emulsion heterologous vaccine containing the same H subtype as the field virus but a different N subtype.

Exit Strategy Following Vaccination

It is recommended that AI vaccination cease as soon as possible to allow the region or State to quickly return to a favorable trade status. Noninfected vaccinated domesticated birds should be eliminated as soon as possible through both euthanasia and disposal or controlled slaughter. Noninfected, vaccinated breeding stock, high-value birds, and zoo or collector birds should remain in a closed environment where the HPAI infected status of these birds can be monitored through a validated DIVA strategy, by serological or PCR monitoring of sentinel birds maintained in the same environment, or by dead bird surveillance of other birds in the same environment.

Safeguarding Trade

The use of a vaccine to help control an HPAI outbreak does not imply automatic loss of export markets. To safeguard international trade, a communication strategy will be implemented to provide specific information to the OIE and U.S. trade partners that identifies the infected and surveillance zones, ability to compartmentalize, and clearly defines actions to be taken during the emergency response. The OIE Terrestrial Code Chapter on AI allows for trade to continue from compartments and zones demonstrated free of AI. Active surveillance, including strategic location of sentinel unvaccinated birds, will be strictly applied within the vaccination zone. Efforts will be made to ensure U.S. trade partners and the OIE that no live birds or products from the infected and vaccination zones will be allowed to move out of the quarantined areas. Strict recordkeeping on vaccine use will be mandatory.

J. Appraisal and Compensation

The Animal Health Protection Act (AHPA) provides authority to APHIS to establish and implement an indemnification program to prevent or eradicate an AI outbreak. Indemnity is a key component of APHIS' disease control programs in that the promise of fair compensation for losses helps to ensure the quick and full cooperation of the owners of affected livestock. Such cooperation is central to rapid disease control and eradication. In an HPAI outbreak, it may be necessary to order the destruction of birds on or epidemiologically linked to an infected premise – either commercial or backyard – to ensure that the disease does not spread. The Secretary has the authority to pay up to 100 percent of the fair market value of the birds and for disposal and cleaning and disinfection. But it must be made clear that compensation only will be paid in cases where State and Federal animal health authorities concur with recommendations to order the destruction of birds, whether those recommendations come from industry, State, or Federal authorities.

The best practices for containment and eradication of HPAI will in many instances require a speed of depopulation, disposal, and decontamination that is more rapid than can be achieved with a slow or deliberate appraisal processes. Appraisals will not be required to be signed prior to destruction if APHIS and the cooperating State Agency agree that the poultry must be destroyed immediately to mitigate the potential spread or potential amplification of HPAI virus during a response to a confirmed or presumptive HPAI incident. All data that are required to

determine fair market value will be collected prior to depopulation, including a complete inventory of birds being destroyed.

APHIS has recently published an interim final rule¹ to increase indemnity for H5/H7 low pathogenic avian influenza (LPAI) viruses, adding parts 56 and 146 to Title 9 of the *Code of Federal Regulations* (CFR). Section 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. Indemnity distribution between owners and growers will follow the formula set out in 9 CFR 56.8 or as set forth in any forthcoming changes or revisions to the interim final rule.

Appraisal Procedures

The immediate purpose of the appraisal process is to determine the fair market value of domesticated birds and other livestock and materials to be indemnified. The goal is to provide fair market value indemnity payment to owners and contract growers of domesticated birds, other livestock, and materials requiring destruction to prevent the spread of HPAI virus. Appraisal schedule valuations developed by APHIS from market and industry information will be used in most instances to calculate the fair market value for domesticated birds, other livestock, or materials requiring destruction. Additional appraisal methods may be offered in instances where domesticated birds and other livestock do not fit the averages on which valuations are based.

Preliminary Inventory

Once an FADD or designated official has determined that domesticated birds and other livestock and/or materials on a premises have been infected or contaminated by (or exposed to) HPAI virus, he or she performs a preliminary inventory of the domesticated birds and other livestock and materials and enters this information into the Emergency Management Response System or other acceptable database. In this capacity, the FADD serves as a liaison with the Appraisal Unit to identify the domesticated birds and other livestock and materials to be appraised.

The Appraisal Unit Leader should check with the animal owner to determine whether any high-value (i.e., unique, special, exotic, or purebred) domesticated birds and other livestock are present before sending an Appraisal Team to the premises. If domesticated birds and other livestock are present, the Appraisal Unit Leader should contact the Emergency Management Compensation Specialist to discuss the situation, including any special documentation required from the owner. The Appraisal Unit Leader should then inform the Appraisal Team how to handle the situation and if a special expert appraiser will be part of the Appraisal Team.

Coordinating Appraisal Activities

The Appraisal Unit Leader should determine the order in which domesticated birds and other livestock and materials will be appraised. In general, domesticated birds and other livestock

¹ <http://a257.g.akamaitech.net/7/257/2422/01jan20061800/edocket.access.gpo.gov/2006/pdf/06-8155.pdf>; Section 56.8, Conditions for payment.

should be appraised first, and materials including animal products and feed should be appraised last. The goal is to perform appraisal before depopulation, unless predetermined fair market compensation has been accepted.

Conducting an Appraisal

The appraisal process consists of a number of steps or tasks, each of which is essential to a successful appraisal and prompt owner compensation. Some key tasks are outlined below:

- Determine the correct name and address of the owner(s) of the domesticated birds and other livestock on the premises and record this information on VS Form 1–23.
- Make sure what is eligible for compensation before proceeding with the appraisal.

Allowable claims include:

- Domesticated birds and other livestock destroyed due to infection or exposure to HPAI virus.
- Materials destroyed due to contamination or exposure to HPAI virus.

USDA will **not** allow claims involving:

- A payee who has not complied with all quarantine requirements.
- Expenses for the care and feeding of domesticated birds and other livestock held for destruction.
- The destruction of domesticated birds and other livestock or materials unless these have been appraised as described in Part II, Section J, or the owner has signed the VS Form 1–23.
- The destruction of domesticated birds and other livestock or materials that have been moved or handled in violation of a law or regulation.

It should be noted that USDA/APHIS will not provide indemnity for other losses associated with extended periods of downtime due to disease situations. USDA and its State partners will work expeditiously to complete necessary disease control response actions so that, to the extent possible, downtime is minimized.

- Appraisal of the fair market value of domesticated birds and other livestock is estimated using fixed rate valuation, sales comparison approach, cost-of-production approach, or income approach. (See Appendix G for definitions of appraisal methods.) When appraising an animal, the Appraisal Team should consider the purpose for which the animal is being reared as well as its age, conformation, physical condition, and potential production.
- Appraisal of materials such as products from domesticated birds and other livestock (e.g., eggs), housing units, bedding, feed for domesticated birds and other livestock, farm equipment, clothing, articles stored in or adjacent to barns or other structures, and other items (e.g., board fences and wooden feed racks).
 - Materials to be appraised and destroyed will have been contaminated by or exposed to diseased domesticated birds and other livestock and will be incapable of being cleaned and disinfected adequately. Inputs, such as feed, and outputs, such as eggs, should be appraised using the sale comparison approach. Permanent assets, such as fences and barns, can be appraised using the cost-of-production approach with depreciation.
- Ensure that the owner or owner's representative(s) is aware of the Owner-Claimant Mortgage Certification on VS Form 1–23 concerning liens and mortgages. The Owner-Claimant Mortgage Certification is to be signed by the owner and by each person holding a mortgage on the domesticated birds and other livestock or materials.

- Obtain an accurate inventory of domesticated birds and other livestock and materials to be destroyed for which indemnity will be paid.
- Complete forms, catalogue any visual records, cross-check information and process for approval.

Appraisal Disputes

Disputes over appraisal and compensation will not delay the destruction of domesticated birds and other livestock and materials. USDA is authorized by the AHPA to seize domesticated birds and other livestock and materials to prevent the dissemination of the pest or disease, and the owner is required to follow the order of the Secretary. Owners and contract growers who wish to dispute the appraisal may appeal the evaluation. USDA will cooperate to promptly resolve any appraisal disputes.

Processing Indemnity Checks

Finance/Administration Section personnel will check the VS Form 1–23 and will then complete the “Indemnity Claim Transmittal” (VS Form 1–31). Under normal circumstances, after final approval, the package is forwarded to USDA, APHIS, Marketing and Regulatory Programs Business Services, for final processing.

Alternative Processing

During a major HPAI outbreak, alternative indemnity payment processes may be used to expedite owner compensation. Upon reporting to the Field Operations Center, the Appraisal Officer should contact the Finance/Administration Section Chief to determine locally arranged procedures for processing the VS Form 1–23.

K. Wildlife Management

Wildlife is defined for this document as all free-ranging native, feral, and exotic birds and other livestock in the United States. Wildlife may be involved in the maintenance and/or transmission of livestock and poultry diseases and may complicate demonstration of freedom from such diseases at the conclusion of an eradication program. USDA, APHIS, Wildlife Services, and the DOI will work in concert with State wildlife agencies to respond to HPAI events in wildlife. There is a paucity of information available for decision-making in regards to wildlife and HPAI, and development of epidemiological information regarding wildlife will be necessary during an HPAI outbreak. The goal of wildlife management is to prevent transmission of HPAI between domesticated birds and other susceptible livestock and wildlife.

Wildlife Management Objectives During an HPAI Outbreak in Domestic Poultry

- Assess the presence of susceptible wildlife in the affected areas.
- Assess the potential for spread of the AI virus to wildlife.
- Determine if wildlife surveillance is needed.

- Develop a protocol for wildlife surveillance.
- Determine if the infection has spread to wildlife.
- Determine if the AI virus is spreading via wildlife.

Where disease control within wildlife is necessary, additional objectives will apply:

- Minimize risk of dispersal of wildlife from infected premises.
- Implement measures to prevent mechanical spread of the HPAI virus via wildlife.
- Develop protocols for long-term surveillance.
- Develop information on the current role of wildlife in the epidemiology of HPAI.
- Develop information on the current impact of the disease on wildlife.
- Develop information on the impact of disease control and eradication measures on wildlife.
- Provide justification for wildlife surveillance and control measures.
- Assist the State wildlife agency and emergency response system in developing public support for Wildlife Section actions.
- Evaluate and recommend hunting season and public lands closings.

Personnel and Equipment

The Wildlife Section will include a Wildlife Coordinator, one or more Wildlife Officers, a State Wildlife Liaison Officer from each affected State, and field personnel.

The Wildlife Coordinator will be assigned and located at the USDA, APHIS, Emergency Operations Center, Riverdale, Maryland. The Wildlife Coordinator will be a wildlife health specialist with response training and experience.

Wildlife Officers will be wildlife health specialists with response training and experience. State Wildlife Liaison Officers are assigned by their respective State wildlife agency. Field personnel will be selected from State or Federal wildlife agencies or other sources at the discretion of the Wildlife Officer and State Wildlife Liaison Officer.

Wildlife surveillance requires persons trained and proficient in wildlife capture, collection, and restraint. Wildlife surveillance also requires that specialized experience in handling wildlife be combined with all other aspects of the response including specimen collection, handling, and biosecurity. All Wildlife Section activities will be conducted within Federal, State, and local laws under the direction and authority of the Incident Commander. Wildlife Section activities will be highly coordinated with other elements of the emergency response including diagnosis and investigation, disposal, cleaning and disinfection, and biosecurity and must be in compliance with all protocols.

Quarantines and Movement Control for Wildlife

The geographic area and migratory bird flyway(s) in the vicinity of an infected premises will be identified and assigned a status relative to quarantines and movement control. Wildlife Section

activities will be conducted in these same identified quarantine areas, and all policies and procedures relative to quarantine and movement control will apply to all Wildlife Section activities.

Wildlife Risk Assessment

An initial objective of the Wildlife Section is to determine if there is a risk for infection of wildlife. This risk will be dependent upon the wildlife species present, susceptibility of these species to the HPAI virus, and the level of exposure to infected domesticated birds and other livestock and the virus. It will be critical to assemble all available information regarding wildlife in the affected area, and it may be necessary to conduct surveys to determine the presence of wildlife. Wildlife surveillance will be implemented when there is a potential for spread of the HPAI virus to susceptible wildlife. Surveillance of other potential wildlife vectors, including mechanical vectors, may also be implemented, but will be secondary to surveillance of susceptible wildlife.

Wildlife Surveillance

The protocol for surveillance of wildlife for HPAI will be adapted to the prevailing circumstances in the affected area. Wildlife surveillance will include active and passive methods deemed appropriate by the Wildlife Section leaders and approved by the State agency with authority over wildlife. Active surveillance methods may include collection of susceptible wildlife, carcass searches, and road-kill surveillance. Passive surveillance may include investigation of reports of wildlife morbidity or mortality.

Other Wildlife-Associated Activities

Field trials, pigeon races, and other wildlife-associated activities involving direct or indirect contact with wildlife occur throughout the United States. The Wildlife Section will identify all such activities, and determine whether they involve susceptible or nonsusceptible species. Information regarding these activities will be provided to the Quarantine and Disease Control Sections, and the Wildlife Section will assist in communicating with the affected groups.

Public Relations

Public support for response activities is essential for success. The general public, including various constituency groups such as consumptive and nonconsumptive wildlife users, sport-hunting interests, farmers, and animal welfare activists, will be affected by an HPAI outbreak. Public Affairs is responsible for providing information to the general public and the media and has developed key messages that will be delivered in concert with Federal, State, industry, and local entities. Key messages will be an integral part of media briefings held during an HPAI response. The Wildlife Section participated in developing messages concerning wildlife issues. All of the messages are included in USDA's Communications Emergency Response Plan.

III. Biosecurity and PPE

Properly implemented biosecurity during an HPAI outbreak is imperative as it will reduce the risk of virus transmission during the movement of personnel and material necessary for the extensive activities of the control and eradication campaign. (See USDA Biosecurity for the Birds on the Web at <http://www.aphis.usda.gov/vs/birdbiosecurity/>.)

Biosecurity: General Considerations

An outbreak of HPAI has a potentially serious impact on the agricultural industry and on public health. Accordingly, veterinarians, owners, and anyone else in contact with enterprises that have domesticated birds and other susceptible livestock should use strict biosecurity measures to prevent or slow the spread of HPAI.

In outbreaks with zoonotic potential, such as HPAI, PPE should be provided to persons involved in outbreak control and eradication activities as an additional biosecurity measure. The proper use of PPE and other personal protective measures in an animal health emergency are extremely important to the health and well-being of the equipment users and to their effectiveness as emergency responders.

Biosecurity measures also should be a routine part of an overall poultry health program. A sound biosecurity plan should be followed in daily practice. During an outbreak, adherence to a biosecurity plan becomes critical. This plan should address the movement of people, domesticated birds and other livestock, vehicles, and equipment; bird/animal handling, examination, treatment, depopulation/euthanasia, and necropsy; and disposal of bird/animal carcasses, products, feed, water, litter, straw, hay, and other materials potentially carrying HPAI.

Biosecurity Hazards

Identification of biosecurity hazards is a key element in preventing the introduction of AI viruses onto a premises. Common hazards include:

- **People, domesticated birds, other livestock, vehicles, and equipment.** All movements of domesticated birds and other livestock, vehicles, and equipment on and off the property will be controlled to reduce the risk of virus transmission. If it is necessary for persons to enter onto a premises, strict biosecurity protocols should be followed. In no case should unnecessary visits to a farm premises be allowed, especially by persons not trained to observe biosecurity measures.
- **Contaminated feed and water.** Feed should be purchased only from suppliers that have a quality assurance program in place for the safe manufacturing, storage, and delivery of their products.
- **Contact with domesticated birds and other livestock.** Exposure to AI viruses can occur in many situations where infected domesticated birds and other susceptible livestock come into contact, such as shows, swap meets, auctions, and in circumstances involving contact with

wildlife and during introduction or reintroduction of domesticated birds and other livestock into a flock or herd.

Mitigating Biosecurity Risk

The potential impact of major risk factors for introduction of AI viruses can be mitigated with appropriate biosecurity actions that include:

- Cleaning and disinfection of premises, vehicles, equipment, and materials, or disposal of contaminated materials that cannot be adequately cleaned or disinfected.
- Cleaning and disinfection of equipment before using for another purpose.
- Accounting for the recent history of all domesticated birds and other livestock at the premises of origin through accurate records.
- Accounting for the recent history of potentially contaminated equipment and bird/animal transport vehicles that entered or left the premises, including rendering trucks that may be used to haul carcasses away from the premises.
- Provide a place for people (employees, family, salespersons, veterinarians, farriers, service technicians, meter readers, visitors, etc.) to clean up, and insist that they do so, before and after contact with domesticated birds and other livestock, their products, secretions, and excretions.
- Separation of pick-up locations for dead domesticated birds and other livestock from rearing areas. The locations should have no cross traffic with farm personnel and vehicles.
- Isolation of domesticated birds and other livestock being added or returned to flocks or herds.

Housed Domesticated Birds and Other Susceptible Livestock

Under most circumstances, housed domesticated birds and other susceptible livestock are at reduced disease risk and should remain housed if possible. Biosecurity measures should be instituted at building entrances. Prevent wild bird entry into housing or eliminate wild birds from housing to avoid disease spread. Housing should also be designed to prevent entry of rodents and ground water. Domesticated birds and other livestock should not be moved into housing that has harbored infected or potentially infected domesticated birds and other livestock unless these buildings have first been thoroughly cleaned and disinfected.

Domesticated Birds and Other Susceptible Livestock Reared Outside

(See “USDA/APHIS Further Guidance on Biosecurity and Disease Prevention and Control for Non-confinement Poultry Production Operations” on the Web at http://www.aphis.usda.gov/newsroom/hot_issues/avian_influenza/contents/printable_version/non-confinement_poultry-ai_guidance4-18-06.pdf.)

If domesticated birds and other susceptible livestock are reared outside of a housed environment, biosecurity personnel should encourage owners to reduce the risk of **any** AI virus transmission by observing the following guidelines:

- Do not permit close or direct contact between groups of domesticated birds and other susceptible livestock. Keep them separated by a distance sufficient to prevent AI virus transmission.

- Inspect susceptible species regularly for signs of AI, and discuss any concerns with a veterinarian. If the presence of AI is suspected, the veterinarian should report this to the State Veterinarian or USDA, APHIS, VS, Area Veterinarian in Charge.
- Make every effort to avoid moving domesticated birds and other livestock.
- Minimize visitor contact, and ensure they follow biosecurity procedures.
- When visiting multiple sites in one day, visit the youngest animal group first. An exception to this is poultry. Poultry breeding stock should be visited before other commercial birds.
- Ensure that if travel between premises is necessary, each site is treated as a separate, biosecure unit (e.g., with observance of biosecurity and disinfection procedures for personal hygiene, clothing, footwear, vehicles, and equipment—both upon arrival and departure).

Clothing and PPE

Careful attention to clothing is an essential element of a successful biosecurity plan.

Outerwear may be either disposable or reusable, as discussed below. The level of PPE required in HPAI disease outbreak responses will be situation-specific and based on OSHA, CDC, and APHIS guidance. (See Appendix E.)

Disposable outerwear: It is highly recommended that all visitors and employees, regardless of their level of risk exposure or contact, be provided disposable coveralls, boots, hats, and gloves for use before entering a premises and before contact with domesticated birds and other livestock. Appropriate disposal of used PPE will be required before leaving any premises.

Reusable outerwear: If reusable (nondisposable) clothing is used, it must be machine washable. Waterproof or nylon coveralls may be purchased for use in wet, dirty conditions. Although nylon coveralls are not completely waterproof, they are less permeable than cotton and are less apt to soak through with moisture. They are also light and wind resistant and can withstand repeated machine washings well. Nylon coveralls may be damaged in automatic dryers if the heat is too high, but they air dry quickly. Reusable PPE such as fitted face masks, boots, and gloves will be disinfected before removal from the premises.

A Biosecurity Plan

A good biosecurity plan is important for the eradication and control of HPAI and for the routine maintenance of poultry health. Biosecurity minimizes HPAI spread via people, domesticated birds, other livestock, vehicles, and equipment from premises to premises during disease control and eradication efforts. Biosecurity plans should include planning for unavoidable breaks in biosecurity due to the need to protect life or property such as ambulance or fire truck entry. A basic biosecurity plan for attaining these goals—both in an emergency situation and in routine practice—consists of four essential elements:

1. Biosecurity awareness for all employees. Fatigue, stress, distraction, and lack of forethought all can cause even the most conscientious individual to forget the crucial importance of biosecurity measures. Thus, it is essential that all personnel exercise the utmost thought, patience, persistence, and care in creating and carrying out a biosecurity plan—both under normal circumstances and during a disease outbreak.
2. Design and implementation of cleaning and disinfection procedures to reduce or eliminate pathogens and pathogen transmission (see Cleaning and Disinfection section above).

3. Control of the movement of people, domesticated birds and other livestock, vehicles, and equipment.
4. Maintain a closed flock or herd to the fullest extent possible. Flocks and herds that are “closed” to the introduction of new domesticated birds and other livestock (with population increase occurring only from flock or herd offspring) decrease the potential for transmission of disease agents from “outside” domesticated birds and other livestock. If a closed flock or herd is not possible, isolate newly purchased domesticated birds and other livestock, purchased from the healthiest possible sources, and returning domesticated birds and other livestock (e.g., after breeding or exhibition) from existing flocks or herds for a suitable period of time. Vaccination status of introduced domesticated birds and other livestock should be known.

Identifying Domesticated Birds and Other Livestock

Individual or group identification for domesticated birds and other livestock is essential to the effective implementation of biosecurity measures. Identification:

- Enables the owner to keep track of domesticated birds and other livestock so their location and movement within the premises and movements on or off the premises can be documented accurately.
- Can be used to identify a flock that had direct contact with, or exposure to a bird or animal known to be infected.
- Permits tracking of individual or groups of domesticated birds and other livestock and facilitates the keeping of records on health, vaccination, pedigree, and production.

Keeping Records

Accurate records are essential during a disease outbreak to facilitate accurate tracing of individual or groups of domesticated birds and other livestock to determine possible source and potential spread of disease. Newly purchased domesticated birds and other livestock should be accompanied with records that include the vaccination history. Use of the National Animal Identification System, which has a standardized numbering system that would allow one number to be used for several purposes, would be ideal. Such information can be useful during an outbreak in tracing domesticated birds’ and other livestock’ possible exposure to disease (e.g., from distributor or producer to market or processing plant). Records can also help the owner keep track of feed, other supplies, and equipment that are brought into or removed from the premises.

Protecting Domesticated Birds and Other Susceptible Livestock From Wildlife

Rodents and most other forms of vermin and wildlife are very mobile and can biologically or mechanically spread the AI virus.

Isolation

Bringing domesticated birds and other livestock onto a premises poses a risk for introducing an AI virus into the resident population of that premises. Domesticated birds and other livestock should be purchased from flocks or herds known to have high health status, and litter, bedding, and feed should be obtained from sources known to be reputable.

Ideally, newly purchased domesticated birds and livestock or those being returned to the flock or herd should be isolated for a minimum of 30 days. This can be accomplished by confining the new domesticated birds and other livestock to locations that do not permit any form of direct or indirect contact with other domesticated birds and other livestock.

The caretaker of new or returning domesticated birds and other livestock that are in isolation should, at a minimum, have separate coveralls and boots available for use while caring for these domesticated birds and other livestock. This individual should care for the isolated domesticated birds and other livestock *after* taking care of the other domesticated birds and other livestock on the premises and should not return to the main flock or herd until he or she has taken a shower and donned clean clothing and boots.

Visitor Biosecurity and Risk in a Disease Outbreak

Visitors can come to a premises for a wide variety of reasons, from social calls to reading the electric meter, delivering feed, or vaccinating an animal. Each visit provides an opportunity for the transmission of AI viruses to domesticated birds and other susceptible livestock. In an outbreak situation, all visitors should be considered high risk, especially within a control area. When an outbreak occurs, officials typically establish a control area around infected and contact premises. As a general rule, premises inside a control area have a greater risk for exposure to AI virus and thus a greater necessity for implementation of rigorous biosecurity and cleaning and disinfection measures.

Visitor Biosecurity Outside a Control Area—If an outbreak of HPAI has occurred in the United States and a premises is located *outside* the control area, premises owners should ensure that visitors observe biosecurity and cleaning and disinfection measures commensurate with the level of perceived threat.

Visitor Biosecurity Within a Control Area—If a given premises is located within a control area, all visitors should be considered “high risk,” and strict biosecurity measures should be implemented. Therefore, premises visits must be kept to a minimum. Veterinary practitioners should try to limit their premises visits to one premises per day within a control area.

Personal Protection and Safety

Personal protection and safety guidance is based on optimal precautions to protect individuals from infection and illness while they are involved in a response to an HPAI outbreak, and to guard against the subsequent risk of viral reassortment (i.e., mixing of genes from human and avian viruses) if a human does become infected. Personnel involved in HPAI control and eradication activities on known affected or potentially affected premises are at increased risk for exposure to HPAI virus because those personnel frequently have prolonged and direct contact with infected birds or contaminated surfaces in an enclosed setting.

Upon notification of a confirmed detection of HPAI virus infection in avian or other animal species, public health authorities should initiate an investigation and implement appropriate public health measures. These measures will include surveillance (e.g., case finding to identify

persons who had known or potential exposures), primary prevention (e.g., infection control measures and antiviral prophylaxis), and if needed, case management.

APHIS Directive 6800.1 details the policy to ensure the safety of personnel engaged in HPAI control and eradication activities (see Appendix E). The policy is based on the risk known to be associated with various levels and types of exposures to HPAI viruses and should be considered complementary to avian disease control and eradication strategies as determined by State government, industry, or the USDA.

The NVS has been developed by USDA, APHIS, to serve as an emergency logistics capability for delivering vaccines, PPE, and other critical veterinary supplies within 24 hours. NVS exists to augment State and local resources. The decision to deploy will depend upon the type and scale of an outbreak and a determination by the incident command team (ICT) of whether State and local resources are sufficient to deal with the outbreak.

When an ICT requests assistance on behalf of a State, the NVS will deploy a shipment known as a “push package.” A “push package” contains essential equipment and supplies for a 10-day period to support the team in the outbreak response.

It is important to make a proper match between the type and degree of risk and the selection of a given protective measure. The first step in making this match is to conduct a thorough risk assessment. An effective risk assessment establishes:

- The composition and magnitude (concentration) of the biological or physical hazard;
- The length of time the equipment or device will be expected to perform at a known level of protection;
- The exertion level and extent of the physical work to be performed while using the equipment; and
- The environmental and physical conditions in which tasks are being performed.

Based on the information provided by the risk assessment, the Safety Officer can select the proper PPE.

Careful recordkeeping, reporting, and documentation are critical to a successfully managed personal protection program. All PPE-related training provided to personnel, including hazard communication and training in the selection, use, and maintenance of PPE will be documented.

The senior USDA, APHIS, manager or supervisor directly in charge has the overall responsibility for PPE availability, use, and effectiveness during an emergency. Assistance is available from the Safety Officer, associated safety personnel, and the response personnel who use the equipment.

The personnel to fill the positions of Safety Officer and associated safety personnel roles should be identified well before an animal health emergency occurs. Safety Officers must be given the authority and time to carry out their assigned duties and responsibilities before and during emergency situations.

IV. Communication and Education

The Role of USDA's Office of Communications

USDA's Office of Communications (OC) will review and coordinate all information programs; maintain the flow of information; and provide liaison between USDA agencies, mission areas, other Federal agencies, the mass communication media, State and local governments (including public health), and the public; and conduct operations from a USDA Joint Information Center (JIC) during an HPAI emergency. USDA will work with its federal and state partners, as well as industry, to ensure that messages are accurate and consistent.

In the event of an HPAI detection in U.S. domesticated birds, OC, in coordination with other USDA agencies and other Federal departments will be the lead on all communications activities associated with AI as an animal health issue.

Under the ICS, OC will assign a field Public Information Officer (PIO) with links to the JIC in order to support the incident command structure. Upon direction from the JIC, the field PIO represents and advises the Incident Command on all public information matters relating to management of the incident. The field PIO, in coordination with the JIC, handles on-scene media and public inquiries, emergency public information and warnings, rumor monitoring and response, media monitoring, and other functions to coordinate, clear with appropriate authorities, and disseminate accurate and timely information related to the incident, particularly regarding information on public health and safety and protection.

The following plan is to be used as a framework for a communications response to an emergency affecting USDA under the National Incident Management System (NIMS). NIMS, developed by the Secretary of the Department of Homeland Security (DHS) at the request of the President, integrates effective practices in emergency preparedness and response into a comprehensive national framework for incident management.

Communications Plan

NIMS Communication Goals

- To provide accurate, timely information to all identified audiences;
- To proactively inform and involve identified audiences about program activities;
- To be responsive to inquiries from various audiences about program activities;
- To create and disseminate informational materials on program activities to increase awareness and garner support;
- To communicate information to all identified audiences about program risks and risk-reducing measures;
- To provide direction to the Incident Commander on messages and response to target audiences; and
- To define communications protocols between Incident Commander and OC.

Target Audiences

In the event of an HPAI detection in commercial and noncommercial poultry, OC will actively communicate program project activities to other Federal agencies; media; State, city, and county governments; industry and stakeholders; trade partners; and the general public.

Overall Communications Objectives

- Provide accurate, timely, consistent information.
- Maintain credibility and instill public confidence in the Government's ability to respond to an outbreak.
- Minimize public panic and fear.
- Address rumors, inaccuracies, and misperceptions as quickly as possible.

General Public: To ensure public trust and reduce suspicion, fear, and anxiety, the general public must be kept informed. In addition to providing information through the media, OC will provide up-to-date information through a variety of information channels, including the Extension Service.

Governments: OC will work closely with USDA's Office of External and Intergovernmental Affairs as well as USDA's Office of Congressional Relations to inform State, county, city, and other Federal agencies' communications offices, in the event of a detection. These officials and entities will receive crucial program information and materials. **Note: The State official(s) in the affected State(s) will be notified first.**

Industry and Stakeholders: OC will work closely with USDA's Office of External and Intergovernmental Affairs and USDA's Office of Congressional Relations, USDA Agency Public Affairs Staff, as well as the Incident Commander and Incident PIO in contacting industry and stakeholder groups, including their public affairs representatives when possible, before publicly announcing actions that will impact those groups. These contacts will lend credibility to the project and garner support for the actions being taken. Industry and stakeholder groups also will be provided with related informational materials as they become available.

Media: Under NIMS, OC serves as USDA's primary liaison with the public and news media during an emergency situation. OC will ensure that timely and accurate emergency information is provided to the media with sensitivity to deadlines. As a means to better manage media inquiries and demonstrate responsiveness and transparency, OC will schedule regular media briefings.

Pre-event Staging

Informational Materials: OC staff will have available informational materials, such as press releases, statements, advisories, talking points, fact sheets, and questions and answers (Q&A) prepared in advance by the mission area agencies that could be immediately issued during an emergency situation. OC will work closely with the Incident Commander and Agency Public Affairs Staff to update these materials as additional information becomes available.

Public Service Messages: In the event of an HPAI detection, USDA will distribute public service messages through broadcast and print media channels. These messages will relay the following information:

- A detection of HPAI does not signal the start of a human pandemic;
- Properly prepared and cooked poultry is safe to eat; and
- How to report and handle dead birds.

These messages will be taped and recorded for mass distribution to television and radio stations in the affected and surrounding disaster areas. Additionally, these messages will be available in written form for print. Further, OC will issue media advisories and satellite feed alerts for mass distribution of messages through commercial radio and television, USDA satellite feed, and the USDA Web site. OC will maintain a paper and electronic library of all relevant USDA messages.

During an HPAI Event

Objectives

- Communicate actions the government is taking.
- Reassure the public that a detection in birds does not signal a human pandemic.
- Reassure the public that properly prepared poultry is safe to eat.
- Prepare the public for the possibility of more bird/animal cases.
- Prepare the public for the possibility of human illness from direct contact with infected birds.

Key Issues

- Effectiveness of surveillance
- Safety of commercial poultry
- Personal preparedness

Public Messages

This detection does not signal the start of a human flu pandemic.

- Human illness overseas has resulted predominantly from direct contact with sick or dead birds.
- There is no evidence that this virus is spread easily from person-to-person.
- HHS is watching closely for any sign the virus has changed into a form that can more easily infect people.

We are responding quickly and decisively to eradicate the virus.

- We have activated our response plan and a response team is on the scene or on the way.
- We will establish a quarantine to limit movement in the area.

- The birds will be humanely euthanized.
- The area will be disinfected and will not re-open until tests show the area is free of the virus.
- We have increased monitoring in the region to ensure quick detection if there are additional outbreaks.

Properly prepared eggs and poultry are safe to eat.

- Keep your hands, utensils, and surfaces clean.
- Cooking poultry to 165 degrees kills this virus and other germs.
- Any questions: call the USDA meat and poultry hotline – 1-888-MP HOTLINE.

Safeguarding the food supply.

- All poultry is processed under Federal or State inspection.
- We restrict the importation of poultry and products from countries with HPAI in commercial or traditionally raised flocks (not wild birds).
- Food regulations and standards ensure that commercial poultry and egg products are safe.

Industry Messages (Producers)

Protect your flocks and be vigilant in reporting signs of illness.

- Enhance biosecurity practices to prevent spread of the virus.
 - Permit only essential workers and vehicles to enter the farm to limit the chances of bringing the virus from an outside source.
 - Avoid visiting other poultry farms.
 - Disinfect shoes, clothes, hands, egg trays or flats, crates, vehicles and tires—all of which can carry the virus.
 - Protect your flocks from contact with wild birds.
- Know the signs of avian flu.
 - Signs include respiratory problems, such as coughing and sneezing, watery diarrhea, swelling around the head, neck, and eyes, loss of appetite.
- Report sick birds by calling 1-866-536-7593.
 - USDA has 400 veterinarians and a network of State veterinarians who can investigate a report of sick birds.
 - USDA compensates owners for domesticated birds/livestock destroyed as part of the eradication effort.

Tactics

Intergovernmental/stakeholder outreach:

- Internal USDA conference call with USDA agency public affairs and mission areas
- Federal interagency conference call (White House, HHS, DOI, DHS, White House Homeland Security Council, U.S. Department of State)

- Intergovernmental conference call with local/State governments (including animal health, human health, homeland security, and natural resources)
- Stakeholder conference call with poultry industry groups
- Congressional conference call or personal visits

Media outreach:

- Conduct press conference with HHS, State representative, and other relevant officials to discuss animal and human health implications, actions being taken, guidance for the public.
- Issue news release.
- Issue media advisory listing available resources (b-roll Beta tapes, still photos, Q&A, fact sheet, updated sound bytes via Web).
- Establish media briefing schedule to ensure predictable, established lines of communication with reporters to provide updates on management of the outbreak.
- Distribute Q&A and fact sheet and post on Web site.
- Provide b-roll tapes upon request (Ames laboratory testing/inspectors at plant).
- Post still photos on Web site (laboratory testing/inspectors at processing plant).
- Offer updated sound bytes via Web site.
- Monitor media 24/7 to promptly correct misinformation.

General public outreach:

- Distribute public service announcements (PSAs) and sound bytes containing key messages to radio stations.
- Post downloadable PSAs and sound bytes on USDA Web site.

Public Affairs Role

OC staff will plan, develop, supervise, and monitor communications activities related to the emergency, including:

- Construct a communications strategy related to the incident, including a media briefing schedule, and clear with Incident Commander and Secretary.
- Serve as a liaison with the Public Affairs Staff of all impacted Federal agencies.
- Act as a liaison between the Incident Command, JIC, the State Public Information Officer(s), other Federal agencies, industry, the public, and the media.
- Gather new and updated information regarding Agency response and status of detection, verify facts and clear within Administration channels.
- Arrange briefings and conference calls for the media.
- Coordinate and prepare the development of press releases, radio and television scripts, statements, advisories, talking points, questions and answers, fact sheets, and other informational materials for external use related to the situation.
- Respond to media and constituent queries.
- Monitor media reports and be prepared to correct misinformation.

Public Affairs Support

Detection of HPAI in United States

Once a detection of HPAI occurs in the United States, the USDA OC emergency response staff will work from USDA headquarters and maintain, if warranted, a 24/7 JIC for emergency communications coordination. Public affairs staff members from the DOI, HHS, and DHS will be invited to support the USDA JIC. When the JIC is activated, OC will send a field Public Information Officer who will link back to the JIC in order to support the ICS.

Incident of National Significance

If an HPAI outbreak is declared an incidence of national significance, under the National Response Plan and NIMS, OC emergency response staff will continue to work from USDA headquarters and maintain a 24/7 ready room for emergency communications coordination. OC will coordinate closely with DHS and assign a Public Information Officer to support the National JIC and ICS. The USDA Public Information Officer represents and advises the Incident Command on all public information matters relating to USDA and management of the incident. In a large-scale operation, the Public Information Officer serves as a field Public Information Officer with links to the JIC.

V. Appendices

Appendix A - Disinfectants: EPA-Approved Disinfectants with Efficacy Against AI

U.S. Environmental Protection Agency

Pesticides: Topical & Chemical Fact Sheets

Recent Additions | Contact Us Search: All EPA This Area

You are here: [EPA Home](#) » [Pesticides](#) » [Fact Sheets](#) » [Health and Safety](#) » [Antimicrobial Products to Disinfect Poultry and Other Facilities Against Avian \(Bird\) Flu](#) » Registered Antimicrobial Products with Label Claims for Avian (Bird) Flu

Registered Antimicrobial Products with Label Claims for Avian (Bird) Flu Disinfectants

Current as of July 13, 2007

These EPA disinfectant products are registered and labeled with a claim to inactivate "avian influenza A" viruses on hard, non-porous surfaces. The label specifies the use sites (e.g., poultry houses and farm premises) for application of the product. Although there are no antimicrobial products registered specifically against the H5N1 subtype of **avian influenza A** viruses, EPA believes based on available scientific information that the currently registered **avian influenza A** products, when applied in strict accordance with the label directions, will be effective against the H5N1 strain. These disinfectants are available at retail establishments which sell to those in the poultry industry. Users should look for an EPA registration number on the label (e.g., EPA Reg. No. XXX-XX). Each manufacturer's name and telephone number are provided so that potential product users may contact the manufacturer to find out how to obtain a listed product. [General information about disinfecting for avian flu.](#)

For More Information

- National Pesticide Information Center (NPIC)
800-858-7378 (6:30am - 4:30pm PT, M-F)
[EXIT Disclaimer](#)

Users should carefully follow the disinfection directions on the label to handle and safely use the pesticide product and avoid harm to human health and the environment. The approved label of a product can be found in the [Pesticide Product Label System \(PPLS\) database label search site](#). To obtain a product label, enter the EPA Registration Number of the primary product in the search query boxes (i.e., the company identification number and the product number) of the PPLS database. Information about the Pesticide Product Label System (PPLS) database is posted on the [PPLS homepage](#).

Registration Number	Product Name	*Active Ingredient	Formulation Type	** <u>Manufacturer Contact Information</u>
106-72	Maxima 128	<u>5, 9, 10, 19</u>	soluble concentrate	Bruln & Company, Inc.>
106-73	Maxima 256	<u>5, 9, 10, 19</u>	soluble concentrate	Bruln & Company, Inc.
106-79	Broadspec 256	<u>5, 9, 10, 19</u>	soluble concentrate	Bruln & Company, Inc.
106-81	Maxima RTU	<u>5, 9, 10, 19</u>	solution-ready to use	Bruln & Company, Inc.
134-65	DC&R Disinfectant	<u>2, 7, 12</u>	soluble concentrate	Hess & Clark, Inc.
211-25	Pheno Cen Germicidal Detergent	<u>17, 20, 24</u>	soluble concentrate	Central Solutions, Inc.
211-32	Pheno Cen Spray Disinfectant	<u>11, 16</u>	pressurized liquid	Central Solutions, Inc.
211-50	Q5.5-5 NPB 2.5 HW	<u>5, 9, 10, 19</u>	soluble	Central Solutions,

Registration Number	Product Name	*Active Ingredient	Formulation Type	**<u>Manufacturer Contact Information</u>
			concentrate	Inc.
211-62	Low pH Phenolic>	<u>1, 16</u>	soluble concentrate	Central Solutions, Inc.
303-91	Hi-Tor Plus Germicidal	<u>5, 9</u>	soluble concentrate	Huntington Professional
464-689	Ucarsan Sanitizer 420	<u>13</u>	soluble concentrate	The Dow Chemical Company
464-696	Ucarsan Sanitizer 4128	<u>13</u>	soluble concentrate	The Dow Chemical Company
464-700	Ucarcide 14 Antimicrobial	<u>5, 13</u>	solution-ready to use	The Dow Chemical Company
464-702	Ucarcide 42 Antimicrobial	<u>5, 13</u>	solution-ready to use	The Dow Chemical Company
464-715>	Ucarsan 442 Sanitizer	<u>5, 13</u>	soluble concentrate	The Dow Chemical Company
464-716	Ucarsan 414 Sanitizer	<u>5, 13</u>	soluble concentrate	The Dow Chemical Company
777-72	Biosol	<u>5, 11</u>	Ready to Use Liquid	Reckitt Benckiser
1043-91	LpH Master Product	<u>3, 16</u>	soluble concentrate	Steris Corporation
1677-129	Oxonia Active	<u>15, 21</u>	soluble concentrate	Ecolab, Inc.
1677-158	Vortexx	<u>14, 18, 21</u>	soluble concentrate	Ecolab, Inc.
1677-203	OxySept LDI	<u>14, 21</u>	soluble concentrate	Ecolab, Inc.
1839-86	BTC 2125 M 10% Solution	<u>4, 6</u>	soluble concentrate	Stepan Company
1839-95	NP 4.5 (D &F) Detergent/Disinfectant	<u>4, 6</u>	Soluble concentrate	Stepan Company
1839-154	Scented 10% BTC 2125M Disinfectant	<u>4, 6</u>	soluble concentrate	Stepan Company
1839-155	BTC 2125M 20% Solution	<u>4, 6</u>	soluble concentrate	Stepan Company
1839-173	7.5% BTC 885 Disinfectant	<u>5, 9, 10, 19</u>	soluble concentrate	Stepan Company
3838-36	Quat 44	<u>4, 6</u>	soluble concentrate	Essential Industries, Inc.

Registration Number	Product Name	*Active Ingredient	Formulation Type	**<u>Manufacturer Contact Information</u>
3838-37	Quat Rinse	<u>4, 6</u>	soluble concentrate	Essential Industries, Inc.
3862-177	Tek-Trol Disinfectant	<u>1, 3, 16</u>	soluble concentrate	ABC Compounding Co.
5813-1	Clorox	<u>30</u>	Soluble concentrate	Clorox Company
6659-3	Spray Nine	<u>4, 6</u>	Ready to Use Liquid	Spray Nine Corporation
6836-70	Bardac 205M-7.5B	<u>5, 9, 10, 19</u>	soluble concentrate	Lonza, Inc.
6836-71	Lonza Formulation Y-59	<u>5, 9, 10, 19</u>	soluble concentrate	Lonza, Inc.
6836-75	Lonza Formulation S-21	<u>5, 10, 11, 21</u>	soluble concentrate	Lonza, Inc.
6836-77	Lonza Formulation S-18	<u>5, 10, 11, 21</u>	soluble concentrate	Lonza, Inc.
6836-78	Lonza Formulation R-82 >	<u>5, 9, 10, 19</u>	soluble concentrate	Lonza, Inc.
6836-136	Lonza Formulation S-18F	<u>5, 9, 10, 19</u>	soluble concentrate	Lonza, Inc.
6836-139	Lonza Formulation R-82F	<u>5, 9, 10, 19</u>	soluble concentrate	Lonza, Inc.
6836-140	Lonza Formulation S-21F	<u>5, 9, 10, 19</u>	soluble concentrate	Lonza, Inc.
6836-152	Lonza Formulation DC-130	<u>5, 9, 10, 19</u>	solution-ready to use	Lonza, Inc.
6836-233	Bardac 205M-50	<u>5, 9, 10, 19</u>	soluble concentrate	Lonza, Inc.
6836-252	Phencide 256	<u>1, 16</u>	soluble concentrate	Lonza, Inc.
6836-253	Phenocide 128	<u>1, 16</u>	soluble concentrate	Lonza, Inc.
6836-266	Bardac 205M-10	<u>5, 9, 10, 19</u>	soluble concentrate	Lonza, Inc.
6836-277	Bardac 205M 1.30	<u>5, 9, 10, 19</u>	soluble concentrate	Lonza, Inc.
6836-278	Bardac 205M 14.08	<u>5, 9, 10, 19</u>	soluble concentrate	Lonza, Inc.
6836-302	Bardac 205M 5.2	<u>5, 9, 10, 19</u>	soluble	Lonza, Inc.

Registration Number	Product Name	*Active Ingredient	Formulation Type	**<u>Manufacturer Contact Information</u>
6836-303	Bardac 205M 7.5B	<u>5, 9, 10, 19</u>	concentrate soluble concentrate	Lonza, Inc.
8155-23	Husky 806 H/D/N	<u>9</u>	Soluble concentrate	Canberra Corporation
8383-3	Sporicidin Brand Disinfectant solution	<u>22, 31</u>	Ready to use Liquid	Sporicidin International
70060-19	Aseptrol S10-Tablets	<u>27, 28</u>	Pellet/tablet	Engelhard Corporation
70144-1>	Opticide-3	<u>4, 6</u>	Ready to Use	Micro-Scientific Industries
71654-7	Virkon	<u>21, 22</u>	Pellet/tablet	DuPont Chemical Solutions
74331-2	DisinFx	<u>8, 23, 14</u>	Ready to use Liquid	SteriFx Inc.
74559-1	Accel TB	<u>13</u>	Ready-to-Use Liquid	Virox Technologies
10324-56	Maquat 256	<u>4, 6</u>	<u>soluble concentrate</u>	Mason Chemical Company
10324-58	Maquat 128	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-59	Maquat 64	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-63	Maquat 10	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-67	Maquat MQ615-AS	<u>5, 8, 9, 17</u>	soluble concentrate	Mason Chemical Company
10324-72	Maquat 615 HD	<u>5, 9, 10, 19</u>	soluble concentrate	Mason Chemical Company
10324-80	Maquat 5.5M	<u>5, 9, 10, 19</u>	soluble concentrate	Mason Chemical Company
10324-81	Maquat 705M	<u>5, 9, 10, 19</u>	soluble concentrate	Mason Chemical Company
10324-85	Maquat 86 M	<u>5, 9, 10, 19</u>	solution-ready to use	Mason Chemical Company
10324-94	Maquat 20M	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-96	Maquat 50DS	<u>4, 6</u>	soluble concentrate	Mason Chemical Company

Registration Number	Product Name	*Active Ingredient	Formulation Type	**<u>Manufacturer Contact Information</u>
10324-99	Maquat 10	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-115	Maquat 750 M	<u>5, 9, 10, 19</u>	soluble concentrate	Mason Chemical Company
10324-117	Maquat 710 M	<u>5, 9, 10, 19</u>	soluble concentrate	Mason Chemical Company
10324-118	Maquat 256 EBC	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-119	Maquat 128 EBC	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-120	Maquat 64 EBC	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-131	Maquat A	<u>5, 9, 10, 19</u>	soluble concentrate	Mason Chemical Company
10324-141	Maquat 256-NHQ	<u>5, 9</u>	Soluble concentrate	Mason Chemical Company
10324-142	Maquat MQ2425 M 14	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-143	Maquat 10B	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-145	Maquat FP	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
10324-162	Maquat 2420 Citrus	<u>5, 9</u>	soluble concentrate	Mason Chemical Company
10324-164	Maquat 256 PD	<u>4, 6</u>	soluble concentrate	Mason Chemical Company
11600-4	Sanox II	<u>5, 9, 10, 19</u>	soluble concentrate	Conklin Co., Inc.
47371-6	Formulation HS 652Q	<u>5, 9</u>	soluble concentrate	H&S Chemicals Division
47371-7	Formulation HS 821Q	<u>5, 9</u>	soluble concentrate	H&S Chemicals Division
47371-36	HS-867Q	<u>5, 9</u>	soluble concentrate	H&S Chemicals Division
47371-37	HS-267Q germicidal Cleaner	<u>5, 9</u>	soluble concentrate	H&S Chemicals Division
47371-141	Formulation HH 652Q	<u>5, 9</u>	soluble concentrate	H&S Chemicals Division
56392-7	Dispatch Hospital	<u>30</u>	Ready to use	Caltech Industries

Registration Number	Product Name	*Active Ingredient	Formulation Type	**<u>Manufacturer Contact Information</u>
56392-8	Cleaner with Bleach Dispatch Hospital Cleaner Disinfectant Towels with Bleach	<u>30</u>	Liquid Ready to use Towelette	Caltech Industries
61178-1	D-125	<u>4, 6</u>	soluble concentrate	Microgen Inc.
61178-2	Public Places	<u>4, 6</u>	solution-ready to use	Microgen Inc.
61178-4	Public Places Towelette	<u>4, 6</u>	impregnated materials	Microgen Inc.
61178-5	CCX-151	<u>4, 6</u>	soluble concentrate	Microgen Inc.
61178-6	D-128	<u>4, 6</u>	soluble concentrate	Microgen Inc.
63761-8	Sterilex Ultra Disinfectant Cleaner	<u>4, 6, 15</u>	Soluble concentrate	Sterilex Corporation
66171-1	Advantage 256	<u>1, 3, 16</u>	soluble concentrate	Preserve International
66171-6	Dyne-O-Might	<u>32</u>	soluble concentrate	Preserve International
66171-7	Synergize	<u>7, 13</u>	soluble concentrate	Preserve International
66243-1	Odo-Ban Ready to Use	<u>5</u>	solution-ready to use	Clean Control Corporation
66243-2	Odo-Ban	<u>5</u>	soluble concentrate	Clean Control Corporation
66243-3	Quik Control	<u>5, 9, 10, 19</u>	soluble concentrate	Clean Control Corporation
67619-8	CPPC Ultra Bleach 2	<u>30</u>	Soluble concentrate	Clorox Professional Services Company
67619-9	PJW-622	<u>4, 6</u>	impregnated materials	Clorox Professional Products Co.
67619-13	CPPC Storm	<u>30</u>	Ready to use Liquid	Clorox – professional Services Company
70144-2	Opticide-3 wipes	<u>4, 6</u> >	Ready to Use Towelette	Micro-scientific Industries
70263-6	Microban QGC	<u>5, 9, 10, 19</u>	soluble concentrate	Microban Systems, Inc.

Registration Number	Product Name	*Active Ingredient	Formulation Type	**Manufacturer Contact Information
70263-8	Microban Professional	<u>5, 9, 10, 19</u>	solution-ready to use	Microban Systems, Inc.
70627-2	Disinfectant DC 100	<u>4, 6</u>	solution-ready to use	Johnson Diversey, Inc.
70627-6>	Phenolic Disinfectant HG	<u>1, 16</u>	soluble concentrate	Johnson Diversey, Inc.
70627-10	Johnson's Forward Cleaner	<u>5</u>	soluble concentrate	Johnson Diversey, Inc.
70627-15	Johnson's Blue Chip Germicidal	<u>5</u>	soluble concentrate	Johnson Diversey, Inc.
70627-21	Virex II 128	<u>5, 9</u>	soluble concentrate	Johnson Diversey, Inc.
70627-22	Virex RTU	<u>5, 9</u>	solution-ready to use	Johnson Diversey, Inc.
70627-23	Virex II 64	<u>5, 9</u>	soluble concentrate	Johnson Diversey, Inc.
70627-24	Virex II 256	<u>5, 9</u>	soluble concentrate	Johnson Diversey, Inc.
71355-1	Virocid	<u>5, 10, 15</u>	soluble concentrate	CID Lines, NV/SA
71654-6	Virkon S	<u>25, 26</u>	soluble concentrate	DuPont Chemical Solutions
71847-2	Klor-Kleen	<u>29</u>	pelletted/tableted	Medentech, Ltd.
81073-1	Peridox	<u>15, 21</u>	soluble concentrate	Clean Earth Technologies,

Active Ingredient **Active Ingredient Key**

- 1 2-Benzyl-4-chlorophenol (62201)
- 2 2-(Hydroxymethyl)-2-nitro-1,3-propanediol (83902)
- 3 4-tert-Amylphenol (64101)
- 4 Alkyl dimethyl benzyl ammonium chloride (60%C14, 30%C16, 5%C18, 5%C12) (69104)
- 5 Alkyl dimethyl benzyl ammonium chloride (50%C14, 40%C12, 10%C16) (69105)
- 6 Alkyl dimethyl ethylbenzyl ammonium chloride (68%C12, 32%C14) (69154)
- 7 Alkyl dimethyl benzyl ammonium chloride (67%C12,

Active Ingredient	Active Ingredient Key
	25%C14, 7%C16, 1%C18) (69175)
8	Citric Acid
9	Didecyl dimethyl ammonium chloride (69149)
10	Diocetyl dimethyl ammonium chloride (69166)
11	Ethyl alcohol (1501)
12	Formaldehyde (43001)
13	Glutaraldehyde (43901)
14	Hydrochloric Acid
15	Hydrogen peroxide (595)
16	o-Phenylphenol (64103)
17	o-Phenylphenol, potassium salt (64108)
18	Octanoic acid (128919)
19	Octyl decyl dimethyl ammonium chloride (69165)
20	p-tert-Amylphenol, potassium salt (64111)
21	Peroxyacetic acid (63201)
22	Phenol
23	Phosphoric Acid
24	Potassium 2-benzyl-4-chlorophenate (62202)
25	Potassium peroxymonosulfate (63604)
26	Sodium chloride (13905)
27	Sodium chlorites
28	Sodium dichloroisocyanurate dihydrate
29	Sodium dichloro-s-triazinetrione (81404)
30	Sodium hypochlorite
31	Sodium phenate
32	Iodine

Appendix B - Procedures for Investigating a Suspected Foreign Animal Disease/Emerging Disease Incident (FAD/EDI)

This memorandum states that the Area Veterinarian in Charge (AVIC) will initiate a timely investigation of all reported suspect FAD/EDIs.

The specific responsibilities of the AVIC include:

- Prepare a case report which will include a reference control number; suspected disease condition and species affected; date of initial report; species, breed, or type and number of livestock on the premises; number of livestock affected and duration of illness; the premises owner's or manager's contact information; contact information for private practitioner reporting the disease; and, for State or military foreign animal disease diagnosticians (FADDs), the web site address for access to the Emergency Management Response System (EMRS) FAD/EDI investigation database;
- Ensure an investigation is initiated within 8 hours of the initial report and the inspection of livestock is done as soon as possible;
- Ensure the appropriate priority for the laboratory has been assigned when the FADD has completed the investigation. Emergency Management (EM) staff should be immediately contacted by telephone when Priority 1 or Priority A has been assigned to a specimen; Follow established reporting procedures;
- Ensure that preliminary information is entered into EMRS;
- Monitor investigation and provide follow-up until there is a determination of no FAD/EDI. Ensure the "status type" is changed to "diagnosis negative" for FAD to close a case and ensure the laboratory results are entered into the EMRS sample/laboratory report form;
- Forward preliminary and final results to the FADD and other involved parties for notification.

After the AVIC assigns the case to the FADD he or she must:

- Immediately contact the private veterinarian or owner/producer, initiate an investigation, and review EMRS FAD/EDI investigation summary information and Herd Exam form prior to performing the investigation;
- Assess the situation, including physical exam findings, vaccination history, herd health practices;
- Formulate a list of differential disease diagnoses;
- Contact the Foreign Animal Disease Diagnostic Laboratory (FADDL) or NVSL personnel and use their expertise;
- Conduct a thorough epidemiological investigation to include at minimum information about the duration of illness, potential exposures, temperatures from sampled live livestock, vaccination history, animal movement, and human health (for possible zoonoses);
- Contact the AVIC to report findings of the investigation immediately after the investigation is complete, and in consultation with the AVIC, determine the laboratory priority for diagnostic specimens based upon investigative findings;
- Inform the AVIC of a decision to quarantine;

- Contact the appropriate laboratory by phone prior to shipping samples (regardless of priority) to provide priority number, tracking number, and day of arrival;
- Ship diagnostic specimens in good condition and in proper packaging to the proper laboratory (either FADDL; Plum Island, New York; or NVSL-Ames);
- Complete all appropriate follow-up forms immediately after submitting laboratory samples;
- E-mail the EMRS FAD/EDI investigation report to the AVIC when data entry is completed;
- Follow up with the AVIC to ensure closure of investigations within a week of receiving final laboratory results, along with any follow-up information that rules out a FAD/EDI.

A complete report is necessary whether or not diagnostic specimens are collected and submitted.

AVIC Reporting Responsibilities - The AVIC must:

- Immediately contact EM staff by telephone for all possible priority cases;
- Notify the Regional office;
- Inform and consult with the State Veterinarian and Tribal official;
- Ensure that a completed electronic EMRS FAD/EDI Investigation Summary and all forms are forwarded to the State Veterinarian's office.

FADD Reporting Responsibilities - The FADD must:

- Report initial findings of the investigation, as soon as the investigation is complete, to the AVIC;
- Immediately notify the appropriate laboratory (regardless of priority) that samples have been collected and are on their way to NVSL-Ames or FADDL;
- Notify the necessary State or Tribal officials to initiate quarantine, if appropriate;
- Update an electronic EMRS FAD/EDI Investigation Summary with verified information and GPS coordinates;
- Complete the necessary forms;
- Provide appropriate control and tracking numbers;
- Provide the following information:
 - City, county, and State of premises under investigation;
 - Name of the owner/manager;
 - Species, breed, or type, and number of livestock on premises;
 - History of the disease;
 - Presumptive field diagnosis with differentials;
 - Priority of the samples;
- Send the AVIC by e-mail the updated EMRS FAD/EDI Investigations Summary before specimens arrive at the designated laboratory.

If the FADD is unable to immediately e-mail the FAD/EDI Investigation Summary, he or she should contact the AVIC to provide the tracking number, obtain a priority number, and indicate to which laboratory the specimens were submitted. The FADD should also consult and follow up with the veterinary practitioner and owner/manager to keep them informed of the investigation process.

Please note that EMRS must be used throughout the investigation. The AVIC, FADD, and laboratory personnel must enter all information specified in this document and any other pertinent information that emerges during the investigation into the EMRS.

NVSL-Ames and/or FADDL will report preliminary and final laboratory results to the AVIC and EM staff for all specimens, regardless of the assigned priority number. The FADD, after consultation with the AVIC, will inform the owner/manager and referring veterinarian of the laboratory test results as soon as possible once test results have been obtained. The AVIC will ensure that all laboratory results are listed on the Sample Lab Report form.

The NVSL Director will immediately report positive or suspect laboratory findings to the Deputy Administrator's Office and Associate Deputy Administrator for Emergency Management. EM Staff will coordinate a conference call with the Deputy Administrator's Office, RD, AVIC, FADD, State Veterinarian, appropriate laboratory personnel, and the Emergency Management Leadership Team (EMLT) for future action planning. This conference call will occur within 2 hours of when EM received notification.

Classifying an FAD/EDI investigation as a "presumptive case" or "confirmed case" is the responsibility of the Deputy Administrator. Investigations for suspected FAD/EDIs will be closed by the AVIC and/or the State Veterinarian. Cases should not be closed until a follow-up visit or phone call has been made by the FADD and the owner/manager is informed of the laboratory results. The electronic EMRS FAD/EDI Investigation Summary form will be used to record all follow-up information, laboratory results, quarantine release dates, etc.

The AVIC should ensure that a Sample Lab Report form is completed. The form should state the laboratory results. If the laboratory results are negative for an FAD/EDI investigation, following consultation and concurrence with the FAD and others, the AVIC will open the Status Form to designate the final diagnosis for the case and close the case.

For additional information see VS Memorandum 580.4.

Appendix C - Notifiable Avian Influenza Case Definition

Notifiable Avian Influenza (NAI) Case Definition

Clinical Description

The clinical manifestations and mortality from NAI H5/H7 infections can vary considerably depending on species, age, sex, concurrent infections, virus strain, and environmental conditions. The digestive, respiratory, nervous, reproductive, or circulatory systems may be affected. Surveillance programs may detect NAI H5/H7 infection with no clinical signs.

Clinical Case Definition^{1, 2}

Flocks of domestic poultry 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; subcutaneous hemorrhage of legs; lungs filled with fluid and blood; tracheitis and airsacculitis; petechial hemorrhages on internal organs; OR flocks that experience mortality listed for each compartment meet the clinical case definition for NAI H5/H7.

- Commercial broilers: mortality exceeding 4 birds / 1000 per day for 2 consecutive days.
- Commercial layers: 4 times normal daily mortality for 2 consecutive days (0.5 per 1000 per day for layers from 2 to 50 weeks and 0.75 per 1000 per day for layers over 50 weeks) or 5 percent drop in egg production over 3 days.
- Commercial turkeys: mortality in excess of 2 birds / 1000 per day.
- Backyard flocks: any sudden and significant mortality event or sudden drop in egg production should be investigated.
- Depending on the pathogenicity of the virus; birds raised on litter may experience rapidly spreading mortality. Mortality in birds reared in cages (e.g. layers, quail) may progress more slowly over a 10-15 day period.³

Epidemiologic Criteria and Restrictions

- The clinical case definition will help find the first case of a NAI H5/H7 in the U.S. in commercial poultry, the live bird marketing system, or in non-traditional poultry (backyard flocks).
- Compartmentalization creates a functional separation of the commercial poultry industry, the live bird marketing system, non-traditional backyard poultry flocks, and wild migratory waterfowl through management practices. It is verified through surveillance.
 - Commercial poultry breeder surveillance (including game bird breeders) is conducted through the National Poultry Improvement Plan.
 - 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 proposed NPIP commercial surveillance program.

- Live bird marketing system surveillance occurs through cooperative agreements between USDA-VS and participating state animal health officials. State programs often exceed USDA-VS minimum standards.
- Surveillance of non-traditional backyard compartment occurs through individual state surveillance programs in cooperation with USDA, APHIS.

Laboratory Criteria for Diagnosis

Infections identified through surveillance or compatible clinical signs and pathologic lesions in a susceptible species plus one or more of the following:

- Isolation in embryonated fowl eggs ⁽¹⁾ and confirmation of the presence of influenza A virus by hemagglutination activity; and,
- Determination of H5/H7 subtype by hemagglutinin and neuraminidase inhibition testing; and,
- Classification of the isolate as Highly Pathogenic Notifiable Avian Influenza (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,
- Determination of the base sequence of the hemagglutinin precursor protein (HA0) cleavage site to identify viruses that have the capacity to become highly pathogenic.
- H5 or H7 subtypes that do not meet the criteria for HPNAI are classified as Low Pathogenicity Notifiable Avian Influenza (LPNAI).

⁽¹⁾ Tracheal or cloacal swabs (or feces) from live birds; or feces and pooled organ samples from dead birds (trachea, lungs, air sacs, intestine, spleen, kidney, brain, liver, and heart).⁴

Assumptions:

- Influenza virus may be detected 48 hours post infection (HPAI by 24 hours PI) by real-time reverse-transcriptase polymerase chain reaction (RRT-PCR); and 1-5 days post infection by antigen capture enzyme immunoassay (AC-EIA).⁵
- RT-PCR tests on samples containing fecal material (i.e., cloacal swabs) lack sensitivity compared with the high sensitivity and specificity relative to virus isolation for tracheal samples.

Case Classification

Suspect Case

- A tentative diagnosis of NAI based on the clinical case definition in consultation with State Animal Health Officials and the Area Veterinarian in Charge; or,
- Positive laboratory samples taken during routine surveillance with or without the presence of clinical criteria.

Presumptive Case

Meets the suspect criteria; and,

- Detection of antibodies ⁽²⁾ to influenza A in sera as determined by the Agar Gel Immunodiffusion (AGID) serological test which cannot be explained by vaccination; and subsequent subtyping by hemagglutination inhibition and identification as H5 or H7; or
- Detection of influenza A antigen using a commercially available influenza A antigen detection kit approved by the NPIP administrator and determination is H5/H7; or, ⁶
- Identification of influenza A RNA by real time RT-PCR ⁽³⁾ and determination of subtype as H5/H7.

⁽²⁾ Antibodies may be detected as early as day 7-10 post infection in birds raised on litter.² An acute serum sample should be taken as soon as clinical signs are evident, and a convalescent sample should follow 7 to 28 days later.

⁽³⁾ Cloacal or tracheal swab or environmental samples (Live Bird Market Program). ⁷

Confirmed Index Case

- Isolation of an influenza A virus and identification as an H5 or H7 subtype (NAI) and subsequent determination of pathogenicity (High Pathogenicity or Low Pathogenicity NAI) by the National Veterinary Services Laboratory.

Required Comments

- H5/H7 NAI infections in commercial poultry should be reported in accordance with VS Memo 565.14.
- State animal health officials should report the presence or absence of NAI in commercial poultry following OIE guidelines through the National Animal Health Reporting System.

Review Teams

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References

¹ Elbers, Armin R. W., G. Koch, and A. Bouma. Performance of clinical signs in poultry for the detection of outbreaks during the avian influenza A (H7N7) epidemic in The Netherlands in 2003. *Avian Pathology* Vol. 34, Number 3/June 2005.

² Easterday B.C., V.S. Hinshaw, D.A. Halvorson. Influenza. In B.W. Calnek, H.J. Barnes, C.W. Beard, L.R. McDougald & Y.M. Saif (eds), *Diseases of Poultry* 10th ed. (pp 541-569 Ames: Iowa State Press.

³ Swayne, David E. "The Global View of High Pathogenicity Avian Influenza" (presentation given at the executive briefing: The Georgia Response Plan for Highly Pathogenic Avian Influenza in Poultry, Duluth, GA., May 16, 2006). United States Department of Agriculture, Agriculture Research Service, Southeast Poultry Research Laboratory, Center Director.

⁴ World Organization for Animal Health (OIE), *Terrestrial Animal Health Code*, 14th edition, 2005. and *Terrestrial Manual*, 5th edition, 2004.

⁵ Spackman, Erica. Personal Communication. United States Department of Agriculture, Agriculture Research Service, Southeast Poultry Research Laboratory.

⁶ The National Poultry Improvement Plan. United States Department of Agriculture. <<http://www.aphis.usda.gov/vs/npip/>>.

⁷ United States Department of Agriculture, Prevention and Control of H5 and H7 Low Pathogenicity Avian Influenza in the Live Bird Marketing System: Uniform Standards for a State-Federal-Industry Cooperative Program, October 20, 2004.

Appendix D - Disposal Options

Options for Disposal of HPAI H5N1 Affected Avian Carcasses

Effective eradication of HPAI H5N1 virus requires the timely and safe disposal of avian carcasses, which in turn reduces the risk of disease spread within bird populations and eliminates the presence of HPAI H5N1 virus in the environment. A strategy for large-scale carcass disposal must be in place well in advance of a domestic or foreign animal disease emergency to maximize the efficiency of response.

The most effective disposal strategy is one that uses the most suitable disposal options available. The decision on which disposal strategy to use must be based on many local and case-specific factors. Disposal methods can be evaluated using several factors:

- Effective – Minimizes potential for spread of pathogen (to livestock or humans)
- Environmentally sound – Minimizes environmental impacts
- Rapid – Facilitates completion of disposal within 24 hours of euthanasia
- Acceptable to stakeholders – Minimizes impact to poultry operations
- Low cost - Minimizes need for labor, equipment, chemicals, utilities, and fuel

All disposal options should remain open prior to evaluation of a specific situation. Differences in site-specific characteristics and conditions, and the capacity of a given disposal method relative to the volume of carcasses to be disposed, will greatly influence the final choice of a disposal option.

Disposal Methods

Available disposal methods for HPAI H5N1 affected avian carcasses can be divided into two categories: on-site or off-site.

- On-Site
 - composting²
 - treatment (mobile incinerators, mobile digesters)
 - burial
- Off-Site
 - composting
 - landfilling
 - treatment (rendering, incineration, digestion)

The efficacy of each carcass disposal method depends on the field conditions at a specific site, including but not limited to: climate; time of year; soil type; depth to groundwater; development density of property; distance from other poultry operations; distance to offsite disposal/treatment facilities; local environmental regulations; and public perception. Site managers must ultimately make decisions regarding the appropriate disposal method based on the unique factors of that site.

² A study by the University of Delaware and the University of Maryland has shown that composting temperatures reach approximately 140°F after 2 to 3 days. Senne et al. (1994) found that HPAI virus was inactivated at the end of the first 10 days of composting.

Disposal Preferences

Although off-site disposal may be the best option available in some circumstances, preference will generally be given to on-site methods as they facilitate the containment of virus spread. On-site carcass disposal, assuming sufficient land area and availability of labor, may be the most efficacious method to reduce the risk of spread of HPAI H5N1 virus because off-site transport of carcasses is eliminated. The overall order of preference for the various disposal alternatives when dealing with HPAI H5N1 affected carcasses is:

- 1) On-site composting
- 2) On-site treatment (mobile incinerators, mobile digesters)
- 3) On-site burial
- 4) Off-site composting
- 5) Off-site landfill or off-site treatment (rendering, incineration, digestion)

More information on the characteristics of the various disposal methods is given in the following table.

Characteristics of Disposal Method Options for HPAI H5N1 Affected Avian Carcasses				
Method / Technology	On-Site vs. Off-Site	Capacity Tons/day (TPD)	Pros	Cons
Composting	On-Site or Off-Site	Potentially large (location dependent)	- Destroys virus, if done properly.	- Possible spread of the virus (aerosol, vectors) if pile not covered adequately prior to virus inactivation. - Possible groundwater or surface water contamination if pile not adequately insulated. - Not rapid.
Incineration: Air Curtain Incinerators	On-Site or Off-Site	Variable	- Destroys virus. - Relatively inexpensive and rapid, if equipment readily available.	- Potentially expensive, especially if equipment not readily available. - Residue issues; potential for air, surface water, or groundwater contamination. - Ability to use is site specific. - Requires skilled operators. - May be difficult to efficiently incinerate avian carcasses.
Incineration: Mobile Incinerators	On-Site or Off-Site	Variable	- Destroys virus. - May be relatively rapid.	- Availability and capacity of units. - May require air monitoring. - Public perception. - Potentially expensive. - Requires skilled operators. - May be difficult to efficiently incinerate avian carcasses.
Digestion: Alkaline Hydrolysis	On-Site or Off-Site	Up to 5 TPD	- Destroys virus. - Can be mobile for on-site use.	- Liquid discharge may present disposal concerns. - Requires skilled operators. - Disinfection of unit exterior.

Characteristics of Disposal Method Options for HPAI H5N1 Affected Avian Carcasses				
Method / Technology	On-Site vs. Off-Site	Capacity Tons/day (TPD)	Pros	Cons
Burial	On-Site	Potentially large (location dependent)	- Relatively rapid.	- Virus will remain viable in ground for some period. - Requires proper site and lining/capping to minimize environmental impacts. - Specific situation (e.g., frozen ground) may prevent/impede. - Equipment may not be available locally. - Owner/operator concerns regarding liability and other economic impacts. - Public perception.
Landfilling (Municipal Solid Waste)	Off-Site	Up to 1,000 TPD	- Sites constructed to minimize environmental impacts. - Relatively wide availability. - Pre-negotiated contracts possible.	- Virus will remain viable in landfill for some period. - Owner/operator concerns regarding liability and other economic impacts. - Public perception. - Potentially expensive. - Risk of viral spread during off-site transport.
Rendering	Off-Site	Up to 1,000 TPD	- Destroys virus. - Facilities likely to be near animal sites.	- Industry concern regarding liability and other economic impacts. - Displacement of normal business (non-AI material may need to be re-directed). - Risk of viral spread during off-site transport.
Incineration: Waste Incinerators	Off-Site	- 200 TPD: Municipal waste incinerators - 50 TPD: Hazardous waste incinerators - 20 TPD: Medical waste incinerators	- Destroys virus.	- Facility concerns regarding liability. - Public perception. - Permit considerations. - Potentially expensive. - Disinfection of unit exterior. - Risk of viral spread during off-site transport.

Appendix E - APHIS Directive 6800.1

United States Department of Agriculture
Marketing and Regulatory Programs
Animal and Plant Health Inspection Service

Directive

APHIS 6800.1

5/10/06

ENSURING THE PROTECTION OF EMPLOYEES INVOLVED IN HIGHLY PATHOGENIC AVIAN INFLUENZA CONTROL AND ERADICATION ACTIVITIES

1. PURPOSE

This Directive specifies APHIS policy to ensure the safety of employees engaged in highly pathogenic avian influenza (HPAI) control and eradication activities. The policy is based on the degree of risk known to be associated with various levels and types of exposures to HPAI viruses and should be considered complementary to avian disease control and eradication strategies as determined by State government, industry, or the United States Department of Agriculture (USDA).

2. AUTHORITIES

- a. Occupational Safety and Health Act of 1970, Section 5(a)(1), the General Duty Clause of the Act: "each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees."
- b. 29 Code of Federal Regulations (CFR) 1910.120, 1910.132, 1910.134, and 1910.1030, Occupational Safety and Health Administration (OSHA) General Industry Regulations.

3. BACKGROUND

Avian influenza (AI) is a contagious viral infection or disease of many avian species including poultry, wild and exotic birds, ratites, shorebirds, and migratory waterfowl. HPAI is seen primarily in poultry (rarely in other birds) and is characterized by severe depression, a decrease in egg production, high mortality, edema, hemorrhage, and necrosis. Birds that are infected with avian influenza virus can shed virus in saliva, nasal secretions, and feces. Contact with feces or respiratory secretions is important in the transmission of infection among poultry.

Avian influenza viruses may be defined as highly pathogenic based either on mortality rates in chickens following intravenous inoculations or on the amino acid sequence at the hemagglutinin cleavage site. Only those results confirmed as HPAI by the National Veterinary Services Laboratory (NVSL) in Ames, Iowa will be considered highly pathogenic.

Although HPAI viruses rarely infect humans, since 1997, instances of human infection have occurred outside the United States resulting in serious illness and even death. Transmission to humans is mainly thought to be caused by direct contact with infected poultry. The modality of transmission is not known, but could include virus entering a person's mouth, nose, eyes, or lungs via aerosolization and inhalation into the lungs, or by ingestion of contaminated material. Additionally, it is possible that infection could result from contact with virus-contaminated surfaces followed by self-inoculation of the virus in the eyes, nose, or mouth.

This Directive is based on what are currently deemed optimal precautions to protect individuals from infection and illness while they are involved in the response to an HPAI outbreak, and to guard against the subsequent risk of viral reassortment (i.e., mixing of genes from human and avian viruses) if a human does become infected.

Employees involved in HPAI control and eradication activities on known affected or potentially affected premises are at increased risk for exposure to the HPAI virus because those employees frequently have prolonged and direct contact with infected birds or contaminated surfaces in an enclosed setting.

4. POLICY

- a. APHIS employees involved in activities to control and eradicate any HPAI virus among poultry in the United States or abroad must read, understand, and follow Attachment 1 entitled: "APHIS Guidance for Protecting Workers Against Highly Pathogenic Avian Influenza." This document was adapted from the Occupational Safety and Health Administration (OSHA) publications "Guidance for Protecting Workers Against Avian Flu" (<http://www.osha.gov/dsg/guidance/avian-flu.html>) and "Avian Influenza—Protecting Poultry Workers at Risk" (<http://www.osha.gov/dts/shib/shib121304.html>).
- b. Employees also must review the Centers for Disease Control and Prevention's interim guidance documents regarding protection of employees involved in controlling and eradicating avian influenza in U.S. poultry. These guidance documents, "Interim Recommendations for Persons with Possible Exposure to Avian Influenza During Outbreaks Among Poultry in the United States" and "Interim Guidance for Protection of Persons Involved in U.S. Avian Influenza Outbreak Disease Control and Eradication Activities" are available online at <http://www.cdc.gov/flu/avian/professional/possible-exposure.htm> and <http://www.cdc.gov/flu/avian/professional/protect-guid.htm>, respectively.
- c. To mitigate the risk of exposure or infection, all employees involved in such activities must follow the precautions specified in Attachment 1. Among other topics, the Attachment includes recommendations about personal protective equipment, vaccination with the seasonal influenza vaccine, administration of

antiviral drugs for prophylaxis, surveillance and monitoring of workers, and evaluation of workers who develop a febrile respiratory illness within 7 days of their last exposure to infected birds or contaminated surfaces.

- d. All employees involved in an HPAI response must understand and comply with this Directive.
- e. Any required negotiations with appropriate bargaining unit exclusive representatives will be conducted.

5. INQUIRIES

- a. Questions about this Directive or the specific instructions detailed in Attachment 1 should be directed to the Safety, Health, and Employee Wellness Branch (SHEWB), Employee Services Division, Marketing and Regulatory Programs Business Services. SHEWB can be reached during regular business hours Monday-Friday (8 AM to 5 PM Eastern Time) at 301-734-6116.
- b. This Directive is available on the Internet at www.aphis.usda.gov/library

/s/

Wm. R. DeHaven
Administrator

Attachment

Attachment 1
APHIS Directive 6800.1
5/10/06

**ANIMAL AND PLANT HEALTH INSPECTION SERVICE
GUIDANCE FOR PROTECTING WORKERS AGAINST HIGHLY PATHOGENIC
AVIAN INFLUENZA**

GUIDANCE FOR PROTECTING POULTRY WORKERS AT RISK

Highly pathogenic avian influenza (HPAI) is a highly contagious disease of poultry. Despite the uncertainties, poultry experts agree that immediate culling of infected and exposed birds is the first line of defense to both reduce further losses in the agricultural sector and to protect human health. However, culling must be carried out in a way that protects workers from exposures to highly pathogenic avian influenza viruses and therefore reduce the likelihood of infection, illness or viral reassortment.

Exposure to infected poultry, their feces, or respiratory secretions, or contact with potentially contaminated surfaces can result in transmission of the virus to humans. Human infection with avian influenza, however, is a rare occurrence. Although there is evidence of limited person-to-person spread of the HPAI virus infection, sustained and efficient human-to-human transmission has not been identified.

The following summarizes recommendations for protecting at-risk workers developed by the Centers for Disease Control and Prevention (CDC), the World Health Organization, and the Occupational Safety and Health Administration. Employees involved in HPAI control and eradication activities must take these precautions.

1. All persons who have been in contact with poultry, their feces or respiratory secretions, or contact with potentially contaminated surfaces must wash their hands frequently. Hand hygiene also must be performed immediately after gloves are removed and must consist of washing with soap and water for at least 15-20 seconds or using other standard hand-disinfection procedures as specified by State government, industry, or United States Department of Agriculture (USDA) outbreak-response guidelines.
2. All workers involved in the culling, transport, or disposal of HPAI virus-infected poultry must not eat, drink, or smoke while performing these duties and must be provided with the following appropriate personal protective equipment:
 - a. Protective clothing capable of being disinfected or discarded, preferably coveralls (plus an impermeable apron) or surgical gowns with long cuffed sleeves (plus an impermeable apron).
 - b. Gloves capable of being disinfected or discarded; gloves must be carefully removed and discarded or disinfected and hands should be thoroughly washed when possible or disinfected using an alcohol-based handcleaner or 10% bleach/water solution. Gloves should be changed if torn or otherwise damaged.

- c. Respirators: the minimum recommendation is a disposable particulate respirator (e.g., N95, N99 or N100) used as part of a comprehensive respiratory protection program. The elements of such a program are described in 29 CFR 1910.134. At a minimum, workers will be medically cleared and fit tested for the model and size respirator they wear and be trained to fitcheck the seal of the facepiece to the face. An N95 or higher respirator that is fluid resistant should be considered for workers who have a high risk of exposure to splashes or fluids.
 - d. Eye protection (e.g., goggles).
 - e. Boots or protective foot covers that can be disinfected or discarded.
3. Environmental clean-up must be carried out in areas of culling, using the same protective measures as in items 1. and 2., above.
 4. 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. Influenza vaccine recipients should be advised that the seasonal influenza vaccine does not protect against avian influenza viruses. This vaccine will be made available at no cost to the worker.
 5. Workers also are highly encouraged to receive an influenza antiviral drug daily (that is approved for use as prophylaxis), for the duration of time during which direct contact with poultry, their secretions, or contact with contaminated surfaces occurs and continuing 5-7 days after the last day of potential virus exposure. Antivirals must be administered in combination with inactivated influenza vaccine (as mentioned above). The choice of antiviral drug should be based on sensitivity testing when possible. In the absence of sensitivity testing, a neuraminidase inhibitor (e.g., oseltamivir) is the first drug of choice since the likelihood is smaller that the virus will be resistant to this class of antiviral drugs than to amantadine or rimantidine.
 6. Potentially exposed workers must monitor their health for the development of fever, respiratory symptoms, and/or conjunctivitis (i.e., eye infections) for 1 week after last exposure to HPAI virus-infected or exposed birds or to potentially contaminated environmental surfaces. Individuals who become ill must seek prompt medical care and give notification prior to arrival at the health care provider's office or clinic that they may have been exposed to an HPAI virus.
 7. It is important to take measures to prevent the virus from being spread to other areas. To do this, disposable items of personal protective equipment must be discarded properly, and non-disposable items must be cleaned and disinfected according to outbreak-response guidelines.
 8. To prevent the possible risk of transmission of an HPAI virus to their contacts, especially household members, ill persons must practice good respiratory and hand hygiene to lower the risk of transmission of the virus to others. For more information, visit CDC's "Cover Your Cough" website: www.cdc.gov/flu/protect/covercough.htm

9. Patients or health care providers who wish to report possible human cases of zoonotic transmission of highly pathogenic avian influenza must consult with their local or State Department of Health.

GUIDANCE FOR WILDLIFE BIOLOGISTS

1. Wildlife Biologists handling **healthy** wild birds should:
 - a. Work in a well-ventilated area if working indoors.
 - b. Work upwind of animals, to the extent practicable, to decrease the risk of inhaling aerosols such as dust, feathers, or dander when working outdoors.
 - c. Wear rubber or latex gloves that can be disinfected or disposed of.
 - d. Wear protective eyewear or a face shield while handling animals.
 - e. Wash hands with soap and water often and disinfect work surfaces and equipment between sites. If soap and water are not available, alcohol-based handcleaner or 10% bleach/water solution will be used.
 - f. Not eat, drink, or smoke while handling animals.
2. Wildlife Biologists handling **sick or dead** birds should:
 - a. Follow the recommendations above, and, at a minimum, wear protective clothing, including coveralls, rubber boots, and latex or rubber gloves that can be disinfected or disposed of.
 - b. Minimize exposure to mucosal membranes by wearing protective eyewear (goggles) and a particulate respirator (NIOSH N95 respirator at a minimum).
 - c. Decontaminate and properly dispose of potentially infectious material including carcasses.
 - d. Not eat, drink, or smoke while handling animals.
3. HPAI Response in Wild Birds. Wildlife Biologists working with wildlife in an area where HPAI H5N1 is suspected or has been detected must comply with this Directive by:
 - a. Following the recommendations above and the basic guidelines for infection control, including how to put on and use, remove, disinfect, or dispose of personal protective equipment and clothing.

- b. Washing hands with soap and water frequently and disinfecting exposed surfaces and field equipment between work sites. If soap and water are not available, alcohol-based handcleaner or 10% bleach/water solution will be used.
- c. Not eating, drinking, or smoking while handling animals.
- d. Wearing coveralls, gloves, shoe covers, or boots that can be disinfected or discarded, a respirator (NIOSH N95 respirator at a minimum protective), and eyewear (goggles).
- e. Monitoring their health for clinical signs of influenza infection, such as fever, cough or sore throat, trouble breathing, or eye inflammation, during and for one week after, their last exposure to potentially HPAI virus-infected or exposed birds.
- f. Contacting their healthcare provider if they develop fever, flu-like symptoms, or conjunctivitis (eye inflammation). Inform the provider prior to arrival that they have potentially been exposed to HPAI.

Additional information about HPAI H5N1 can be found at the following web link:
USGA National Wildlife Health Center:
http://www.nwhc.usgs.gov/disease_information/avian_influenza/index.jsp

GUIDANCE FOR VETERINARY LABORATORY WORKERS

Highly pathogenic avian influenza A viruses are classified as “select agents” and must be handled under Biosafety Level (BSL) 3 enhanced or BSL 3-Agriculture laboratory standards. These include controlled access, double door entry with change room and shower out, use of respirators when working with specimens outside a biological safety cabinet, and decontamination of all waste. Laboratories working on these viruses must be USDA-approved.

Clinical specimens from suspect HPAI virus cases may be tested by polymerase chain reaction (PCR) assays using standard BSL 2 work practices in a Class II biological safety cabinet. In addition, commercial antigen detection testing can be conducted under BSL 2 levels to test for influenza viruses.

All employers processing biologic specimens suspected of being infected with the HPAI virus must ensure that their employees comply with all provisions of 29 CFR 1910.1030 for employee protection against bloodborne pathogens, including the reporting of accidental exposure to avian influenza virus. Any accidental exposure must be reported to an immediate supervisor or employee health department.

Additional Sources of Information on Avian Influenza

Centers for Disease Control and Prevention, <http://www.cdc.gov/flu/avian/index.htm>

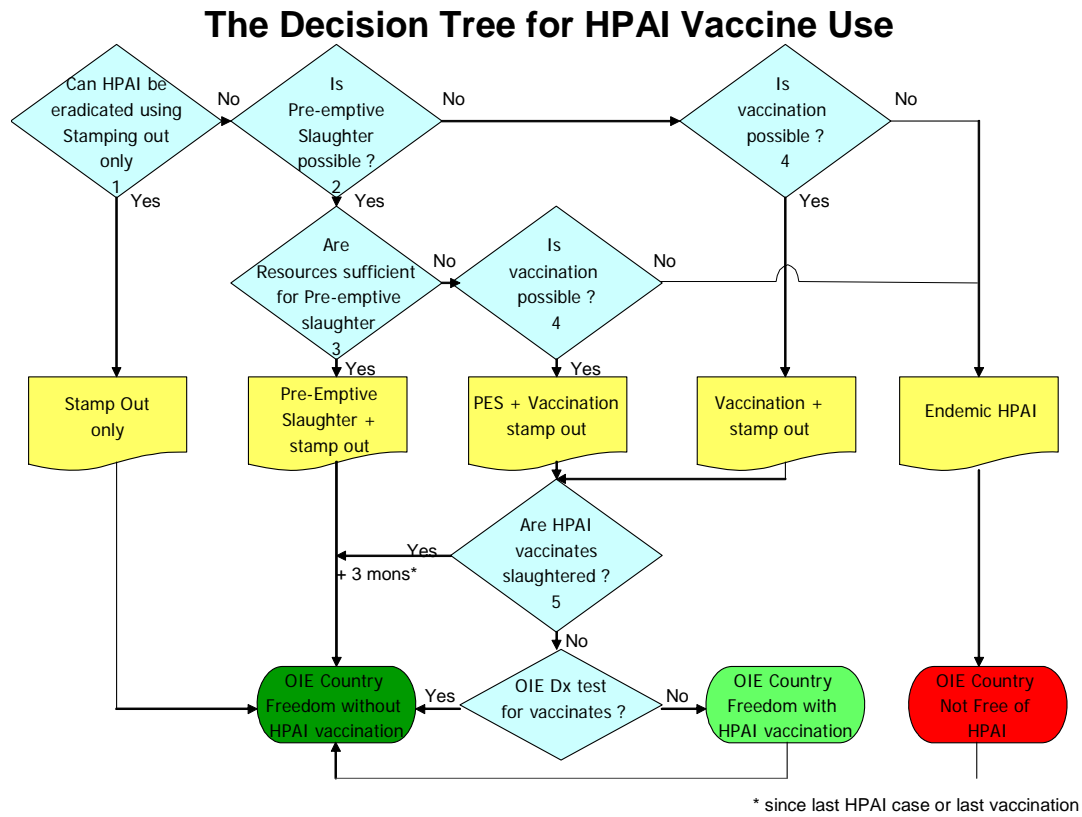
U.S. Department of Agriculture, Animal and Plant Health Inspection Service, http://www.aphis.usda.gov/lpa/issues/ai_us/ai_us.html

World Health Organization, "Avian Influenza – Fact Sheet" http://www.who.int/csr/disease/avian_influenza/en/

World Health Organization, "Avian Influenza Frequently Asked Questions" http://www.who.int/csr/disease/avian_influenza/avian_faqs/en/

APHIS Medical Surveillance Service Form 29 and How to Complete <http://www.aphis.usda.gov/mrpbs/forms/aphisforms.html>

Appendix F - Decision Tree for HPAI Vaccine Use



Appendix G - Appraisal Methods

Fair market value is most effectively determined when a sale occurs between a knowledgeable and willing buyer and seller. Obviously, the destruction of an owner's birds/livestock is not a sale between a willing buyer and seller, so fair market value must be estimated. An appraisal is an estimate of what an animal is worth or the price it would have received if it had been sold. Special consideration may be needed to establish the fair market value of species of birds/livestock of valuable genetic stock.

The **sales comparison approach** is a method for determining value where the appraiser uses information from recent sales of comparable properties to form an opinion of the value of the subject property (the animal being appraised). Ideally, comparable properties match with the subject property in major characteristics; however, this may not always be the case. When there are some differences in major characteristics, the appraiser must make adjustments to the values of the comparable properties to estimate the value of the subject property. When using the sales comparison approach, it is important to base the estimated sale price on what the owner would receive for his or her birds/livestock at the farm.

Sometimes, only retail prices are observed (as is the usual case with pet birds or pet fish). However, the sales comparison approach method is not an effective method for estimating fair market value when market prices are not observable or reflective of true value due to the low number of birds/livestock traded. When the sales comparison approach method cannot be used, two other appraisal methods are available: the cost-of-production approach and the income approach. Both approaches require detailed knowledge of production costs.

The **cost-of-production approach** assumes that an asset should have worth at least equal to the cost to produce it. The cost-of-production approach can also be used to estimate value of breeding stock to the point of sexual reproduction; e.g., egg laying in poultry and piglets in swine.

The **income approach** is an appraisal approach that incorporates the value of future production into the value of the asset (birds/livestock). Asset value is a function of both revenues and costs associated to produce the revenues. Since the income approach incorporates future production, there is no payment of additional indemnity for lost egg production.

Appendix H - List of Acronyms

AERO	Animal Emergency Response Organization
AHPA	Animal Health Protection Act
AI	avian influenza
APHIS	Animal and Plant Health Inspection Service
AZA	American Zoological Association
ct	cycle threshold
CVB	Center for Veterinary Biologics
DHS	Department of Homeland Security
DIVA	differentiation of infected from vaccinated animal
DOI	Department of Interior
EMRS	Emergency Management Response System
EPA	Environmental Protection Agency
ESF	Emergency Support Function
FADD	foreign animal disease diagnostician
FSA	Farm Service Agency
HHS	Department of Health and Human Services
HPAI	highly pathogenic avian influenza
HPNAI	highly pathogenic notifiable avian influenza
ICAT	Incident Complexity Analysis Team
ICP	Incident Command Post
ICS	Incident Command System
ICT	incident command team
IVPI	intravenous pathogenicity index
JIC	Joint Information Center
LBMS	live bird marketing system
LPAI	low pathogenic avian influenza
LPNAI	low pathogenicity notifiable avian influenza
NAADSM	North American Animal Disease Spread Model
NAHEMS	National Animal Health Emergency Management System
NAHLN	National Animal Health Laboratory Network
NAI	notifiable avian influenza
NCIE	National Center for Import Export
NIMS	National Incident Management System
NPIP	National Poultry Improvement Plan
NVS	National Veterinary Stockpile
NVSL	National Veterinary Services Laboratories
OC	Office of Communications
OIE	World Organization for Animal Health
PI	post infection
PPE	personal protective equipment
PSA	public service announcement
Q&A	questions and answers
RRT-PCR	real-time reverse transcriptase polymerase chain reaction

SITC	Smuggling Interdiction and Trade Compliance Agency
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
VI	virus isolation
VS	Veterinary Services
9 CFR	Title 9, <i>Code of Federal Regulations</i>

Appendix I - References

Capua, I., The Use of Vaccination As An Option For The Control of Avian Influenza, Proceedings of 71st General Session, International Committee, World Organisation for Animal Health (OIE); May 2003.

NAHEMS Guidelines: “Quarantine and Movement Control.”

NAHEMS Guidelines: “Vaccination for Contagious Disease.”

OIE Terrestrial Code Chapter on Avian Influenza Chapter 2.7.12.1, 2006.

Title 9, *Code of Federal Regulations* (9 CFR), part 53.

USDA-APHIS-VS-NCAHP- Use of Vaccines in Low Pathogenic H5/H7 Avian Influenza outbreak situations – Activation of the USDA vaccine bank 2006.

USDA-APHIS-VS National Veterinary Stockpile Countermeasures Working Group Report on Avian Influenza, 2005.

USDA-APHIS-VS Standard Operating Procedures Highly Pathogenic Avian Influenza, Draft.

USDA-APHIS-Wildlife Services, DOI, HHS, Interagency Strategic Plan for the Early Detection System for Asian H5N1 HPAI in Wild Migratory Birds, 2005.

USDA National Veterinary Stockpile, A Guide to Federal, State, and Local Authorities, Draft, July 20, 2006.

VS Memorandum No. 580.4, “Procedures for Investigating a Suspected Foreign Animal Disease/Emerging Disease Incident (FAD/EDI)” March 30, 2004.

VS Memorandum No. 800.85, “Avian Influenza Vaccines” May 18, 2005.