

# North Carolina Response and Containment Plan for Highly Pathogenic and Low Pathogenic Avian Influenza



**North Carolina Department of Agriculture  
And Consumer Services**

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## **I. Introduction**

### **A. AI in Birds**

Avian influenza (AI) is a highly transmissible viral disease of poultry. The RNA virus also infects other birds, primarily waterfowl and shorebirds. Disease produced by AI viruses may vary from asymptomatic to respiratory disease and egg production drops to severe systemic disease with up to 100% mortality. Waterfowl and shorebirds are usually asymptomatic carriers of the avian influenza virus; however some species can experience severe mortality with certain strains of the virus, such as Asian H5N1 virus. AI viruses that cause asymptomatic infections or low mortality are referred to as mildly or low pathogenic avian influenza (LPAI) viruses, while the more virulent viruses are referred to as highly pathogenic or HPAI viruses. The LPAI virus subtypes H5 and H7 are of concern because of their demonstrated ability to mutate or exchange genetic material and become a HPAI. Early control and elimination of any H5 or H7 viruses is essential, because when allowed to replicate in a large number of birds, the potential for genetic changes leading to HPAI dramatically increases. In addition, while LPAI are not usually considered to be zoonotic, worldwide there have been few reported cases of human infection with LPAI subtype H9 and H7. There is a greater concern of human infection with HPAI viruses. See **Appendix A** for further information on Avian Influenza.

### **B. AI in Humans**

AI viruses mainly infect birds; however, human cases of avian influenza have been documented since 1996. All human cases of AI have resulted from one of three influenza A subtypes: H5, H7 and H9. Human disease with AI has a wide range of manifestations. Individuals infected with low pathogenic avian influenza (LPAI) generally have mild symptoms, such as conjunctivitis (an inflammation of the lining of the eye), or mild influenza-like illness with fever, muscle aches and respiratory symptoms. Individuals infected with highly pathogenic avian influenza virus (HPAI) may exhibit severe respiratory disease such as acute respiratory distress syndrome (ARDS) which can be fatal. The current outbreak of the Asian-type H5N1 virus has demonstrated a case-fatality rate of approximately 60%. Low pathogenic AI virus infection in poultry appears to be much less likely to cause illness in humans than highly pathogenic AI virus. Most human infections with avian influenza viruses have been attributed to direct contact with infected poultry.

Human infection with AI viruses can cause significant morbidity and mortality; however, of greater concern to public health is the potential for the emergence of a new human influenza A H5N1 viral

strain that successfully adapts to the human population with the ability to be easily transmitted between people. The spread of avian influenza A viruses from one ill person to another has been reported very rarely, and has been limited, inefficient and unsustainable. However, because avian influenza A viruses have the potential to change and gain the ability to spread easily between people, monitoring for human infection and person-to-person transmission is important.

## C. AI Response Plan Development

Avian influenza has the potential to result in significant economic losses for the poultry industry of NC. In an effort to limit the potentially devastating effects of avian influenza, the **H5 and H7 Low Pathogenic Avian Influenza Response Plan for North Carolina** (LPAI Response Plan) for the control and eradication of avian influenza was developed. That plan addressed subtypes H5 and H7 LPAI, due to their potential to develop into HPAI.

Response to highly pathogenic avian influenza HPAI, if diagnosed in NC, will be handled as a foreign animal disease. This update of the HPAI plan will include specifics of response to both HPAI and LPAI. We believe that a single concise plan will most benefit those responding, since in the beginning of an outbreak it may not be clear whether the infectious agent is HPAI or LPAI. The new plan will be titled **North Carolina Response and Containment Plan for Highly Pathogenic and Low Pathogenic Avian Influenza**. It includes details of response to AI in commercial and non-commercial small flocks. The North Carolina AI Response Plan has been developed by a working group consisting of representatives from the poultry industry, the NC Department of Agriculture and Consumer Services (NCDA&CS), the North Carolina State University College of Veterinary Medicine, the NC Division of Public Health and the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS).

Approval and revision of this plan will be the responsibility of the NCDA&CS Poultry Disease Advisory Committee. The committee is appointed by the NC Commissioner of Agriculture. Its members include representatives from all segments of the poultry industry, NCDA&CS, USDA-APHIS, and NC State University. The committee will meet annually to review the plan, and at other times as dictated by health concerns in the poultry industry. A list of the NCDA&CS Poultry Disease Advisory Committee members is found in **Appendix B**.

## II. Diagnostic Resources

The NCDA&CS provides surveillance, diagnostic, and regulatory testing services for influenzas of all animal species through its multi-facility North Carolina Veterinary Diagnostic Laboratory System (NCVDLS). This five laboratory system is anchored by the Rollins Disease Diagnostic Laboratory in Raleigh, NC. The Rollins facility is an original participating satellite member of the National Animal Health Laboratory Network (NAHLN), thus benefiting from and contributing to a national, regional, and state influenza testing platform through oversight from the USDA-APHIS National Veterinary Services Laboratory (NVSL).

Routine surveillance, as well as initial and surge response testing of samples by agar gel immunodiffusion (AGID), Enzyme Linked Immunoassay (ELISA) and Antigen Capture Immunoassays (ACIA) such as Flu Detect and the Binax test are conducted by most of the branch lab facilities as well as by Rollins laboratory. Other antigen detection tests including virus isolation and real-time reverse-transcriptase (RRT)-PCR, are centered at Rollins Lab. In addition, Rollins Laboratory has constructed a Biosafety level 2+ laboratory area that can adequately handle high-risk AI samples from the field and the increased number of tests expected in response to an AI outbreak.

NCVDLS facilities providing avian influenza testing and diagnostic services are listed below:

1. Rollins Disease Diagnostic Laboratory (AGID, ELISA, ACIA, VI, Real Time-PCR, necropsy/pathology)  
1031 Mail Service Center  
Raleigh, NC 27699-1031  
2101 Blue Ridge Road  
Raleigh NC 27607  
(919) 733-3986
2. Hoyle C. Griffin Diagnostic Laboratory (AGID, ELISA, ACIA, necropsy/pathology)  
PO Box 2183, 401 Quarry Road  
Monroe, NC 28110  
(704) 289-6448
3. Rose Hill Diagnostic Laboratory (AGID, ELISA, ACIA, necropsy/pathology)  
PO Box 37, 329 Yellow Cut Road  
Rose Hill, NC 28458  
(910) 289-2635
4. Northwestern Diagnostic Laboratory (AGID, ELISA, ACIA, necropsy/pathology)  
PO Box 70, 1689 North Bridge Street

Elkin, NC 28621  
(336) 526-2499

5. Arden Laboratory (necropsy/pathology)

PO Box 279, 785 Airport Road  
Fletcher, NC 28732  
(828) 684-8188; Fax: (828) 687-3574

System-wide annual laboratory testing capacities would be in the following approximate range:

<u>Test</u>	<u>Routine</u>	<u>Surge</u>	
AGID	130,000	260,000	
Virus Isolation	500	5,000	Incubator capacity limiting factor
RRT-PCR	2,000	125,000	Reagent, personnel, facilities, and funds Dependent
ELISA	100,000	Variable, dependent on funding and test kit availability	
ACIA	20,000	Variable, dependent on funding and test kit availability	

**Laboratory Communication**

The NCVDLS system and Poultry Programs are within the Veterinary Division of NCDA&CS. Laboratory officials and the Director of Poultry Programs are under the supervisory oversight of the State Veterinarian (SV). Communication between the SV, laboratory officials, the Director of Poultry Health Programs and NCDA&CS Emergency Programs staff, is ongoing during an incident through telephone conversation, e-mail, and on-site visits. Communication with the NVSL and USDA-APHIS-VS offices in Raleigh, NC and Riverdale, Maryland is achieved similarly. The division Director of Poultry Health Programs utilizes a list serve of key poultry industry contacts in addition to the members of the Poultry Disease Advisory Committee to disseminate critical laboratory and response updates. The Laboratory also communicates to other NAHLN laboratories and the NVSL through the NAHLN specific intranet site.

The USDA’s NVSL is utilized for support and confirmatory functions. Samples are shipped via Federal Express overnight delivery. The NCVDLS has an ongoing professional association between state virologists and appropriate NVSL subject matter experts, as well those professionals at the Poultry Diagnostic and Research Center in Athens, Ga., NCSU College of Veterinary Medicine, and

poultry industry veterinarians. NVSL services include viral subtyping with conventional reference antisera in the hemagglutination-inhibition (HI) and neuraminidase-inhibition (NI) tests; confirmatory viral isolation and patho-typing if needed; and phylogenetic molecular characterization of isolates

### **III. Personnel Resources**

#### **A. Veterinary Division**

The NCDA&CS Veterinary Division is led by the State Veterinarian, who has responsibility for providing leadership during an AI outbreak through the Incident Command System. The Division is approximately 161 strong, with 29 Veterinarians, 32 field staff, 70 laboratory technicians and approximately 31 administrative personnel available for service during an outbreak. The Veterinary and Field staff are trained in the Incident Command System, Biosecurity and field sampling techniques.

#### **B. Emergency Programs Division**

The NCDA&CS has an Emergency Programs (EP) Division responsible for providing incident management leadership in the event of any emergency within the state involving agriculture. This division is 24 strong, with a Director, Project Manager, and a team of 7 veterinarians, 3 Emergency Specialists, 5 ISS personnel and 8 administrative staff. EP Division staff train with State Emergency Management and Public Health Personnel to be First Responders. In the event of an animal emergency in NC, the Veterinary Division would provide direction and technical expertise as directed by the SV, while the EP Division would provide the logistical incident management. The EP Division continues to work with the poultry industry, NC Division of Public Health, and Emergency Management on the issues of euthanasia and disposal, as well as HPAI, LPAI and zoonotic influenza response exercises, including associated human and animal health issues.

## C. NC Division of Public Health-

The Epidemiology Section of the NC Division of Public Health will provide support to NCDA&CS and to the Local Health Department in the event of an AI outbreak. Located in the Epidemiology Section are the State Epidemiologist and the State Public Health Veterinarian, providing valuable resources for human health and the human-animal health interface. Monitoring and surveillance of field personnel with potential exposure to HPAI or LPAI will be supported through the Communicable Disease Branch. Provision of antiviral medications when warranted and support for the generation and distribution of guidelines regarding the use of these medications will be made through Public Health Preparedness and Response (PHP&R). Public health messages will be developed in coordination with the Local Health Director with support by PHP&R. PHP&R also coordinates the seven Public Health Regional Surveillance Teams (PHRSTs) which can provide Incident Management Teams, Epidemiologic support, and environmental health risk information. Members of PHP&R and the PHRSTs have been trained in emergency response such as that required in an AI outbreak.

## D. Other Personnel Resources

In addition to the aforementioned response staff, the Meat and Poultry Division of NCDA&CS has individuals, including veterinarians and other skilled personnel that could be made available in response to an AI outbreak. The NCSU-College of Veterinary Medicine also has offered their expertise and manpower in the area of epidemiology and field response, if needed for AI response. Another state agency, the Department of Environment and Natural Resources, Air and Water Quality, and Waste Management would be valuable advisors in time of AI response, especially in the area of safe carcass disposal of depopulated birds.

## E. Partner Responsibilities

Partners and their responsibilities in any response to AI in NC include the following:

### 1. NCDA&CS—Veterinary Division and Emergency Programs

- Leadership of ICS
- Preliminary diagnosis of AI through NCVDLs
- Communication with NCVDLs, USDA APHIS, NVSL, Industry partners, Public Health, other states and the Public

- Request services and support from USDA APHIS-Bird payment, depopulation costs, cleaning and disinfection costs, disposal cost and additional surveillance costs
- Coordinate interagency support, logistics for field response
- Provide Strike Team training for own and industry personnel
- Encourage and provide seasonal flu vaccine for personnel
- Provide needed surge capacity for increased AI testing
- Field services
  - a. Non-Commercial surveillance, depopulation and disposal
  - b. Resource for Depopulation and other response equipment
  - c. Supervision of Depopulation
  - d. Assist in field surveillance
  - e. Resource for trained personnel
  - f. Place quarantines on suspect premises
  - g. Inspect following Cleaning and Disinfection and release quarantine

## **2. USDA APHIS—AVIC and Staff**

- Confirm AI diagnosis through NVSL
- Make initial national announcement of AI infection
- Act as liaison between interested parties: contractors, other states
- Determine when depopulation may take place with indemnity guaranteed
- Initiate Indemnity procedures-coordinate appraisal of flock/s
- Assist in ICS system—may have leadership role, help to staff ICS structure
- Epidemiology support
- Approve or disapprove vaccination if requested
- Negotiate with and approve contractors to help with response if needed
- Resource for equipment and PPE supplies through National Veterinary Stockpile
- Provide trained personnel to assist in field response
- Coordinate communication between NCDA&CS and Region and/or Riverdale

## **3. Commercial Poultry Industry**

- Maintain groups of trained staff for depopulation or surveillance strike teams
- Provide personnel to staff ICS structure

- Create and maintain biosecurity standards for company operations
- For each premise, have depopulation and disposal plan
- Pre-contract for equipment operators for disposal
- Create and maintain company disease response plan
- Obtain and stockpile some PPE for company personnel
- Obtain and stockpile sufficient Disinfectants for several premises response
- Form a plan for obtaining antiviral medication for company personnel who might be exposed to active AI infection
- Be prepared to provide accurate age, mortality records, and estimated worth of any flocks that becomes infected
- Encourage and offer seasonal flu vaccine to employees
- Pre-identify carbon sources for in-house composting
- Have on hand stockpile of surveillance supplies: swabs (large and small), tubes, media, syringes, needles
- Provide sprayers for on-farm vehicle decontamination if farm not equipped
- Have in place a safety plan for company responders
- Have on hand a list of employees qualified to take part in a response
- Obtain barrel for each farm with plastic bags stockpile for fresh dead surveillance

#### **4. NC Division of Public Health**

- Have in place an MOU agreement with NCDA&CS to provide a stockpile of antiviral medications for emergency response personnel
- Assist the Local Health Director in:
  - Developing a case definition and case investigation of potentially exposed individuals
  - Monitoring worker health on infected premises
  - The investigation and monitoring of the health of exposed poultry growers and families
  - Maintaining and compiling records on health of workers during an outbreak.
  - Providing guidelines regarding the use of antiviral medications including indications for use and safety of use
  - Developing and coordinating health related messages to the community at large

- Enacting authorities for individual quarantine and community containment as necessary
- Providing ,as requested, expertise and assistance in monitoring responders working in PPE
- Maintain the preparedness of PHRST Teams to assist during an outbreak by providing training.
- Activate the Public Health Coordination Center for providing and coordinating resources including the PHRSTs
- Supply staff to the State EOC as requested
- Provide laboratory testing of human clinical samples as requested and coordinate with the Laboratory Response Network for other resources
- Maintain reports of cases of novel influenza virus infection as a NC Reportable Disease and exchange this information with NCDA&CS

#### **5. NCSU—CVM, NCDENR, NC Emergency Management, DOT and others**

- Provide a group of trained personnel to assist in field and on infected premises
- Offer expertise and assistance in trace-backs from infected premise if available
- Offer expertise in determination of adequate disposal sites
- Provide general educational information for the public via website and publications

## **IV. Routine AI Surveillance of NC Poultry**

A routine surveillance program for AI has been in effect in NC since 1985. The NC surveillance plan includes testing of four compartments of poultry and other birds:

- Poultry participating in the National Poultry Improvement Plan (NPIP) of USDA APHIS, including commercial and non-commercial flocks and upland game bird flocks
- Poultry participating in the LPAI surveillance program of the Live Bird Market System
- Backyard Poultry, including privately owned flocks used for meat, eggs and exhibitions
- Migratory Waterfowl and Shorebirds

Details of protocols for each compartment of poultry in the above programs are included in **Appendix C.**

In addition to the above surveillance the NCVDL system tests as follows:

- All serum samples tested for AI when requested by the submitter.
- All birds submitted to the NCVCLS that show signs compatible with AI, including egg drop, respiratory signs or high mortality are tested with both a serological test and an antigen detection test for AI.
- rRT-PCR for AI is performed on all bird samples submitted to the lab where a respiratory virus is suspected.

## **V. General Response Strategy to HPAI or LPAI in NC**

**The basis of HPAI and LPAI control in NC will be:**

- Rapid diagnosis and reporting
- Swift imposition of effective quarantine
- Prevention of movement of known or suspect contaminated materials
- Depopulation of infected birds if agreed upon by State, Industry and USDA APHIS officials
- Increased surveillance of surrounding flocks, both commercial and non-commercial

**Control may include:**

- Pre-emptive culling
- Vaccination
- Controlled marketing may be considered in the case of LPAI infection (see **Appendix X**)

**Once an infected premise is identified, the strategies selected will be determined by the SV. Containment of HPAI or LPAI in NC will require the use of several strategies depending on:**

- Number of farms infected
- Stage of the outbreak
- Epidemiological factors determining spread of virus
- Animal density in the area involved
- Availability of resources

**Incident Command Structure (ICS) will be adopted as a means to best address the response and work with partners in Emergency Management and Public Health. See (Appendices V and W).** Following ICS nomenclature will allow for all partners to communicate effectively. The State Veterinarian or his designee will act as the Incident Commander. Strike teams will be trained by NCDA&CS and commercial companies, in advance, for both depopulation of birds and for barrel surveillance.

## **A. NC Response Protocol-Wild Bird H5/H7 positive**

In order to emphasize the compartmentalization of the poultry grown in NC, and the production methods that provide protection for all commercial poultry, widespread testing in zones surrounding any wild bird H5 or H7 AI positive found will be at the discretion of the State Veterinarian.

Depending on the nature of the population of domestic poultry in close proximity to a wild bird with an AI positive test, the SV may choose to establish zones similar to those established in response to a domestic poultry positive AI test. Within the zones (control zone and buffer-surveillance zone), all commercial and non-commercial flocks would be tested within the first 48 hours following the wild bird H5 or H7 positive test to establish the AI status of domestic poultry in the area. Due to the likelihood that a wild bird found AI positive has not been a permanent resident of the area in which it was captured, further testing of domestic poultry would again be at the discretion of the State Veterinarian. The following is a possible sample protocol:

1. Confirm H5 or H7 positive test result in wild bird
2. Notify stakeholders according to protocol in **Section VI. E.**
3. Establish control and buffer-surveillance zones at appropriate mileage from location of wild bird. Place a state Quarantine if deemed necessary by the State Veterinarian.
4. Search NCDA&CS database for commercial and non-commercial poultry in the two zones
5. Designate separate strike teams to sample the commercial poultry versus non-commercial poultry for AI using tracheal or Oropharyngeal swabs and rRT-PCR testing
6. Complete sampling within 48 hours of original H5 or H7 AI diagnosis if possible.
7. If testing is negative, further surveillance is at the discretion of the State Veterinarian.
8. If testing has H5 or H7 AI positive result, continue protocol as indicated in each Zone protocol below in **Section VI.**

## **B. NC Response Protocol-Domestic Commercial Bird H5/H7 positive**

The protocols for response to H5 or H7 diagnosis in domestic birds in NC will follow the Incident Command System method of response and will be under the direction of the SV or his designee. For details, consult **Section VI** below.

## **C. NC Response Protocol—Backyard or Non-Commercial Poultry H5/H7 positive**

The protocol for response to discovery of H5 or H7 in backyard (BY) poultry will be similar to that put into play for AI in commercial poultry, with the level of response related to several factors: 1) proximity of AI positive BY poultry to compartments of the commercial poultry industry, 2) history of movement of birds or products from the BY flock premise to other areas, and 3) initial testing of any birds traced to or from the AI positive BY premise. A possible sample protocol for response to H5/H7 in BY poultry follows:

1. Confirm H5 or H7 positive test result in BY bird
2. Notify stakeholders according to protocol in Section VI. D.
3. Establish control and buffer-surveillance zones at appropriate mileage from location of BY flock. Place a state Quarantine if deemed necessary by the State Veterinarian.
4. Search NCDA&CS database for commercial and non-commercial poultry in the two zones
5. Designate separate strike teams to sample the commercial poultry versus non-commercial poultry for AI using tracheal or Oropharyngeal swabs and rRT-PCR testing
6. Complete sampling within 48 hours of original H5 or H7 AI diagnosis if possible.
7. If testing is negative, further surveillance is at the discretion of the State Veterinarian.  
This testing may include pre-slaughter antigen detection testing in commercial flocks in the control and buffer-surveillance zones, within 72 hours of slaughter.
8. If testing has H5 or H7 AI positive result, continue protocol as indicated in each Zone protocol below in Section VI.

## **VI. Response to Avian Influenza—Protocols**

### **A. Response Introduction**

#### **Low Pathogenicity Avian Influenza subtypes not H5 or H7**

If a premise that has tested positive for Avian Influenza (AI) is found to have a low pathogenicity strain that is not H5 or H7, state quarantine may be released if the NC state veterinarian (SV) so chooses. However, the owner and/or company involved would then be responsible for maintaining an organizational quarantine with strict biosecurity. Facilities should be cleaned and disinfected following the marketing of the flock. The next placement of birds in the facility will be closely monitored for AI.

#### **Low Pathogenicity Avian Influenza subtypes: H5 or H7**

A flock will be defined as AI positive and fall within the guidelines of the existing NC AI plan when it includes at least 2 of the following criteria.

1. Clinical signs compatible LPAI
2. Antigen Capture Immunoassay positive
3. RRT-PCR positive
4. Serology (AGID with subtype H5 or H7 positive results)

This definition is subject to reasonable retesting and interpretation of all pertinent factors in each case as determined by the SV. Once confirmed LPAI H5 or H7 positive, the flock is quarantined or remains quarantined. USDA/APHIS/VS and the poultry industry are notified by the NCDA&CS. Any live birds remaining in the flock are to be depopulated within 24 hours if possible. The SV reserves the right to consider controlled marketing for LPAI positive farms. A Flock Plan will be developed between USDA, APHIS, VS and NCDA&CS with input from the Bird owner and grower/producer (see **Appendix Z** for template)

#### **Highly Pathogenic Avian Influenza**

Pathogenicity of a virus can be estimated based on flock mortality, however, definitive classification (according to OIE standards) requires either an intravenous pathogenicity index test in live chickens or H5/H7 isolates with molecular sequencing of the hemagglutinin cleavage site similar to HPAI strains. These tests would be performed at NVSL. The SV may classify a flock as positive for highly pathogenic avian influenza based on any of the criteria consistent with the OIE plus high flock mortality.

## B. Vaccination

The fundamental method by which eradication of AI may be achieved is isolation and depopulation of infected birds, followed by appropriate disposal. Under some circumstances it may be necessary to also use vaccination. All current vaccines contain the matrix protein, which means the AGID test would have no differential diagnostic value. Decisions on vaccine use would need to be made after consideration of the circumstances prevailing at the time of outbreak. Vaccination could be approved for use in specified flocks under strict control of the SV and USDA-APHIS.

### **The objectives of vaccination as part of an eradication campaign may be:**

- Reduction of virus production in large populations of poultry in which slaughter of nearby uninfected birds is delayed by shortage of resources or bird age.
- Provision of a barrier of immune birds (buffer zone) to assist in area containment.
- Protection of particularly valuable or genetically important populations of birds.
- Protection of human health by limiting the spread of virus in a zoonotic event.

If vaccination is to become part of an eradication strategy, it will be subject to the following conditions:

- The decision to request the use of vaccine in the state will rest with the SV with input from USDA-APHIS and the poultry industry.
- USDA-APHIS must approve the use of vaccine.
- Decisions on which flocks to vaccinate and when, will be made by the SV with input from USDA-APHIS and the poultry industry.

## C. Protection of Personnel Overview

Protection of personnel who might come into contact with AI-infected birds is important to the success of the response plan. The various groups of personnel involved in plan implementation who might be at risk for virus exposure are listed below. These individuals need to be targeted for protective measures:

- Poultry company employees who will participate in farm operation, depopulation or barrel surveillance operations

- Company contracted for response or large equipment operation (assist in depopulation, decontamination and disposal)
- Contract growers and their families who may have ongoing contact with infected birds
- Employees of agencies or organizations involved in any task bringing them into close contact with affected flocks or infected materials, for example NCDA&CS personnel, lab workers, USDA APHIS field workers, NCSU-CVM personnel, etc

A team of employees from each poultry company, equipment operators, response contractors and agency workers may be identified in advance, for incident response activities including but not limited to depopulation, disposal and decontamination. Response personnel must be educated, have hands-on training, and vaccinated for seasonal influenza in advance of an event. They need to be prepared to mobilize and receive antiviral therapy when the occasion arises. The intent of NCDA&CS is to establish in conjunction with industry a central listing of response individuals, organizations, and contractors with contact information and compensation rates where applicable.

For a complete discussion of appropriate protective measures for workers exposed to AI-infected poultry, please see **Appendix E**, "Protecting Poultry Workers from Avian Influenza." This information grew out of collaboration between DHHS (Department of Health and Human Services) and NIOSH to produce a Safety and Health Information bulletin (Publication 2008-113). For North Carolina AI response details, see below.

## 1. Personal Protective Equipment (PPE) Guidelines

- PPE will be required for any worker entering a suspect or infected premise.
- The work being performed by the worker will determine the level of PPE required.
- Final decisions regarding the required level of PPE for workers will be made by the Incident Commander or Taskforce leader with the advice of the Safety Officer and the NC Division of Public Health. The Incident Commander or Taskforce leader is also responsible for setting up work rotation schedules for sites with due consideration of heat-stress, fatigue and ergonomic considerations.
- All on-site work will involve wearing some level of protection including protective clothing, foot or shoe covers, hand protection and respiratory and eye protection.

- Response personnel must have received the seasonal flu vaccine.
- No one who is ill with a suspected viral infection or who has not been vaccinated for seasonal influenza may enter a poultry house, a response location or processing facility.

## 2. Antiviral Prophylaxis

- An appropriate course of prophylaxis with an antiviral, such as oseltamivir (Tamiflu), will be administered to emergency responders in contact or potentially in contact with infected poultry or carcasses to minimize the potential for infection with virus.
- The course of prophylaxis will begin on the first day of identified exposure and continue for 7 days after the last exposure to infected poultry.
- Antiviral medications will be provided in most cases by the NC Division of Public Health. When necessary, prescriptions will be provided to the responder by the employer-identified consulting physician or their personal physicians.

## 3. Recommended PPE

- a. **Light duty work**—barrel surveillance or other jobs not requiring strenuous physical activity, and not within an enclosed poultry house environment. Worker may enter poultry house in this level of protection for sampling following cleaning and disinfection.
  1. Body protection—Coveralls (disposable preferred) or outer garments covering arms and legs, also disposable head cover
  2. Foot Protection—Disposable protective shoe covers or waterproof boots (vinyl or rubber) that can be cleaned and disinfected
  3. Hand Protection—lightweight vinyl or nitrile disposable gloves with heavy duty nitrile or work gloves over them, depending on job being performed
  4. Eye protection—Safety goggles to protect eye mucous membranes
  5. Respiratory protection—NIOSH-approved disposable particulate respirators (N95, N99, or N100) at a minimum. These must be properly fitted, and do not work with facial hair. Fitted full or partial face masks with appropriate filter cartridges are effective, if fitted to the worker and available.

**b. Heavy Duty Work**—Depopulation, equipment operator, in-house composting, facility and equipment cleaning activities, and any work inside an enclosed infected poultry house, but not including chemical exposure such as disinfectants.

1. Body Protection-- Coveralls (disposable preferred) or outer garments covering arms and legs, impermeable if needed, also disposable head cover.
2. Foot Protection—Heavy duty disposable protective shoe covers or waterproof boots (vinyl or rubber) that can be cleaned and disinfected
3. Hand Protection—Heavy-duty vinyl or nitrile gloves that can be disinfected. Heavy abrasion-resistant gloves may be worn over nitrile or vinyl gloves to protect them, but must be disposable. If work is prolonged, worker may want to wear thin cotton glove liners under the vinyl or nitrile gloves to prevent irritation from prolonged wet skin.
4. Eye Protection—Must be a part of the respiratory protection, as goggles will not fully protect from airborne particles.
5. Respiratory protection—Properly fitted face mask with appropriate filter cartridges' attached if available. This will not work with facial hair. Most ideal would be hooded or helmeted powered air purifying respirator (PAPR) with appropriate filter cartridges.

**c. Heavy Duty Wet Work**—Cleaning and Disinfection, any work inside an enclosed infected poultry house or outside for equipment or facility decontamination, including power washing and chemical exposure such as disinfectants.

1. Body Protection—Impermeable Coveralls (disposable preferred) with hood and integral booties.
2. Foot Protection—Heavy duty disposable protective shoe covers or waterproof safety boots (vinyl or rubber with steel toe and shank) that can be cleaned and disinfected
3. Hand Protection—Heavy-duty vinyl or nitrile gloves that can be disinfected. Heavy disposable abrasion-resistant gloves may be worn over nitrile or vinyl gloves to protect them, but must be disposable. If work is prolonged, worker may

want to wear thin cotton glove liners under the vinyl or nitrile gloves to prevent irritation from prolonged wet skin.

4. Eye Protection—Must be a part of the respiratory protection, as goggles will not protect from airborne particles.
5. Respiratory protection—Properly fitted face mask with appropriate filter cartridges' attached if available. This will not work with facial hair. Most ideal would be hooded or helmeted powered air purifying respirator (PAPR) with appropriate filter cartridges.

#### 4. Proper Removal of PPE and Exit from an Infected Premise

The purpose of PPE disposal and proper decontamination of workers is two-fold:

- 1) To prevent spread of infection from the infected premise
- 2) To minimize exposure of worker to LPAI or HPAI

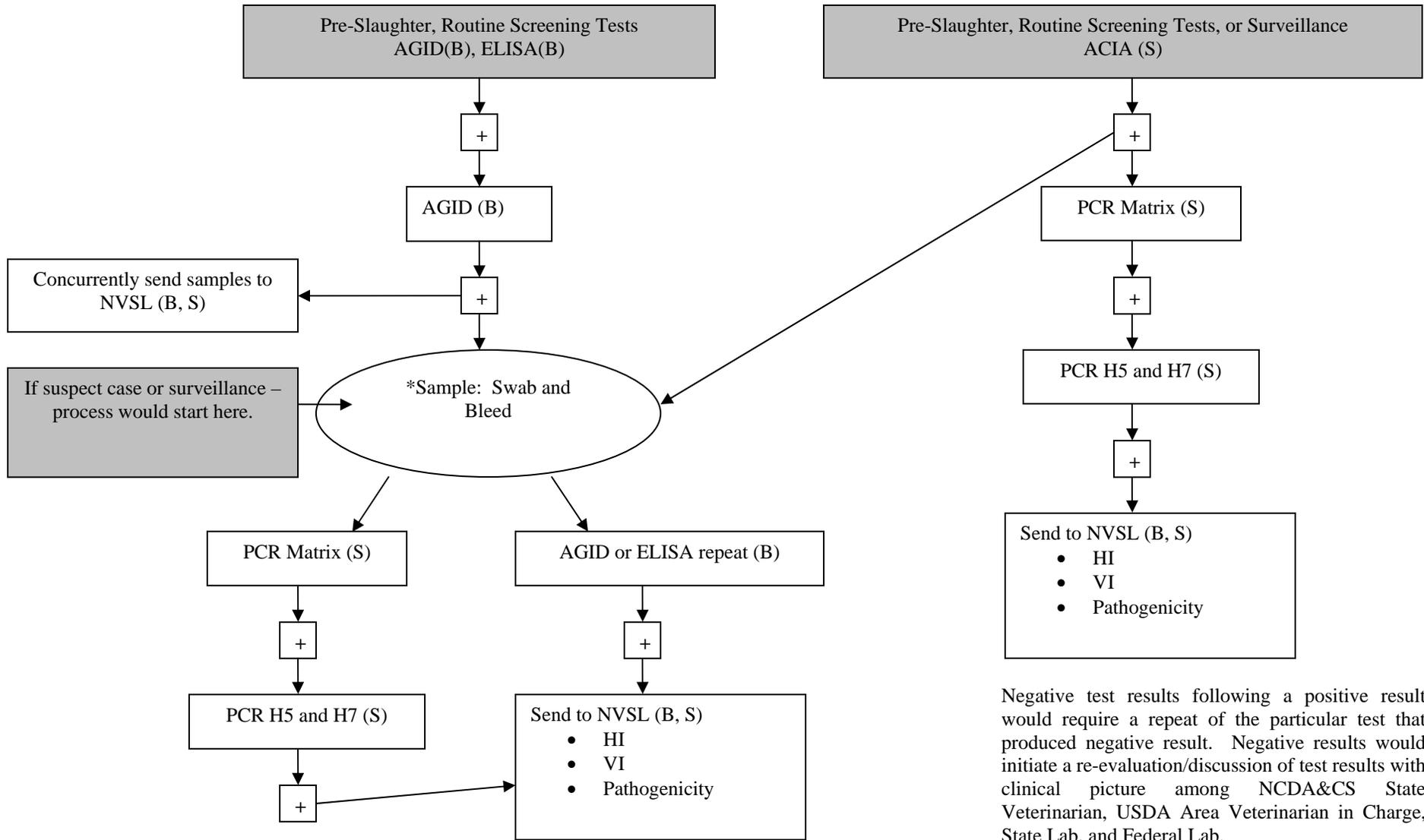
Proper Donning and Doffing procedures for PPE are included in Appendix G and vary depending upon the type of respiratory protection used.

#### **D. Diagnosis Flow Chart**

Both LPAI and HPAI are reportable animal diseases in NC. NC Administrative Code (NCAC) 52C.0603 requires that all persons practicing veterinary medicine in NC report Avian Influenza within 2 hours after the disease is reasonably suspected to exist. NCAC 52B.0606 requires that each hatchery report infectious diseases that affect their supply flocks.

When there are clinical signs suggestive of AI in a commercial poultry flock it is the responsibility of the grower or service personnel to alert company representatives. Company representatives are to notify the SV's office. Diagnostic samples should be delivered to Rollins Animal Disease Diagnostic Laboratory Appropriate samples are serum for AGID and oropharngal or tracheal swabs for RRT-PCR, ACIA and virus isolation. See **Appendix G** for information on sample collection for RRT-PCR and virus isolation.

Avian Influenza Diagnosis Flow Chart

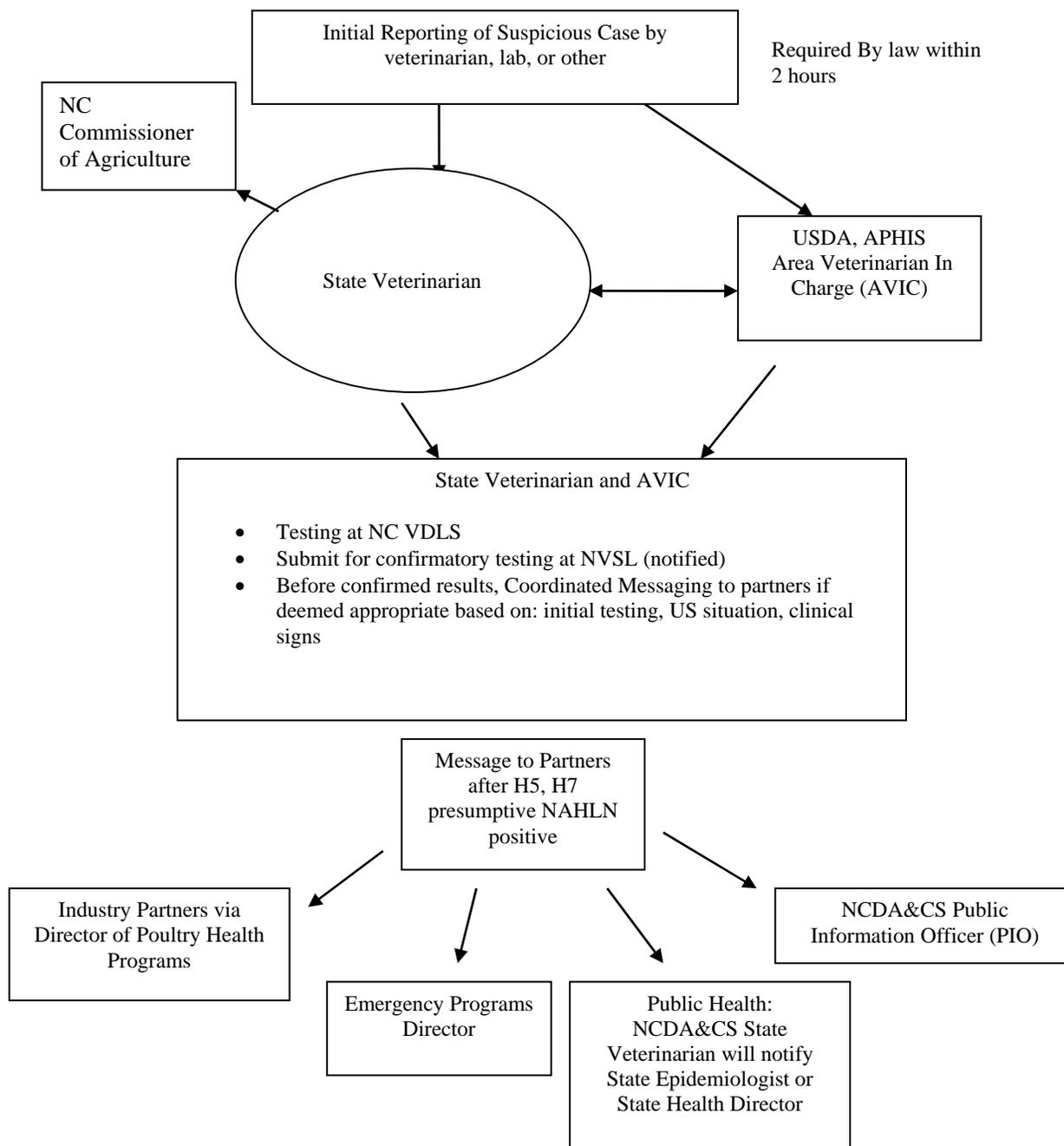


Negative test results following a positive result would require a repeat of the particular test that produced negative result. Negative results would initiate a re-evaluation/discussion of test results with clinical picture among NCDA&CS State Veterinarian, USDA Area Veterinarian in Charge, State Lab, and Federal Lab.

Key: +=positive test result, B=Blood, S=Swab, T=Tissue, AGID=Agar gel immunodiffusion, ELISA=Enzyme-linked immunosorbant assay, PCR=Polymerase chain reaction, VI=Virus Isolation, HI=Hemagglutination inhibition

\* Poultry: tracheal or oropharyngeal sampling; Waterfowl: tracheal or oropharyngeal and cloacal sampling. For sample size, see chart in appendix S

### E. Reporting Flow Chart



\*\*Additional notifications will occur subsequently including but not limited to: NC Wildlife Resources Commission, NC Emergency Management, local officials, DENR, NC State CVM, and others necessary for response.

After Notifications:  
JIC (Joint Information Center) established with PIOs from involved agencies including NCDA&CS and PH to coordinate messages.

Key: APHIS= Animal and Plant Health Inspection Service, NAHLN= National Animal Health Laboratory Network, NC VDLS= North Carolina Veterinary Diagnostic Laboratory System,, NVSL= National Veterinary Services Laboratories

## F. State Quarantine Process

- The SV or an authorized representative may place under quarantine any poultry suspected to be infected, affected with or exposed to AI in accordance with NC General Statute §106-401.1.
- No poultry under **state quarantine** shall be moved from the place of quarantine, unless permitted by the SV or an authorized representative.
- Quarantine shall remain in effect until cancelled by official written notice from the SV or an authorized representative and shall not be released or cancelled until the sick or dead poultry have been properly disposed of and the premises have been properly cleaned and disinfected.
- **A state quarantine** may be placed on **suspicious flocks** prior to receiving test results at the discretion of the SV.
- **Flocks with positive serology or positive antigen detection will be quarantined until results are confirmed and subtype is determined.**
- Under **state quarantine**, there will be no movement of poultry or poultry products except under permit from the SV's office if AI is suspected. Proper biosecurity measures must be used.
- **Vaccinated flocks (H1 and H3)** with positive serology will be placed under increased biosecurity until the subtype is determined. If significant clinical signs or elevated mortality are present in the vaccinated flock, a **state quarantine** will be placed on the farm until additional samples for virus detection can be tested.  
Movement of people on and off the farm should follow proper biosecurity procedures. Only essential personnel are allowed to enter the affected promise.

## G. Containment Areas

Three containment areas (Infected Premise, Control Zone, and Buffer-Surveillance Zone) will be established at the discretion of the North Carolina State Veterinarian (SV) or his duly authorized representatives (referred to as SV for the remainder of this section). Each **Infected Premise** will be surrounded by a **Control Zone**, which will be surrounded by an even larger **Buffer-Surveillance Zone**. The three containment areas are used to 1) describe the different restrictions and guidelines on the movement of live and dead animals into and out of the containment areas, 2) describe the different restrictions and guidelines for movement of people, litter, and equipment into and out of the containment areas, 3) describe the differences in cleaning and disinfection guidelines of people and equipment working with birds within the containment areas, and 4) describe the differences in surveillance during an Avian Influenza (AI) incident for the containment areas. These guidelines are created to minimize the risk of virus spread into uncontaminated areas. Movement, biosecurity, surveillance guidelines in the containment areas may be modified by the SV as needed to contain an AI threat.

### 1. Definition of Areas

**Infected Premises:** An Infected Premise is an area of property with one or more birds that fall into at least one of the following descriptions and therefore the site may be contaminated with infectious virus.

- 1) Positively identified with AI
- 2) Suspected to have AI based on clinical signs, preliminary testing, and/or epidemiological link as per SV
- 3) Come into contact with birds, people, or equipment that may have carried the AI virus

**Control Zone:** The Control Zone begins where the Infected Premise driveway and State road intersect and extends to a distance designated by the SV. The Control Zone may contain one or more Infected Premises.

**Buffer-Surveillance Zone:** The Buffer-Surveillance Zone is the area just outside the Control Zone that extends outwards to a distance designated by the SV.

The Control Zone will extend approximately 2 miles around the Infected Premise and the Buffer-Surveillance Zone will extend approximately 4 miles beyond the Control Zone (6 miles from Infected Premise). However, specific size and shape will be set by the SV considering the following factors:

1. Poultry population densities
2. Traffic patterns and human demographics
3. Weather conditions which may affect transmission
4. History and characteristics of the outbreak
5. Decision to implement a pre-emptive cull policy
6. Commercial industry and trade partner considerations
7. Topography and natural geographical borders

## 2. Response by Containment Area

### a. Surveillance

Surveillance will be implemented as soon as possible after an AI incidence has been identified. A minimum of **10 birds per house** will be tested by oropharyngeal or tracheal swabs (2 pools of 5 birds each) with emphasis on testing of fresh daily mortality. Prioritization of sampling as well as processing samples will be given to flocks within the Control Zone (yellow) and flocks that are within 48 hours of movement. Owners or preferably company representatives for all farms in the Control Zone (yellow) and Buffer-Surveillance Zone (blue) must contact an assigned SV representative within the Incident Command system by phone to provide details of daily mortality for each farm. Further testing of these farms may be implemented based on the mortality (see below).

Different diagnostic methods will be used depending on the circumstances at the discretion of the SV. NCDA&CS, industry and USDA personnel will work together to coordinate sampling. Testing within the first 48 hours will focus on RRT-PCR testing to maximize early detection of positive farms within the Control Zone (yellow) and allow potential movement of negative farms within the Buffer-Surveillance Zone (blue) that are within 48 hours of processing. However, if the laboratory system is unable to process all sample by PCR due to capacity issues, then Antigen Capture Immunoassay (ACIA) will be used in conjunction with PCR testing. In this eventuality, prioritization will be made by the SV for PCR testing (i.e. preference to pre-

movement flocks, etc.). In certain circumstances, ACIA may be performed on site as an additional indicator of safety for personnel movement from farm to farm.

Samples submitted to the lab will be color coordinated based upon source of sample to facilitate accurate reporting and optimal processing time. Samples from each of the containment areas will be color coded specific to each area; **INFECTED PREMISE (RED)**, **CONTROL ZONE (YELLOW)**, and **BUFFER-SURVEILLANCE ZONE (BLUE)**. The exception will be that any flocks that are being tested **WITHIN 48 HOURS OF MOVEMENT** will be color coded **GREEN**.

At the discretion of the Incident Commander, barrel surveillance may be instituted at the end of driveways at each farm. It can be used to collect samples from all flocks within the Control Zone (yellow) and Buffer-Surveillance Zone (blue), see **Appendix (H)**. Additionally, high risk farms identified at any time during the surveillance period will undergo barrel surveillance within 24 hours. High risk farms may be defined by one or more of the following criteria:

1. mortality greater than 3 per 1,000 in birds older than 2 weeks of age
2. increases in mortality of 1 per 1,000
3. egg production losses of >2% or
4. epidemiological links to an infected or suspect farm even if the farm in question is located outside of the set Containment Areas

All surveillance information will be captured at the Incident Command Center, location to be determined based on circumstances.

Surveillance for each of the containment areas is provided on the Surveillance Summary Sheet. The Surveillance Summary Sheet may be used as a stand alone guide to facilitate a field response.

## Minimum Surveillance Summary Sheet

**INFECTED PREMISES (RED):**

- + First 24 hours: Confirm infection and depopulate birds

**CONTROL ZONE (YELLOW):**

- + First 24 hours: Begin and hopefully complete sampling all flocks by rRT-PCR
- + Days 3-8: Repeat testing on all remaining flocks
- + Until 2 consecutive weeks with no positive virus tests (litter or birds):
  - a) Test all flocks weekly
  - b) Test all flocks within 48 hours of movement
  - c) Daily phone mortality reports will be made\*
- + Until 6 consecutive weeks with no positive virus tests (litter or birds):
  - a) Test all flocks within 48 hours of movement
  - b) Daily phone mortality reports will be made\*

**BUFFER-SURVEILLANCE ZONE (BLUE):**

- + First 48 hours: Begin and hopefully complete sampling all flocks by rRT-PCR
- + Days 3-8: Repeat testing on all flocks if resources are available
- + Until 2 consecutive weeks with no positive virus tests (litter or birds):
  - a) Test all flocks within 48 hours of movement
  - b) Daily phone mortality reports will be made\*

\* Daily phone mortality/production reports will be made by the owner or company representative to a SV representative. Any flock with 1) mortality greater than 3 birds/1,000 2) increase in mortality by 1 bird/1,000 or 3) drop in egg production by 2% or more will be tested within 24 hrs.

## b. Permitting of Movement Overview

If zone is not specified, all zones apply.

### Authority for permitting:

NCDA&CS will be the authority to issue permits if necessary during an outbreak.

One of the objectives of NCDA&CS during an AI outbreak is to contain the disease by preventing its spread due to the movement of infected birds or contaminated equipment and trucks.

### Applying for permits:

As for any bird, product, or substance that has been tested for presence of avian influenza, the **diagnostic report detailing the result will serve as the permit**. (The exception is any test result from an infected premise, see above.)

Previously infected premises (prior to resuming operation) will require a permit from NCDA&CS State Veterinarian or designee. The requesting company will submit a permit request by email, fax, or web form. Depending on capabilities, the SV will decide method of choice for permit request submission. Following submission, the request will be analyzed by SV or designee. Permit will be issued or declined within a timely manner via email, fax, or phone (phone will only be utilized if necessary and will obviously not allow for issuing of permit.)

\*\*States other than NC may require special permitting for movement of birds or products into or through those states.

### Required to be permitted:

1. Live birds testing negative for AI moving in <48 hours.
2. Eggs and Semen
3. Litter or compost pile
4. Previously infected premises prior to resuming operation

1. **AI negative birds moving in < 48 hours:** All poultry standing by to go to processing will be tested within 48 hours of desired transport time. If negative, these flocks will be allowed to move, but appropriate protocols for cleaning and disinfecting of vehicles within zones must be followed. **The negative laboratory results and reports will serve as the company's permits.** This will minimize duplicity of providing company with another document that permits and summarizes already prepared and existing information from diagnostic laboratory. The company is obligated to report movement of live birds to SV or authorized representative prior to that movement.

2. **Documentation of weekly negative AI test of origin flock is sufficient for movement of Eggs and Semen.**

3. **Litter or compost pile:** All litter and compost piles from premises within the control or buffer-Surveillance Zones may not move except under permit from SV after testing negative avian influenza. If negative, these substances will be allowed to move, but vehicles must be cleaned and disinfected prior to leaving the premise and again after dumping litter. **The negative laboratory results and reports will serve as the company's permit.** When litter is allowed to move without permit by SV, the SV will notify companies by zones.

4. **Infected premises prior to resuming operation:** Prior to placing birds on properties that have been infected with avian influenza during the current outbreak, the premises will need to be inspected and permitted by SV. Prior to permitting, all samples (i.e compost or litter, poultry house, environmental or other) must test negative. In addition, proper cleaning and disinfecting of premises followed by inspection by NCDA&CS is required. **Quarantine on the premise must be released prior to resuming operations.**

### c. Bird Movement In/Out

Bird movement on or off of premises within each of the containment areas is provided on the Bird Movement Summary Sheet. The Bird Movement Summary Sheet may be used as a stand alone guide to facilitate a field response. No bird (poultry or otherwise) may be moved on or off a premises in any of the containment areas unless permitted by SV during an AI incident.

Please see summary next page.

## Bird Movement Summary Sheet

**INFECTED PREMISES (RED):**

+ ) No bird may be moved on or off unless permitted by SV

+ ) **No bird may be moved in for at least two weeks after the last positive virus detection (litter, birds, or environment) \***

**CONTROL ZONE (YELLOW):**

+ ) No bird movement off a premise within first 24 hours of identification of the index Infected Premise (case) and until initial RRT-PCR screening within the Control Zone is complete by SV

+ ) Birds must test negative within 48 hours of sample collection to movement

+ ) **No bird may be moved in for at least two weeks after the last positive virus detection (litter, birds, or environment) within the Control Zone \***

**BUFFER-SURVEILLANCE ZONE (BLUE):**

+ ) No bird movement off a premise within first 24 hours of identification of the index Infected Premise (case) and until initial RRT-PCR screening within the Control Zone is complete by SV

+ ) Birds must test negative within 48 hours of sample collection to movement

+ ) **No bird movement in until all remaining poultry flocks in the Control Zone have two consecutive negative tests at 1 week intervals\***

\* Bird deliveries to farms will be in disposable containers only. Drivers must stay in the delivery vehicle for all deliveries. The delivery vehicle must be cleaned and disinfected after delivery, prior to leaving the farm.

### **d. Movement Poultry Products (Eggs & Semen)**

There shall be no movement of poultry products within the containment areas until the initial RRT-PCR flock screening is complete, (minimum 48 hours). At that time, egg and semen shipments can resume. Commercial hatching or table eggs will not be destroyed unless supported by individual risk assessment and RRT-PCR or virus isolation from each lot of eggs.

Destruction of capital assets or equipment during premises decontamination, following an HPAI event, is required only under the most unusual circumstances and should proceed only with the approval of the appropriate financial officer and SV.

Eggs moving from an AI-negative laying farm in the Control Zone (yellow) to packaging, further processing, or to a hatchery must be sanitized on the farm and will be allowed to move after negative AI testing on a weekly basis. Trucks must be cleaned and disinfected before leaving the farm. Egg packaging facilities or breaker plants located within the Control Zone (yellow) will be allowed to retail clean eggs and egg products from clean farms outside the Control zone in sealed trucks if testing requirements are met.

For more detailed information on product movement, consult **Appendices L and M**, Movement Guidelines from the United Egg Producers and the National Turkey Federation. **In all cases, if the plans in Appendices L and M do not agree with this NC Response Plan, the guidelines enumerated in this plan take precedence.**

## **3. Biosecurity Requirements**

Biosecurity is an important element of a poultry company's health program. Following strict biosecurity guidelines reduces the chance that diseases such as AI will be introduced into a commercial poultry flock. During an AI outbreak, biosecurity is critical for disease control. Enhanced biosecurity measures must be implemented by all farms in NC. The following are specific measures to be implemented.

Recommended practices for general biosecurity are found in **Appendix I**. Biosecurity measures for farm visitors are found in **Appendix J**. A list Environmental Protection Agency (EPA) approved disinfectants with efficacy against AI is given in **Appendix K**, along with information on how to look up manufacturer label information on the internet to determine proper concentrations and contact times.

Biosecurity guidelines for people, equipment, and vehicles in each of the containment areas are provided on the Minimum Biosecurity Guidelines Summary Sheet. The Surveillance Summary Sheet may be used as a guide to facilitate a field response. More specific details on biosecurity requirements during an AI incident follow the summary sheet. Live haul personnel must follow a stricter biosecurity protocol as detailed within the summary sheet.

### Minimum Biosecurity Guidelines Summary Sheet.



#### **INFECTED PREMISES (RED):**

- + ) First 24 hours: Lock down site of all non-essential personnel
- + ) Restricted access for personnel, equipment, and non-bird animals except by authorization of the SV
- + ) All exiting personnel must shower and change clothing when leaving the premise
- + ) All equipment must be cleaned and disinfected including the inside and outside of all vehicles when leaving the premise

#### **CONTROL ZONE (YELLOW):**

- + ) First 24 hours: Lock down site of all non-essential personnel
- + ) All personnel exiting from control zone farms will be required to change clothing before visiting another farm, and leave disposable PPE on farm or double bag and disinfect PPE for later cleaning
- + ) All equipment from control zone farms must be cleaned and disinfected including the inside and outside of all vehicles when leaving the farm

#### **BUFFER-SURVEILLANCE ZONE (BLUE):**

- + ) Shoes, all equipment, and the undersides of vehicles must be cleaned and disinfected when exiting farms
- + ) Disposable clothing should be worn and properly disposed of while visiting farms

Once a premises has been quarantined by the SV under suspicion of AI or by definitive diagnosis, then all movement within the Control Zone will halt until all farms within the Control Zone are tested for AI. At that time, then movement into and out of the Control Zone can commence if permitted by the SV. Movement may include, but not be restricted to, feed trucks, shavings trucks, live haul, clean out equipment and crews, bird delivery, semen transport, egg pick up, raw and cooked meat, and offal to rendering. Please refer to addenda from United Egg Producers (Appendix M) and National Turkey Federation (Appendix N) for further examples. Companies should keep records of movement of all crews and vehicles and equipment during the quarantine period in the Control and Buffer-surveillance Zones.

**a. Feed Delivery:** Within the Control Zone, single deliveries are recommended. The truck driver will be responsible for cleaning and disinfection of the truck as it leaves the premise. It is strongly recommended that transfer\_feed be delivered to another farm within the same zone.

**b. Live Haul:** Live haul crews can catch birds from multiple farms within the containment areas as long as they never go to a farm within the Buffer-Surveillance Zone (blue) after visiting a farm within the Control Zone (yellow) without a shower, change of clothes, and 24 hours down time. Crews that have worked in either of the Control Zone (yellow) or the Buffer-Surveillance Zone (blue) must also shower and change clothes at the end of the day and additionally must be down for 24 hours before visiting a farm outside of all containment areas. The crew will wear clean clothes and footwear. Equipment, clothing, and footwear must be cleaned and disinfected following load out. All loading equipment brought to the farm must be cleaned and disinfected as it leaves the premise.

**c. Processing:** After all farms within the Control Zone (yellow) are tested negative, antigen negative birds raised for consumption within the Control Zone should be moved to slaughter as soon as the processing facility can handle the birds. Clearing the Control Zone of all antigen negative birds should be the highest priority. All flocks within the Control Zone must be antigen tested within 48 hours of movement. The contract grower or the live haul crew will kill all cull birds on negative farms. No virus positive birds will be processed. Virus Positive birds must be euthanized as directed by the SV to reduce the risk of human exposure and dispose of the birds expediently. No live birds will remain on the farm.

**d. Farm Traffic:** There will be restrictions on all farm traffic within the Control Zone (yellow) and Buffer-Surveillance Zone (blue). All companies who do business with poultry

producers should develop protocols to monitor traffic patterns and utilize basic biosecurity procedures when entering poultry farms. Poultry producers should maintain a current list of vendors who visit their poultry farms and contact them as quickly as possible in the event of farm quarantine. Major roads that run through the Control Zone (yellow) may be temporarily re-routed. Traffic on smaller roads may be stopped and disinfected prior to leaving the Control Zone.

**1. Fuel/Energy:** Fuel and electrical meters within the Control Zone (yellow) and Buffer-Surveillance Zone (blue) will be read by the contract grower and reported by telephone. All fuel company vehicles will be cleaned and disinfected by the grower before leaving the farm. On demand meters require a trained person with special equipment in order to be read.

**2. Flock Supervisors:** All routine flock visitation within the Control Zone (yellow) and Buffer-Surveillance Zone (blue) is to be discontinued until the scope of the disease outbreak is determined.

**3. Vaccination and Insemination Crews:** Crews may visit no more than one flock per day in the Control Zone. Crews may not re-enter a flock until it has been tested negative for AI. In the Buffer-surveillance Zone the same rules apply until the farm is tested negative. Companies should document movement during this time.

**From the beginning of an AI incident, all farms within the Control Zone (yellow) and Buffer-Surveillance Zone (blue) are required to dispose of mortality on the farm unless another method is approved by the SV.** NCDA&CS will monitor rendering sites and landfills for compliance. For on-farm composting, mortality must be composted for at least 14 days. Every 7 days, the material should be sampled following the approved protocol (**Appendix O**). If viable virus is detected, the compost should be turned and re-sampled in 7 days. Compost from houses that have completed the 14 day requirement and from which no viable virus is detected will be known as approved manure. Only approved manure will be allowed to move on or off the farm of origin. A permit from the SV office will be required in order to move approved manure.

**e. Litter:** No litter is to be removed from any farm within the Control Zone (yellow) or the Buffer-Surveillance Zone (blue) until all initial testing has been reported. At that time, litter from virus negative farms may be removed from farms under permit by the SV. The litter must be moved in covered trucks, and the trucks must be cleaned and disinfected after moving the litter.

## 4. Cleaning and Disinfection Overview

This summary is to designate who, when, and what should follow appropriate cleaning and disinfecting protocols. For a protocol on proper cleaning and disinfecting, please see appendix S. If the zone is not specified, all zones are subject to below guidelines.

### **Equipment/Vehicles:**

All equipment and vehicles traveling to premises within the zones outlined by the SV should be cleaned and disinfected when leaving the premises. This includes the undersides of vehicles, tires, and wheel wells. It is expected that each farm will have proper decontamination equipment to accomplish this necessary step in biosecurity. If possible, it is desirable for all vehicles to park as far from the poultry houses as reasonably feasible, ideally where the state road meets the property. By parking vehicles a reasonable distance from poultry houses, vehicle contamination is minimized.

Decontamination equipment may include but is not limited to: power washer, sprayer, appropriate disinfectant, water source, scrub brushes, etc. For a list of disinfectants labeled as viricidal against avian influenza, see appendix L

Vehicles requiring disinfection include but not limited to: feed trucks, live haul trucks, fuel/energy company trucks, flock supervisor vehicles, litter removal vehicles, vehicles transporting poultry or poultry products to processing, other company vehicles, and any state or federal government vehicles.

### **Personnel:**

All personnel traveling to premises within the zones outlined by the SV should decontaminate themselves in addition to equipment and vehicles upon leaving the premises. This includes removing and discarding contaminated clothing, and disinfecting personal protective equipment when appropriate (i.e. boots, goggles, glasses, etc.). In the case of HPAI, personnel will be required to shower when exiting an infected premise, a premise suspected to be infected, or when deemed necessary by the SV.

Any strike teams activated by NCDA&CS will be equipped with appropriate decontamination equipment and supplies to decontaminate themselves as well as their equipment and vehicles.

During an incident (especially if there are multiple infected premises), it may be appropriate for NCDA&CS to set up a common decontamination station that would be utilized in addition to the cleaning and disinfecting that occurs upon leaving the premises. In this situation, strike teams will utilize this decontamination after appropriately cleaning and disinfecting their vehicle when leaving the farm before visiting the next premises, traveling within the zones or out of the zones, delivering samples to the lab, reporting to the EOC, going home for the day, etc.

### **Property:**

If any poultry, poultry products, equipment, litter, environmental, or other samples test positive for avian influenza, proper cleaning and disinfecting is required of the property from which the test result came. Following proper cleaning and disinfecting, the property will be

inspected and samples will be collected by an NCDA&CS representative for diagnostic testing. NCDA&CS personnel would sample: poultry house, environmental if appropriate, compost pile, or litter, equipment, or other as designated by the SV. For sampling protocols, see Appendix P.

Any infected premises will not be permitted to resume operations and move birds onto any infected property until inspected after proper cleaning and disinfecting has been performed.

## 5. Quarantine Release Procedure-Infected Premises: Cleaning, Disinfection and Sampling

### a. NCDA&CS Quarantine Release for AI–infected Meat Type or Meat-Breeder Poultry Farm

#### 1. Litter Management

When birds are composted in-house, see **Appendix O** for sampling protocol.

- After depopulation, litter must remain in-house for at least 14 days with curtains drawn and doors closed. All residual feed in bins should be removed from bin and placed with litter. It is recommended that the house be heated, if possible, for 48 to 72 hours to a temperature of 90 – 100 degrees. NCDA&CS or other authorized personnel will apply tape or seals on doors at depopulation to prevent unauthorized entry.
- Seven days or more after sealing the poultry house, the litter will be sampled using the approved protocol (see **Appendix O**). Biosecurity procedures will be followed. If viable virus is detected, the litter will be re-sampled no less than 7 days following the initial sampling. Litter from houses that have completed the 14-day requirement, and from which no viable virus is detected, will be known as **approved litter**.
- Only **approved litter** will be allowed to move. A negative AI test report may act as the permit to move litter. The permit must state the destination of the approved litter and this destination must be acceptable to SV.
- The current laws and regulations of the State of NC pertaining to poultry litter management should be followed unless otherwise authorized by an appropriate authority.
- Prior to movement of litter off the farm of origin by truck, tarps must be tightly fastened over the edges of the truck bed so that litter cannot blow out. The exterior of the truck

must be swept clean and the undercarriage, wheels and wheel wells sprayed with disinfectant.

- After delivering litter, truck beds will be swept clean at the point of destination, cleaned and disinfected.

## **2. Cleaning and Disinfection of Houses, Equipment and Slats (if present)**

- All residual feed in the bins must be removed and disposed of with the litter when it is removed.
- Houses should be thoroughly power washed to remove organic material before disinfecting, including slats, feeders, waterers, and air vents. Any equipment that cannot be power washed (e.g. electrical equipment) should be blown clean.
- The egg storage rooms, workshops and other storage areas should be thoroughly cleaned.
- When cleaning is complete, disinfect with an approved disinfectant.
- When cleaning and disinfection has been completed, the owner will contact the NCDA&CS who will have a representative inspect the facility. If the NCDA&CS representative approves the cleaning and disinfection of the facility, the NCDA&CS representative will arrange for the facilities to be sampled to determine whether viable virus is present. Ten swabs (two swab pools of 5 swabs each) will be taken from random sites in each house on the floors, slats, feeders, waterers, walls and vents. All swabs must be negative before quarantine can be released.
- When cleaning and disinfection has been approved, all swab samples are negative for viable virus and the facility has no poultry for a minimum of 14 days, the quarantine will be released.

### **b. NCDA &CS Quarantine Release for Table Egg Layer Poultry Farm**

#### **1. Manure Management**

- After depopulation, manure/litter must remain in house for at least 14 days with curtains drawn and doors closed. NCDA&CS or other authorized personnel will apply tape or seals on doors at depopulation to prevent unauthorized entry.

- Seven days or more after depopulation of poultry, the manure will be sampled using the approved protocol (see **Appendix O**). Biosecurity procedures will be followed. If viable virus is detected, the manure will be re-sampled no less than 7 days following the initial sampling. Manure from houses that have completed the 14 day requirement, and from which no viable virus is detected, will be known as **approved manure**.
- Only **approved manure** will be allowed to move on or off the farm of origin. A negative AI test document may be used as the permit for movement of litter.
- The current laws and regulations pertaining to poultry manure management should be followed unless otherwise authorized by an appropriate authority.
- Prior to movement of manure off the farm of origin by truck, tarps must be tightly fastened over the edges of the truck bed so that litter cannot blow out. The exterior of the trucks must be swept clean and the undercarriage, wheels and wheel wells sprayed with disinfectant.
- After delivering manure, truck beds will be swept clean at the point of destination, cleaned and disinfected.

## **2. Cleaning and Disinfecting of Houses, Coolers, Egg Sorting and Storage Areas**

- All residual feed in the bins must be removed and disposed of with the litter.
- Houses should be thoroughly power washed to remove organic material before disinfecting, including cages, egg handling equipment, feeders, waterers, air vents, and manure pits. Any equipment that cannot be power washed (e.g. electrical equipment) should be blown clean.
- The egg processing facilities and equipment, egg storage coolers, workshops and other storage areas should be thoroughly cleaned.
- When cleaning is complete, disinfect with an approved disinfectant.
- When cleaning and disinfection has been completed, the owner will contact the NCDA&CS who will have a representative inspect the facility. If the NCDA&CS representative approves the cleaning and disinfection of the facility, the NCDA&CS representative will arrange for the facilities to be sampled to determine whether viable virus is present. Ten swabs (2 pools of 5 swabs each) will be taken from random sites

in each house on the floors, cages, egg handling equipment, feeders, waterers, walls, vents, and manure pits. All swabs must be negative before quarantine can be released.

- Any lagoon with drainage from an infected poultry house will be treated to lower the pH of the lagoon water to pH 5.5 or lower.
- When cleaning and disinfection has been approved, all swab samples are negative for viable virus and the facility has no poultry for a minimum of 14 days, the quarantine will be released.

### c. NCDA&CS Quarantine Release for Infected Backyard Farm

- Clear away any debris present that might make cleaning and disinfection ineffective.
- Thoroughly clean any feeders, waterers, cages or perches present on the farm. If wooden cages or other equipment is present that cannot be disinfected, destroy in the case of HPAI infection..
- Treat all equipment and bird areas with approved disinfectant
- Place equipment and cages in sunlit area if possible
- Depending upon the size of the flock, return after C and D and take 5-10 environmental swabs of equipment, cages, and surroundings to check for AI presence.
- When premise has been sitting idle for 14 days past the negative AI environmental test, NCDA&CS may consider removing the quarantine. In some cases, the SV may decide to extend the quarantine due to other risk factors (ex. wild bird access), and may place sentinel birds onto the property prior to allowing repopulation.

## VII. Appraisal and Indemnification

Appraisal and indemnification will be carried out as described in 9CFR 53 Subpart A for HPAI and 9CFR56 Subpart A for LPAI. See (**Appendix P**). Additional comments concerning appraisal are included in Appendix G from the *Summary of the National Highly Pathogenic Avian Influenza Response Plan*, September, 2007. To view this plan, go to the following website:

<http://www.aphis.usda.gov> and search on AI National Plan Summary 2007.

In the event of a confirmed H5 or H7 HPAI or LPAI infection in a poultry flock in NC( that is participating in the LPAI Indemnity Plan in the case of LPAI), USDA APHIS may provide indemnity for the cost of the flock, depopulation, cleaning and disinfection and post-infection surveillance. Indemnification will depend upon compliance of owners of infected poultry with the requirements of any state or federal quarantine placed upon their property as well as 9CFR 53 Subpart A and/or 9CFR56 Subpart A. In addition, if owners of birds covered under the *Uniform Standards for Prevention and Control of H5 and H7 Low Pathogenicity Avian Influenza in the Live Bird Marketing System* desire indemnification, they must comply with the general criteria for indemnification listed in the Uniform Standards document. Indemnification will require a signed Compliance agreement between USDA, APHIS, Veterinary Services, the Official State Agency (State Veterinarian), the bird owner and the grower/producer (see **Appendix Y** for template).

## **VIII. Depopulation**

- Birds will be humanely depopulated using methods approved by the *American Veterinary Medical Association Guidelines on Euthanasia* (September 15, 2007,) see <http://www.avma.org/resources/euthanasia.pdf>.
- Recently, USDA APHIS (**see Appendix Q**) and the AVMA have approved water-based foam as a method of mass depopulation acceptable in emergent situations like AI outbreaks. This method is limited to birds included in the following groups:
  1. Floor-reared poultry—NCDA&CS will consider use of water-based foam for depopulation of other types of birds as research is developed indicating humaneness of the method for other groups.
  2. Animals infected with a potentially zoonotic disease such as AI
  3. Animals experiencing an outbreak of a rapidly spreading infectious disease that, in the opinion of state or federal regulatory officials, cannot be contained by conventional or currently accepted means of depopulation.
- NCDA&CS would also consider new humane depopulation methods resulting from future research or as described in the World Organization for Animal Health manual or by resolution from USDA APHIS, AVMA, US Animal Health Association or National Institute of Animal Agriculture.

## **IX. Disposal**

One of the major objectives of the eradication program is prompt and effective disposal of infective material in which virus could persist (e.g. fresh and frozen carcasses, dead birds, eggs, litter, manure, waste products, fittings and building materials that cannot be effectively decontaminated). Potential methods include composting, burial, incineration, burning, and rendering.

Composting within the poultry house is the preferred method of initial decontamination, as this prevents dispersal of the virus by aerosol. However, composting may be accomplished on the premises either in the house, in silage bags, on adjacent land, or at an approved central location. Composting within and outside of the house may not be feasible depending on the availability of carbon sources and space required (i.e. for an average 12' wide by 6' tall compost pile, you can utilize only ~300lbs of animal matter per linear foot), therefore alternative methods may be permitted by the SV under special circumstances. See **Appendix D** for guidelines on in-house composting.

On-site burial is an inexpensive method of disposal that minimizes the transportation of infected materials; however, it may not be a suitable method for several reasons. First, mass burial on property must be reported on the land deed and may adversely affect the land value upon sale. Second, requirements for burial that protect the NC underground aquifer may make many sites in the eastern part of the state unsuitable for this method.. Off-site burial may be needed when on-site is not possible or when a number of infected farms have to be depopulated in a given area where a common burial site would be more efficient. Municipal solid waste landfills that accept mortality may also be used. See **Appendix N** for a list of approved municipal solid waste landfill sites.

Incineration is an expensive but effective means of safe disposal of infected material. Incinerators large enough to be practical for large numbers of animals are generally not available. Burning has been used if burial sites are unavailable but expense and environmental issues may be prohibitive.

Rendering may be another means of disposal if the rendering plant has the capacity needed and if it can be effectively decontaminated afterwards. However, the SV may prevent all dead birds from leaving any poultry farm and being taken to a rendering company to minimize possibility of virus transmission. The SV may also monitor the entrance of any rendering company where the movement of birds has been prohibited, cite violators, and require disinfection of vehicles and people coming from farms with dead birds.

If infected material is to be transported off farm for disposal, the SV must first authorize this movement and require the transporters to minimize factors that could contribute to spread of the virus. Trucks used to haul infected material must have body trays or bladders that are waterproof and all loads must be covered with tarpaulins to ensure load security.

## **X. Epidemiologic Investigation**

An epidemiologic investigation of will be conducted during any AI incident for infection found within the bird population. The information obtained from tracing will be used to identify any epidemiologically linked premises and the extent of the quarantine zones. Support for this activity may be provided by USDA APHIS.

Once a potential avian case has been identified, an epidemiologist will initiate in-depth trace-back and trace-forward investigations. Industry personnel and growers will be asked to assist in tracing animal movements in and out of the positive premises during the previous 21 days, focusing on the past 3-7 days. Personnel, equipment and vehicle movement information will also be requested at this time. Quarantines may be instituted at the trace-back or forward sites at the SV's discretion.

## **XI. Appendices**

- A. Key Facts about Avian Influenza**
- B. Poultry Disease Advisory Committee**
- C. Routine AI Surveillance in NC Poultry**
- D. In-house Composting Procedure**
- E. Protecting Poultry Workers from Avian Influenza**
- F. PPE Donning-Doffing Protocol**
- G. Sample Collection for rRT-PCR and VI**
- H. Barrel Surveillance Procedure**
- I. General Biosecurity Practices**
- J. Biosecurity for Farm Visitors.**
- K. EPA Disinfectants with Labeled Activity against Avian Influenza**
- L. United Egg Producers Movement Guidelines**
- M. National Turkey Federation Movement Guidelines**
- N. Approved Landfill Sites**
- O. Sampling Protocol for Poultry Compost Piles and Environmental Samples**
- P. Appraisal and Indemnification Guidelines**
- Q. AVMA/USDA APHIS Guidelines for Water-Based Foam Depopulation of Poultry**
- R. Sample Size Protocol for Avian Influenza**
- S. Worker Checklist for Exposed Workers**
- T. Public Health Forms**
- U. Sample Press Releases Concerning Avian Influenza**
- V. Incident Command Structure**

**W. Incident Command Structure—Roles and Definitions**

**X. Processing Plants in North Carolina**

**Y. Indemnity Compliance Agreement Template**

**Z. Flock Plan Template**

# Appendix A

## Key Facts About Avian Influenza (Bird Flu) and Avian Influenza A (H5N1) Virus

### • What You Should Know About Avian Flu

*This fact sheet provides general information about avian influenza (bird flu) and information about one type of bird flu, called avian influenza A (H5N1), that has caused infections in birds and in humans. Also see [Questions and Answers](#) on the CDC website and [Frequently Asked Questions \(FAQs\)](#) on the World Health Organization (WHO) website.*

(for complete information, consult <http://www.cdc.gov/flu/avian/gen-info.htm> )

### Avian Influenza (Bird Flu)

#### Avian influenza in birds

Avian influenza is an infection caused by avian (bird) influenza (flu) viruses. These influenza viruses occur naturally among birds. Wild birds worldwide carry the viruses in their intestines, but usually do not get sick from them. However, avian influenza is very contagious among birds and can make some domesticated birds, including chickens, ducks, and turkeys, very sick and kill them.

Infected birds shed influenza virus in their saliva, nasal secretions, and feces. Susceptible birds become infected when they have contact with contaminated secretions or excretions or with surfaces that are contaminated with secretions or excretions from infected birds. Domesticated birds may become infected with avian influenza virus through direct contact with infected waterfowl or other infected poultry, or through contact with surfaces (such as dirt or cages) or materials (such as water or feed) that have been contaminated with the virus.

Infection with avian influenza viruses in domestic poultry causes two main forms of disease that are distinguished by low and high extremes of virulence. The "low pathogenic" form may go undetected and usually causes only mild symptoms (such as ruffled feathers and a drop in egg production). However, the highly pathogenic form spreads more rapidly through flocks of poultry. This form may cause disease that affects multiple internal organs and has a mortality rate that can reach 90-100% often within 48 hours.

#### Human infection with avian influenza viruses

There are many different subtypes of type A influenza viruses. These subtypes differ because of changes in certain proteins on the surface of the influenza A virus (hemagglutinin [HA] and neuraminidase [NA] proteins). There are 16 known HA subtypes and 9 known NA subtypes of influenza A viruses. Many different combinations of HA and NA proteins are possible. Each combination represents a different subtype. All known subtypes of influenza A viruses can be found in birds.

Usually, "avian influenza virus" refers to influenza A viruses found chiefly in birds, but infections with these viruses can occur in humans. The risk from avian influenza is generally low to most people, because the viruses do not usually infect humans. However, confirmed cases of human infection from several subtypes of avian influenza infection have been reported since 1997. Most cases of avian influenza infection in humans have resulted from contact with infected poultry (e.g., domesticated chicken, ducks, and turkeys) or surfaces contaminated with secretion/excretions from infected birds. The spread of avian influenza viruses from one ill person to another has been reported very rarely, and has been limited, inefficient and unsustainable.

"Human influenza virus" usually refers to those subtypes that spread widely among humans. There are only three known A subtypes of influenza viruses (H1N1, H1N2, and H3N2) currently circulating among humans. It is likely that some genetic parts of current human influenza A viruses came from birds originally. Influenza A viruses are constantly changing, and they might adapt over time to infect and spread among humans.

During an outbreak of avian influenza among poultry, there is a possible risk to people who have contact with infected birds or surfaces that have been contaminated with secretions or excretions from infected birds.

Symptoms of avian influenza in humans have ranged from typical human influenza-like symptoms (e.g., fever, cough, sore throat, and muscle aches) to eye infections, pneumonia, severe respiratory diseases (such as acute respiratory distress), and other severe and life-threatening complications. The symptoms of avian influenza may depend on which virus caused the infection.

Studies done in laboratories suggest that some of the prescription medicines approved in the United States for human influenza viruses should work in treating avian influenza infection in humans. However, influenza viruses can become resistant to these drugs, so these medications may not always work. Additional studies are needed to demonstrate the effectiveness of these medicines.

## Avian Influenza A (H5N1)

Influenza A (H5N1) virus – also called “H5N1 virus” – is an influenza A virus subtype that occurs mainly in birds, is highly contagious among birds, and can be deadly to them. H5N1 virus does not usually infect people, but infections with these viruses have occurred in humans. Most of these cases have resulted from people having direct or close contact with H5N1-infected poultry or H5N1-contaminated surfaces.

### Avian influenza A (H5N1) outbreaks

For current information about avian influenza A (H5N1) outbreaks, see our [Outbreaks](#) page.

### Human health risks during the H5N1 outbreak

Of the few avian influenza viruses that have crossed the species barrier to infect humans, H5N1 has caused the largest number of detected cases of severe disease and death in humans. However, it is possible that those cases in the most severely ill people are more likely to be diagnosed and reported, while milder cases go unreported. For the most current information about avian influenza and cumulative case numbers, see the [World Health Organization \(WHO\) avian influenza website](#).

Of the human cases associated with the ongoing H5N1 outbreaks in poultry and wild birds in Asia and parts of Europe, the Near East and Africa, more than half of those people reported infected with the virus have died. Most cases have occurred in previously healthy children and young adults and have resulted from direct or close contact with H5N1-infected poultry or H5N1-contaminated surfaces. In general, H5N1 remains a very rare disease in people. The H5N1 virus does not infect humans easily, and if a person is infected, it is very difficult for the virus to spread to another person.

While there has been some human-to-human spread of H5N1, it has been limited, inefficient and unsustainable. For example, in 2004 in Thailand, probable human-to-human spread in a family resulting from prolonged and very close contact between an ill child and her mother was reported. In June 2006, WHO reported evidence of human-to-human spread in Indonesia. In this situation, 8 people in one family were infected. The first family member is thought to have become ill through contact with infected poultry. This person then infected six family members. One of those six people (a child) then infected another family member (his father). No further spread outside of the exposed family was documented or suspected.

Nonetheless, because all influenza viruses have the ability to change, scientists are concerned that H5N1 virus one day could be able to infect humans and spread easily from one person to another. Because these viruses do not commonly infect humans, there is little or no immune protection against them in the human population. If H5N1 virus were to gain the capacity to spread easily from person to person, an influenza pandemic (worldwide outbreak of disease) could begin. For more information about influenza pandemics, see [PandemicFlu.gov](#).

No one can predict when a pandemic might occur. However, experts from around the world are watching the H5N1 situation in Asia and Europe very closely and are preparing for the possibility that the virus may begin to spread more easily and widely from person to person.

### Treatment and vaccination for H5N1 virus in humans

The H5N1 virus that has caused human illness and death in Asia is resistant to amantadine and rimantadine, two antiviral medications commonly used for influenza. Two other antiviral medications, oseltamivir and zanamivir, would probably work to treat influenza caused by H5N1 virus, but additional studies still need to be done to demonstrate their effectiveness.

For information about H5N1 vaccines, visit <http://www.cdc.gov/flu/avian/gen-info/ga.htm>.

# Questions and Answers About Avian Influenza (Bird Flu) and Avian Influenza A (H5N1) Virus

## Avian Influenza

### How is avian influenza detected in humans?

Avian influenza cannot be diagnosed by symptoms alone, so a laboratory test is required. Avian influenza is usually diagnosed by collecting a swab from the nose or throat during the first few days of illness. This swab is then sent to a laboratory, where they will either look for avian influenza virus using a molecular test, or they will try to grow the virus. Growing avian influenza viruses should only be done in laboratories with high levels of protection. If it is late in the illness, it may be difficult to find an avian influenza virus directly using these methods. If this is the case, it may still be possible to diagnose avian influenza by looking for evidence of the body's response to the virus. This is not always an option because it requires two blood specimens (one taken during the first few days of illness and another taken some weeks later), and it can take several weeks to verify the results.

### What are the implications of avian influenza to human health?

Two main risks for human health from avian influenza are 1) the risk of direct infection when the virus passes from the infected bird to humans, sometimes resulting in severe disease; and 2) the risk that the virus – if given enough opportunities – will change into a form that is highly infectious for humans and spreads easily from person to person.

### How is avian influenza in humans treated?

Studies done in laboratories suggest that the prescription medicines approved for human influenza viruses should work in treating avian influenza infection in humans. However, influenza viruses can become resistant to these drugs, so these medications may not always work. Additional studies are needed to determine the effectiveness of these medicines.

### Does seasonal influenza vaccine protect against avian influenza infection in people?

No. Seasonal influenza vaccine does not provide protection against avian influenza.

### Should I wear a surgical mask to prevent exposure to avian influenza?

Currently, wearing a mask is not recommended for routine use (e.g., in public) for preventing influenza exposure. In the United States, disposable surgical and procedure masks have been widely used in health-care settings to prevent exposure to respiratory infections, but the masks have not been used commonly in community settings, such as schools, businesses, and public gatherings.

### Can I get avian influenza from eating or preparing poultry or eggs?

You cannot get avian influenza from properly handled and cooked poultry and eggs.

There currently is no scientific evidence that people have been infected with bird flu by eating safely handled and properly cooked poultry or eggs.

Most cases of avian influenza infection in humans have resulted from direct or close contact with infected poultry or surfaces contaminated with secretions and excretions from infected birds. Even if poultry and eggs were to be contaminated with the virus, proper cooking would kill it. In fact, recent studies have shown that the cooking methods that are already recommended by the U.S. Department of Agriculture (USDA) and the Food and Drug Administration (FDA) for poultry and eggs to prevent other infections will destroy influenza viruses as well.

So to stay safe, the advice is the same for protecting against any infection from poultry:

- Wash your hands with soap and warm water for at least 20 seconds before and after handling raw poultry and eggs.
- Clean cutting boards and other utensils with soap and hot water to keep raw poultry from contaminating other foods.
- Use a food thermometer to make sure you cook poultry to a temperature of at least 165 degrees Fahrenheit. Consumers may wish to cook poultry to a higher temperature for personal preference.
- Cook eggs until whites and yolks are firm.

The U.S. government carefully controls domestic and imported food products, and in 2004 issued a ban on importation of poultry from countries affected by avian influenza viruses, including the H5N1 strain. This ban still is in place. For more information, see [Embargo of Birds from Specified Countries](#).

**We have a small flock of chickens. Is it safe to keep them?**

Yes. In the United States there is no need at present to remove a flock of chickens because of concerns regarding avian influenza. The U.S. Department of Agriculture monitors potential infection of poultry and poultry products by avian influenza viruses and other infectious disease agents.

For additional information about avian influenza visit [pandemicflu.gov](http://pandemicflu.gov).

## Avian Influenza A (H5N1)

**What is the avian influenza A (H5N1) virus that has been reported in Africa, Asia, Europe, and the Near East?**

Influenza A (H5N1) virus – also called “H5N1 virus” – is an influenza A virus subtype that occurs mainly in birds, is highly contagious among birds, and can be deadly to them.

Outbreaks of avian influenza H5N1 occurred among poultry in eight countries in Asia (Cambodia, China, Indonesia, Japan, Laos, South Korea, Thailand, and Vietnam) during late 2003 and early 2004. At that time, more than 100 million birds in the affected countries either died from the disease or were killed in order to try to control the outbreaks. By March 2004, the outbreak was reported to be under control.

Beginning in June 2004, however, new outbreaks of influenza H5N1 among poultry and wild birds were reported in Asia. Since that time, the virus has spread geographically. Reports of H5N1 infection in wild birds in Europe began in mid-2005. In early 2006, influenza A H5N1 infection in wild birds and poultry were reported in Africa and the Near East.

Human cases of influenza A (H5N1) infection have been reported in Azerbaijan, Cambodia, China, Djibouti, Egypt, Indonesia, Iraq, Lao People's Democratic Republic, Myanmar, Nigeria, Pakistan, Thailand, Turkey, and Vietnam. For the most current information about avian influenza and cumulative case numbers, see the [World Health Organization Avian Influenza website](#).

**What are the risks to humans from the current H5N1 outbreak?**

H5N1 virus does not usually infect people, but more than 200 human cases have been reported. Most of these cases have occurred from direct or close contact with infected poultry or contaminated surfaces; however, a few cases of human-to-human spread of H5N1 virus have occurred.

So far, spread of H5N1 virus from person to person has been rare, limited and unsustainable. Nonetheless, because all influenza viruses have the ability to change, scientists are concerned that H5N1 virus one day could be able to infect humans and spread easily from one person to another. Because these viruses do not commonly infect humans, there is little or no immune protection against them in the human population.

If H5N1 virus were to gain the capacity to spread easily from person to person, an [influenza pandemic](#) (worldwide outbreak of disease) could begin. No one can predict when a pandemic might occur. However, experts from around the world are watching the H5N1 situation in Asia and Europe very closely and are preparing for the possibility that the virus may begin to spread more easily from person to person.

**How is infection with H5N1 virus in humans treated?**

Most H5N1 viruses that have caused human illness and death appear to be resistant to amantadine and rimantadine, two antiviral medications commonly used for treatment of patients with influenza. Two other antiviral medications, oseltamivir and zanamivir, would probably work to treat influenza caused by H5N1 virus, but additional studies are needed to demonstrate their current and ongoing effectiveness.

**Is there a vaccine to protect people from some strains of the H5N1 virus?**

Yes. On April 17, 2007, the U.S. Food and Drug Administration (FDA) announced its approval of the first vaccine to prevent human infection with one strain of the avian influenza (bird flu) H5N1 virus. The vaccine, produced by sanofi pasteur, Inc., has been purchased by the federal government for the U.S. Strategic National Stockpile; it will be distributed by public-health officials if needed. This vaccine will not be made commercially available to the general public. Other H5N1 vaccines are being developed by other companies against different H5N1 strains. For more information about the sanofi pasteur, Inc. vaccine, visit <http://www.fda.gov/bbs/topics/NEWS/2007/NEW01611.html>. For information about other H5N1 and pandemic flu vaccine research activities visit <http://www.pandemicflu.gov/research/index.html#vresearch>.

**What is the benefit of the FDA-approved H5N1 vaccine produced by sanofi pasteur Inc?**

The H5N1 vaccine approved by the U.S. Food and Drug Administration (FDA) on April 17, 2007, was developed as a safeguard against the possible emergence of an H5N1 pandemic virus. However, since the H5N1 virus is not a pandemic virus since it does not transmit efficiently from person to person, the H5N1 vaccine is being held in stockpiles rather than being used by the general public. This vaccine aids H5N1 preparedness efforts in case an H5N1 pandemic virus were to emerge.

**What does CDC recommend regarding H5N1 virus?**

In February 2004, CDC provided U.S. public health departments with recommendations for enhanced surveillance ("detection") of H5N1 influenza in the country. Follow-up messages, distributed via the Health Alert Network, were sent to the health departments on August 12, 2004, February 4, 2005, and June 7, 2006; all three notices reminded public health departments about recommendations for detecting (domestic surveillance), diagnosing, and preventing the spread of H5N1 virus. The notices also recommended measures for laboratory testing for H5N1 virus. To read these notices, visit [Health Updates on Avian Influenza](#).

**Does CDC recommend travel restrictions to areas with known H5N1 outbreaks?**

CDC does not recommend any travel restrictions to affected countries at this time. However, CDC currently advises that travelers to countries with known outbreaks of H5N1 influenza avoid poultry farms, contact with animals in live food markets, and any surfaces that appear to be contaminated with feces from poultry or other animals. For more information, visit [Travelers' Health](#).

**Is there a risk in handling feather products that come from countries experiencing outbreaks of avian influenza A (H5N1)?**

The U.S. government has determined that there is a risk to handling feather products from countries experiencing outbreaks of H5N1 influenza.

There is currently a ban on the importation of birds and bird products from H5N1-affected countries in Africa, Asia, and Europe. The [regulation](#) states that no person may import or attempt to import any birds (Class Aves), whether dead or alive, or any products derived from birds (including hatching eggs), from the specified countries (see [Embargo of Birds from Specified Countries](#)). This prohibition does not apply to any person who imports or attempts to import products derived from birds if, as determined by federal officials, such products have been properly processed to render them noninfectious so that they pose no risk of transmitting or carrying H5N1 and which comply with the U.S. Department of Agriculture (USDA) requirements. Therefore, feathers from these countries are banned unless they have been processed to render them noninfectious. Additional information about the import ban is available on the USDA website.

**Is there a risk to importing pet birds that come from countries experiencing outbreaks of avian influenza A (H5N1)?**

The U.S. government has determined that there is a risk to importing pet birds from countries experiencing outbreaks of H5N1 influenza. CDC and USDA have both taken action to ban the importation of birds from areas where H5N1 has been documented. There is currently a ban on the importation of birds and bird products from H5N1-affected countries in Africa, Asia, and Europe. The regulation states that no person may import or attempt to import any birds (Class Aves), whether dead or alive, or any products derived from birds (including hatching eggs), from the specified countries (see [Embargo of Birds from Specified Countries](#)).

**Can a person become infected with avian influenza A (H5N1) virus by cleaning a bird feeder?**

There is no evidence of H5N1 having caused disease in birds or people in the United States. At the present time, there is no risk of becoming infected with H5N1 virus from bird feeders. Generally, perching birds (Passeriformes) are the predominate type of birds at feeders. While there are documented cases of H5N1 causing death in some Passeriformes (e.g., house sparrow, Eurasian tree-sparrow, house finch), in both free-ranging and experimental settings, none occurred in the U.S. and most of the wild birds that are traditionally associated with avian influenza viruses are waterfowl and shore birds.

## Influenza Pandemic Preparedness

**What changes are needed for H5N1 or another avian influenza virus to cause a pandemic?**

Three conditions must be met for a pandemic to start: 1) a new influenza virus subtype must emerge for which there is little or no human immunity; 2) it must infect humans and causes illness; and 3) it must spread easily and sustainably (continue without interruption) among humans. The H5N1 virus in Asia and Europe meets the first two conditions: it is a new virus for humans (H5N1 viruses have never circulated widely among people), and it has infected more than 190 humans, killing over half of them.

However, the third condition, the establishment of efficient and sustained human-to-human transmission of the virus, has not occurred. For this to take place, the H5N1 virus would need to improve its transmissibility among humans. This could occur either by "reassortment" or adaptive mutation.

Reassortment occurs when genetic material is exchanged between human and avian viruses during co-infection (infection with both viruses at the same time) of a human or another mammal. The result could be a fully transmissible pandemic virus—that is, a virus that can spread easily and directly between humans. A more gradual process is adaptive mutation, where the capability of a virus to bind to human cells increases during infections of humans.

#### **What is CDC doing to prepare for a possible H5N1 influenza pandemic?**

CDC is taking part in a number of pandemic prevention and preparedness activities, including the following:

- Providing leadership to the National Pandemic Influenza Preparedness and Response Task Force, created in May 2005 by the Secretary of the U.S. Department of Health and Human Services.
- Working with the Association of Public Health Laboratories on training workshops for state laboratories on the use of special laboratory (molecular) techniques to identify H5 viruses.
- Working with the Council of State and Territorial Epidemiologists and others to help states with their pandemic planning efforts.
- Working with other agencies, such as the Department of Defense and the Veterans Administration, on antiviral stockpile issues.
- Working with the World Health Organization (WHO) to investigate influenza H5N1 among people (e.g., in Vietnam) and to provide help in laboratory diagnostics and training to local authorities.
- Performing laboratory testing of H5N1 viruses.
- Starting a \$5.5 million initiative to improve influenza surveillance in Asia.
- Holding or taking part in training sessions to improve local capacities to conduct surveillance for possible human cases of H5N1 and to detect influenza A H5 viruses by using laboratory techniques.
- Developing and distributing reagent kits to detect the currently circulating influenza A H5N1 viruses.
- CDC has developed and is distributing the first FDA approved test for the detection of the H5 viruses that first emerged in Asia in 2003.

CDC also is working closely with WHO and the National Institutes of Health on safety testing of vaccine candidates and development of additional vaccine virus seed candidates for influenza A (H5N1) and other subtypes of influenza A viruses.

## **Avian Influenza Infection in Animals**

#### **What animals can be infected with avian influenza A (H5N1) viruses?**

In addition to humans and birds, we know that pigs, tigers, leopards, ferrets, and domestic cats can be infected with avian influenza A (H5N1) viruses. In addition, in early March 2006, Germany reported H5N1 infection in a stone marten (a weasel-like mammal). The avian influenza A (H5N1) virus that emerged in Asia in 2003 is evolving and it's possible that other mammals may be susceptible to infection as well. CDC is working closely with domestic and international partners to continually monitor this situation and will provide additional information to the public as it becomes available.

#### **Can domestic cats be infected with avian influenza viruses?**

While domestic cats are not usually susceptible to influenza type A infection, it is known that they can become infected and die (both experimentally and naturally) with avian influenza A (H5N1) viruses and, in a laboratory/research setting can spread the virus to other cats. It is not known whether domestic cats can spread the virus to other domestic cats under natural conditions.

#### **How do cats become infected with avian influenza A (H5N1) viruses?**

All of the cases of influenza A (H5N1) infection in domestic cats reported to date have been associated with H5N1 outbreaks among domestic poultry or wild birds and are thought to have occurred by the cat eating raw infected birds.

#### **How commonly have cats been infected with avian influenza A (H5N1) viruses?**

During the avian influenza A (H5N1) outbreak that occurred from 2003 to 2004 in Asia, there were only several unofficial reports of fatal infections in domestic cats. Studies carried out in the Netherlands and published in 2004 showed that housecats could be infected with avian influenza A (H5N1) and could spread the virus to other housecats. In these experiments, the cats became sick after direct inoculation of virus isolated from a fatal human case, and following the feeding of infected raw chicken. In February 2006, Germany reported that a domestic cat had died from influenza A (H5N1) infection. That cat lived in the northern island of Ruegen, where more than 100 wild birds are believed to have died of the disease. The cat probably got sick by eating an infected bird.

**What about infection in large cats, like tigers?**

Large cats kept in captivity have been diagnosed with avian influenza as well. In December 2003, two tigers and two leopards that were fed fresh chicken carcasses from a local slaughterhouse died at a zoo in Thailand. An investigation identified avian influenza A (H5N1) in tissue samples. In February and March 2004, the virus was detected in a clouded leopard and white tiger, respectively, both of which died in a zoo near Bangkok. In October 2004, 147 of 441 captive tigers in a zoo in Thailand died or were euthanized as a result of infection after being fed fresh chicken carcasses. The cats are thought to have gotten sick from eating infected raw meat. Results of a subsequent investigation suggested that at least some tiger-to-tiger transmission occurred in that facility.

**Can cats spread H5N1 to people?**

There is no evidence to date that cats can spread H5N1 to humans. No cases of avian influenza in humans have been linked to exposure to sick cats, and no outbreaks among populations of cats have been reported. All of the influenza A (H5N1) infections in cats reported to date appear to have been associated with outbreaks in domestic or wild birds and acquired through ingestion of raw meat from an infected bird.

**What is the risk to humans or other species from cats infected with avian influenza H5N1 virus?**

There is no evidence to date that cats can spread H5N1 to humans. No cases of avian influenza in humans have been linked to exposure to sick cats, and no outbreaks among populations of cats have been reported. All of the influenza A (H5N1) infections in cats reported to date appear to have been associated with outbreaks in domestic or wild birds and acquired through ingestion of raw infected meat.

**What is the current risk that a cat in the United States will become infected with influenza A (H5N1)?**

As long as there is no influenza A (H5N1) in the United States, there is no risk of a U.S. cat becoming infected with this disease. The virus circulating in Asia, Europe and Africa has not yet entered the United States. CDC is working closely with domestic and international partners to continually monitor this situation and will provide additional information to the public as it becomes available.

**If avian influenza A (H5N1) is identified in the United States, how can I protect my cat?**

As long as there is no H5N1 influenza in the United States, at this time there is no risk of a U.S. cat becoming infected with this disease. In Europe, however, where H5N1 has been reported in wild birds, poultry, several cats, and a stone marten (a member of the weasel family), the [European Center for Disease Prevention and Control](#) has issued preliminary recommendations for cat owners living in H5N1-affected areas. Additionally, the Food and Agriculture Organization has produced guidance for areas where H5N1 HPAI has been diagnosed or is suspected in poultry or wild birds.

**Where can I find out more information about avian influenza infection in cats?**

For more information about avian influenza in cats, see [Avian influenza — Frequently asked questions \(from the American Veterinary Medical Association\)](#) and [H5N1 in Cats \(from the Food and Agriculture Organization of the United Nations\)](#).

**Can dogs be infected with avian influenza?**

While dogs are not usually susceptible to avian influenza viruses, the avian influenza A (H5N1) virus that emerged in Asia in 2003 has been documented to infect other carnivore species (e.g. cats, tigers, leopards, stone martens). This has raised concern that this strain of avian influenza A (H5N1) virus may be capable of infecting dogs. An unpublished study carried out in 2005 by the National Institute of Animal Health in Bangkok indicated that dogs could be infected with the virus, but no associated disease was detected. This limited information is not enough to determine definitively whether dogs are susceptible to the virus. CDC is coordinating with USDA, veterinary associations, and other partners domestically and internationally on this issue and will provide additional information to the public as it becomes available.

**How would dogs be infected with avian influenza A (H5N1)?**

There is not enough information available about avian influenza A (H5N1) infection in dogs to know how infection would occur. Affected domestic cats in Europe appear to have become infected by feeding upon raw infected poultry or wild birds. If dogs are susceptible to avian influenza A (H5N1), infection may be by the same route.

**What is the current risk that a dog in the United States will become infected with avian influenza A (H5N1)?**

As long as there is no influenza A (H5N1) in the United States, there is no risk of a U.S. dog becoming infected with this disease. The virus circulating in Asia, Europe and Africa has not yet entered the United States. CDC is working closely with domestic and international partners to continually monitor this situation and will provide additional information to the public as it becomes available.

**NOTE:** Answers to other questions can be found in the [Frequently Asked Questions \(FAQs\)](#) on the World Health Organization (WHO) website.

## **Appendix B**

### **Poultry Disease Advisory Committee Members**

Dr. David Marshall	NCDA&CS Veterinary Division
Dr. Sarah J. Mason	NCDA&CS Veterinary Division
Mrs. Sharron Stewart	NCDA&CS Emergency Programs
	Division
Dr Gene Erickson	NCDA&CS RADDL
Dr Eric Coleman	USDA APHIS VS
Dr. Jo Anna Quinn	USDA APHIS VS
Dr. H. John Barnes	NCSU CVM
Dr. Donna Carver	NCSU
Mr. Bob Pike	Braswell Milling
Dr. Shannon Jennings	Nash Johnson
Dr. Bill Hewat	Tyson Foods
Dr. David Rives	Prestage Farms
Mr. Richard Williams	Townsend's, Inc.
Dr. Rick Sharpton	Perdue Farms
Mr. Tom Yarboro	Goldsboro Milling
Dr. Don Ritter	Mountaire Farms
Mr. Mitch Zachary	Hubbard
Mr. Robert Ford	NC Poultry Federation
Mr. Gerald Allen	NC Gamefowl Breeders Association
Dr. Scott Westall	Pilgrim's Pride
Mr. Tommy Porter	Porter Farms, Inc.

## Appendix C

# Routine Surveillance of NC Birds for AI

(This section taken in part from National Avian Influenza Surveillance Plan, USDA, APHIS, June 29, 2007)

[http://www.aphis.usda.gov/vs/nahss/poultry/ai/avian\\_influenza\\_surveillance\\_plan\\_062907.pdf](http://www.aphis.usda.gov/vs/nahss/poultry/ai/avian_influenza_surveillance_plan_062907.pdf)

### A. National Poultry Improvement Plan

#### Egg-Type Chicken, Meat-Type Chicken, and Turkey Breeder Flocks

Active laboratory surveillance for AI in participating breeder flocks is presently conducted through the NPIP disease control provisions for breeding poultry as described in 9 CFR Part 145. The plan provides for a “U.S. Avian Influenza Clean” classification for table-egg layer breeding flocks in § 145.23(h) and for meat-type chicken breeding flocks in § 145.33(l). For turkey breeding flocks in § 145.43(g), the status of “U.S. H5/H7 Avian Influenza Clean” is awarded for participating flocks. These active surveillance programs are used to certify baby chicks, poults, and hatching eggs for interstate commerce or export from the United States. The plan identifies States, flocks, hatcheries, and dealers that meet certain disease control standards specified in the plan’s various programs. As a result, customers can buy poultry that have tested clean of certain diseases or were produced under appropriate disease-prevention conditions. Participation numbers for NPIP are published annually by the NPIP staff and presented to the United States Animal Health Association.

For primary breeder flocks, 30 birds per flock are tested at 4 months of age and then at 90-day intervals. For multiplier breeder flocks, 30 birds per flock are tested at 4 months of age and then at 180-day intervals (this requirement may change to 90 day intervals at the June, 2008 NPIP national meeting). Upon meeting program criteria, Avian Influenza Clean or H5/H7 Avian Influenza Clean status is awarded. Testing 30 birds per flock provides 95 percent confidence that AI is not present at a prevalence of 10 percent or greater (Cannon and Roe

1982). This assumes a test with perfect sensitivity, and either that birds are selected at random or the disease is randomly distributed throughout the flock.

### **Waterfowl, Exhibition Poultry, and Gamebird Breeder Flocks**

Surveillance for LPAI in breeding flocks for raised-for-release waterfowl, birds for exhibition and gamebirds is covered under 9 CFR Part 145.53, with participating flocks awarded “H5/H7 Avian Influenza Clean” classification. In waterfowl, exhibition, and gamebird primary breeder flocks, 30 birds per flock are tested at 4 months of age and then at 90-day intervals. Upon meeting program criteria, H5/H7 Avian Influenza Clean status is awarded. Testing 30 birds per flock provides 95 percent confidence that AI is not present at a prevalence of 10 percent or greater (Cannon and Roe 1982). This assumes a test with perfect sensitivity and the random selection of birds from the flock.

Pending the rulemaking process and public comments that are received, NPIP may be adding provisions covering AI testing in the raised-for-release and commercial waterfowl and gamebird industries. The proposed change was approved at the 38<sup>th</sup> Biennial Conference of the NPIP in September 2006. The proposed sectors to be covered are defined as:

- **Raised-for-Release Upland Gamebirds:** Pheasants, quail, and partridge that are raised under confinement for release in game preserves and are not breeding stock.
- **Raised-for-Release Waterfowl:** Waterfowl that are raised under confinement for release in game preserves and are not breeding stock.
- **Commercial Waterfowl or Commercial Upland Gamebirds:** Domesticated ducks or geese or pheasants, quail, and partridge grown under confinement for the primary purpose of producing meat for human consumption. The program proposes to add “H5/H7 Avian Influenza Monitored” status for raised-for-release upland gamebirds, raised-for-release waterfowl, commercial waterfowl, and commercial upland gamebirds. Once finalized, the regulations and surveillance program will appear in 9 CFR Part 146.53. For the raised-for release industries, 30 birds from the participating premises must be tested for the H5/H7 subtypes of AI every 90 days. For commercial waterfowl and upland gamebirds, participating slaughter plants will test 11 birds per shift for H5/H7 subtypes of AI; alternatively, they can test 11 samples within 21 days prior to slaughter

or have an ongoing active and passive surveillance program approved by the Official State Agency and APHIS.

North Carolina is participating in testing of raised-for-release upland gamebirds through a cooperative agreement with USDA APHIS. In this program, the birds are tested quarterly for AI, 30 samples per flock.

## **Commercial Meat and Egg Production Flocks: Interim Rule Published September 26, 2006**

NPIP has amended the regulations to establish a voluntary program for the control of the H5/H7 subtypes of LPAI in commercial poultry, adding a new Part 146 in 9 CFR. Participation in the new NPIP LPAI H5/H7 control program for the commercial industry will continue to be voluntary. The control program consists of three aspects: active surveillance, passive surveillance and initial State response and containment plans for H5/H7 LPAI. The active surveillance portion of the program (9 CFR Part 146, LPAI H5/H7 Voluntary Control Program) includes testing in commercial table-egg layer, meat-type chicken (broiler) flocks, and meat-type turkeys.

For commercial table-egg layer flocks in North Carolina, 11 birds or eggs per house are tested once quarterly, for commercial table-egg premises with more than 75,000 birds. For commercial broiler flocks, 11 birds per flock are tested at slaughter, or 11 samples no more than 21 days prior to slaughter for meat-type chickens associated with a plant that slaughters at least 200,000 birds per week. For commercial turkey flocks, 60 birds with respiratory signs from flocks over 10 weeks of age are tested monthly at federally inspected plants that slaughter more than 2 million birds annually. (In North Carolina, many companies now test 6 birds per flock, no more than 21 days prior to slaughter.) Upon meeting program criteria, H5/H7 Avian Influenza Monitored status is awarded. An 11-bird sample provides 95 percent confidence that AI is not present in the population at a prevalence of 25 percent or greater (Cannon and Roe 1982). This assumes a test with perfect sensitivity, and either that birds are selected at random or that the disease is randomly distributed throughout the flock.

Prior to recent publication of the NPIP regulations noted above, the National Chicken Council initiated a voluntary broiler program. Currently, 37 companies are sampling and testing all of their meat-type chicken flocks within 2 weeks prior to slaughter. This represents approximately 98 percent of U.S. broiler production. With the publication of the NPIP H5/H7 LPAI program, the companies will participate under NPIP to leverage the international reputation of NPIP. We expect that at least 90 percent of commercial poultry operations that meet the size standards will participate. This is similar to the participation level in the current programs for breeding flocks, in which we have a nearly 100 percent participation level from chicken and turkey companies. With the proposed surveillance levels, a 90 percent participation rate would

accomplish the program's goals.

All NPIP testing is conducted in NPIP authorized laboratories, which in North Carolina are State-affiliated or private/industry laboratories. All NPIP-authorized laboratories are required to report testing data to the official State agency by which they are authorized. USDA's National Veterinary Services Laboratories diagnosticians promptly report positive laboratory findings for NAI to State and Federal regulatory officials.

States receiving NPIP cooperative funding for LPAI submit quarterly reports to APHIS' Veterinary Services regional offices. These reports provide summarized flock testing data for certain NPIP programs (i.e., number of participating table-egg layer flocks; meat-type chicken and turkey slaughter plants; egg and meat-type chicken breeding flocks; turkey breeding flocks; waterfowl, exhibition poultry, and gamebird breeding flocks; number of samples collected and tested; and number of inspections.) Official State agencies report flock testing data annually to the NPIP national office, where an APHIS data collection system is maintained. Currently, the official State agencies overseeing the program maintain surveillance data for poultry tested through the NPIP program.

## **B. Prevention and Control of H5 and H7 LPAI in the LBMS**

Nationally, surveillance occurs in each of the three components of the LBMS: the production flocks, the distribution system, and the live-bird markets. AGID or RRT-PCR methodology is used to test samples from production flocks. RRT-PCR or virus isolation (VI) is used to evaluate specimens collected from birds in the distribution and marketing components of the system. VI is used for environmental samples (Table 5). In North Carolina, environmental and bird samples are obtained from production flocks, haulers and small sales. Production flocks are sampled monthly with 30 birds tested. Vehicles used to haul flocks to market are tested quarterly, 15 samples per vehicle. At small sales tested at least quarterly, 25 samples are obtained from random flocks, with at least 5 birds per flock tested when possible.

Environmental samples are obtained as well. Testing and reporting of results is identical to NPIP testing.

## **C. Backyard Poultry**

Backyard flocks are those flocks not included in the populations of high-volume or small-volume commercial poultry (backyard poultry flocks which choose to participate in NPIP in NC are monitored under that program), exhibition flocks or flocks who volunteer to act as Sentinel Flocks for AI in NC. Backyard poultry flocks are presumed to be at greater risk of acquiring NAI because husbandry practices associated with such flocks may increase the likelihood of

environmental exposure to NAI. Furthermore, backyard poultry flocks may be more likely to transmit NAI to other flocks via movement of birds from these premises.

In general, backyard flocks are monitored for AI upon owner request or disease calls made by the field staff. Sentinel flocks are located throughout the state in areas near commercial poultry or waterfowl congregation areas. These birds are tested quarterly, 12 samples per flock, by rRT-PCR. Samples and data are handled as explained for NPIP samples.

## D. Migratory Waterfowl and Shorebirds

The North Carolina Wildlife Resources Commission routinely investigates mortality events of wildlife including wild birds. There are no established guidelines regarding when an employee will make a field investigation of an event, but factors influencing that decision include: number of affected animals, duration of event and availability of fresh specimens. In general, agency personnel do not make field investigations of wild bird mortality events if only a few birds are involved and especially if fresh specimens cannot be obtained. If specimens are obtained, field personnel may submit them to one of several diagnostic labs including the NCDA-Rollins Lab, Southeastern Cooperative Wildlife Disease Study (SCWDS) and National Wildlife Health Center. Testing of specimens for avian influenza would normally be conducted in all instances.

### Avian Influenza Testing, 2003-2007 through SCWDS

From 2003 – 2007, the NCWRC provided cloacal swab samples from hunter-killed and live-trapped waterfowl to SCWDS for avian influenza testing. The primary purpose was to learn more about prevalence rates in wild waterfowl and pen-reared mallards. Diagnostic work was supported through a cooperative agreement with the Southeastern Poultry Disease Laboratory, Agricultural Research Service, United States Department of Agriculture. General results of this effort are presented in Table 1. Collection of samples for this project ended in winter 2006-07.

### Avian Influenza Testing, 2006-current through U.S.D.A.

Starting in winter 2006-07, the NCWRC has cooperated in [An Early Detection System for Highly Pathogenic H5N1 Avian Influenza in Wild Migratory Birds-U.S. Interagency Strategic Plan](#). This is a cooperative venture working with U.S.D.A. – Wildlife Services. The expressed goal of the Strategic plan and accompanying Implementation Plan is for the early detection of HPAI in wild, migratory birds. Funding from U.S.D.A. to state wildlife agencies is carried out through cooperative agreements. In North Carolina, samples have been collected from waterfowl obtained through hunter harvest, live-trapping or morbidity/mortality events. In addition, fecal samples from waterfowl deposited in agricultural fields are obtained through the “environmental sampling” collection strategy. Table 1 provides summary collection information from work accomplished by the North Carolina Wildlife Resources Commission only. The [National Biological Information Infrastructure](#) website provides a detailed listing of the nationwide sampling effort.

Table 1. Sampling effort and summary information of avian influenza testing of waterfowl samples collected by the North Carolina Wildlife Resources Commission.

Year & program	Samples collected	# AI positives	comments
2003-2007 (SCWDS)	3,411	16 (0.5%)	
2006-current (USDA)	1,333	unknown	No HP H5N1 detected
Total	4,744		

## Appendix D



# Guidelines for In-House Composting Poultry Mortality as a Rapid Response to Avian Influenza

Virginia Cooperative Extension

*Knowledge for the Commonwealth*

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### SUMMARY OF THE METHOD

- Summary of Method
- Advantages of In-House Composting
- Planning Prior to an Outbreak
- Equipment and Supplies
- Protocols
  - Prior to Euthanizing the Flock
  - Euthanizing the Flock
  - Constructing the Windrow
  - Breeder Houses
  - Double-Deck Houses
- Temperature Monitoring
- Aerating the Windrow
- Testing for Virus
- Removing the Compost from Poultry House
- Troubleshooting
- Temperature Log
- List of References

Composting is the natural degradation of organic resources (such as poultry carcasses) by microorganisms. Research in Maryland, Delaware, and North Carolina indicates that composting is effective in killing a variety of diseases including avian influenza (AI). In-house composting was successfully used in Delaware and Maryland to control an outbreak of AI. Current research in Virginia indicates that in-house composting can be effective with most bird types and poultry house designs.

Lu et al. (2003) reported that Avian Influenza Virus (AIV) can be inactivated in 10 minutes at 140°F (60°C) or 90 minutes at 133°F (56°C). Microbial activity within a well-constructed compost pile can generate and maintain temperatures ranging from 130°F to 150°F (54°C to 66°C) for several weeks, which is sufficient to inactivate the AI virus with generous margins of error.

### ADVANTAGES OF IN-HOUSE COMPOSTING

- Contains the disease and limits off-farm disease transmission
- Limits the risks of groundwater and air pollution
- Inactivates pathogens in carcasses and litter
- Limits public concerns over disease exposure
- Relative low cost and uses readily available farm equipment
- Protected from severe weather conditions (frozen ground, etc.)

### PLANNING PRIOR TO AN OUTBREAK

- Additional sources of carbon material should be identified and secured to ensure availability.
- Rapid Response Teams, with team leaders and alternates, should be created within each poultry complex to oversee sanitation, depopulation, and in-house composting.
- Rapid Response Team training should include respirator fit testing.
- Worker decontamination plans and equipment should be prepared.
- Movement of carcasses in the houses and equipment brought onto the farm should be limited.
- In-house composting can be done in most poultry houses. Where not possible, composting outside the poultry house using a breathable compost cover or fleece would be an alternative.
- Variations in house designs may require adaptations to euthanasia and windrow construction methods outlined in this fact sheet.

**“Research indicates that Avian Influenza Virus (AIV) can be inactivated in 10 minutes at 140°F (60°C) or 90 minutes at 133°F (56°C) (Lu et al., 2003).”**

**IN-HOUSE COMPOSTING FACT SHEET**

*A demonstration project of in-house composting of turkeys conducted in Virginia in 2005 showed that tilling and crushing the carcasses increased temperature and decreased downtime by 3 and 11 days respectively.*



**EQUIPMENT AND SUPPLIES**

- Skid steer loader(s), tiller attachment, hay spear, and scoops
- Sawdust, litter, woodchips, or other carbon material
- Compost thermometers (36" or 48" stem length) or wireless/wired temperature probes
- Power washer, disinfecting equipment and recommended disinfectants

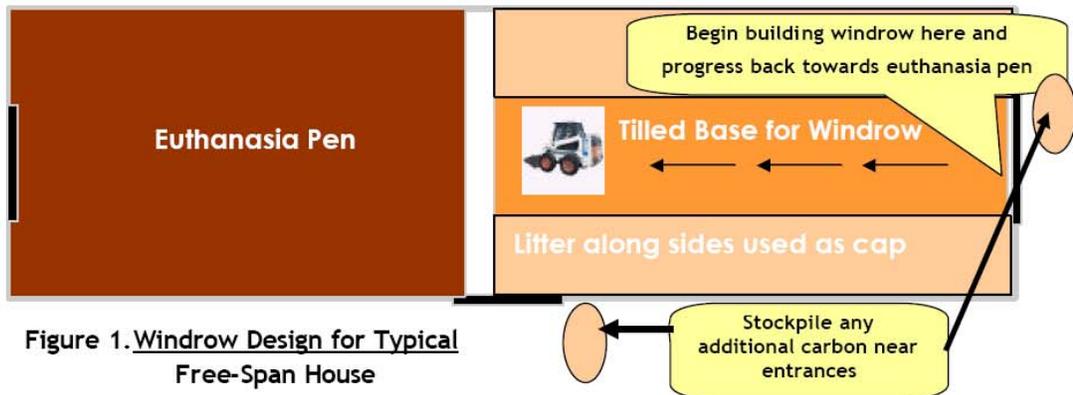
**PROTOCOLS**

Prior to euthanizing the flock

- Ensure that all personnel have appropriate personal protective equipment and training.
- Turn off fans, close curtains, raise poultry feeders, and waterers.
- Effective in-house composting must have a minimum of 1.5 pounds of carbon material (based a 30 lbs/cubic foot material) per pound of bird. (1 lb. of carbon per lb. of bird in the mix and the remaining carbon for cap and cover.)
- Determine total pounds (lbs.) of birds
  - lbs. birds = number of birds X average weight in lbs.
- Determine pounds of litter in house
  - cubic feet of litter = length of house X width of house X depth of litter (in feet)
  - lbs. litter = cubic feet of litter X weight of a cubic foot of litter (Average = 30 lbs; Range = 25 to 35 lbs.)
- Determine amount of additional carbon needed
  - total lbs. carbon needed = lbs. birds X 1.5
  - Cubic yards of additional carbon needed = (total lbs. carbon needed – lbs. litter in house)/(weight per cubic ft. of carbon material)/(27)
    - woodchips, litter or wet sawdust = 30 lbs./cubic ft.
    - dry sawdust = 15 lbs./cubic ft. (due to low density, volume can be reduced by 50%)
- Mobilize euthanasia, composting, and sanitation crews.

Euthanizing the flock

- Birds may be confined to a portion of the house for euthanasia (see Figure 1). If whole-house euthanasia methods are used, windrow construction procedures will differ.



**Figure 1. Windrow Design for Typical Free-Span House**

**IN-HOUSE COMPOSTING FACT SHEET** **Page 3**

**Euthanizing the flock (continued)**

- Breeder and double-deck houses require alternate windrow designs.
- Unload additional carbon material (if needed) near doors so it is accessible during windrow construction.
- Follow industry guidelines for humane euthanasia.



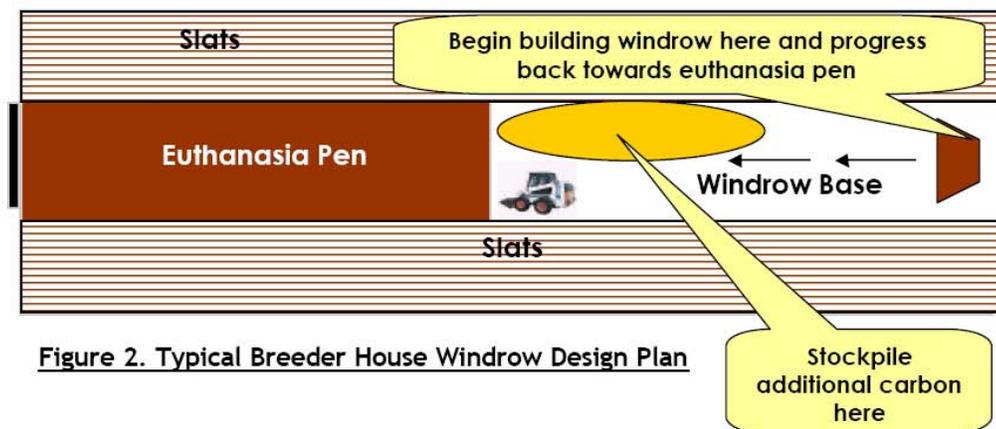
**Construction of Windrows in Free-Span Houses**

- Till caked litter in the house to form a good base (4-6 inches) for the windrow (avoid compacting windrow base with equipment traffic).
- Use the skid loader and/or tractor to crush the birds within the euthanasia pen.
- Place any remaining feed on top the birds.
- Begin mixing birds and litter from the euthanasia end of the poultry house alternating 1 loader bucket of birds with 2 bucket of litter/carbon.
- Using the skid loader, begin constructing the windrow with the bird/litter mix on the filled base at the other end of the poultry house (see Figure 1).
- The windrow should be 4 to 6 feet high and 12 feet wide.
- As the windrow is being constructed, cap with 4 to 6 inches of litter from the sides of the windrow.
- Continue this process until all of the bird/litter mix has been added to the windrow.
- Any remaining litter should be used to cap the windrow.



**Considerations for Breeder Houses**

- All operations must occur within the 13-foot scratch area between the slats (see Figure 2).
- Base should be a minimum of 4 to 6 inches.
- Compost piles should be constructed 4 to 6 feet high, if possible, and capped as the windrow is constructed.
- Once windrow construction begins, no additional equipment or supplies will be accessible until all birds have been added to the windrow because the skidloader will be confined to the middle of the house.



**Figure 2. Typical Breeder House Windrow Design Plan**

**IN-HOUSE COMPOSTING FACT SHEET** **Page 4**



*“Composting is the natural degradation of organic resources (such as poultry carcasses) by microorganisms.”*

**Considerations for Double-Deck Houses**

- Euthanize birds both upstairs and downstairs.
- Crush birds downstairs with skid loader.
- Establish a minimum of a 4 to 6 inch base.
- Begin composting downstairs by mixing birds and litter; build the first windrow in the side alley of the building (see Figure 3).
- If there is sufficient height, the windrows can be capped after both are constructed, otherwise, they should be capped as constructed.
- Using a small tractor, push only enough birds and litter from upstairs down through the trap doors that can be crushed effectively prior to placing in the next windrow.
- The windrow for the birds and litter from upstairs should be started in the opposite side alley (see Figure 3).
- Alternate pushing birds and litter downstairs, crushing and mixing, and forming the windrow until all birds and litter from the upstairs have been added to the windrow.
- If not capped during construction, cap the windrows with litter or other carbon source so no carcasses are exposed.

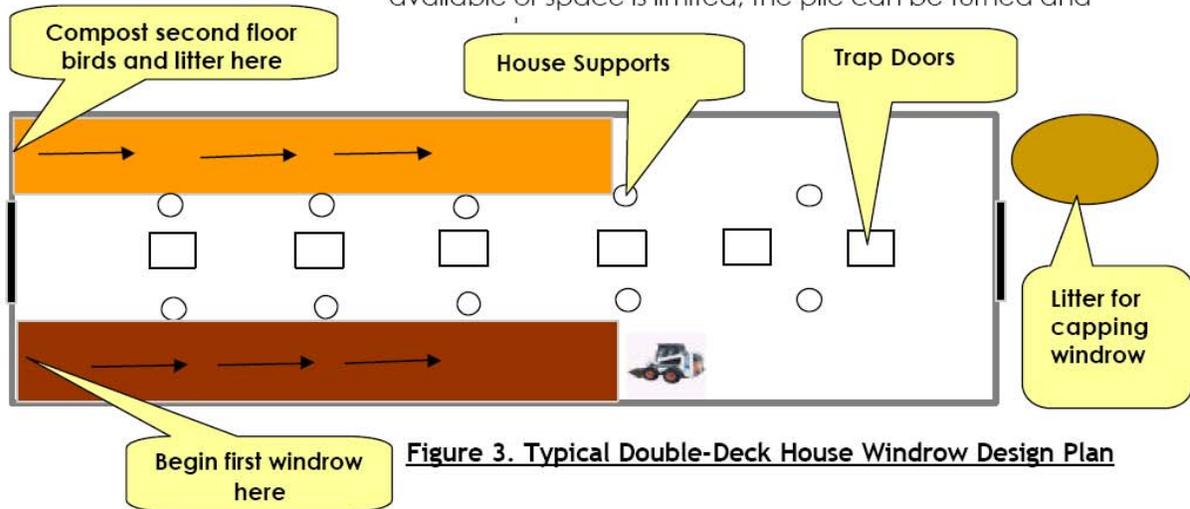
**TEMPERATURE MONITORING**

- Temperatures within the center of the compost piles should be regularly monitored at 25 to 50 foot intervals the length of the windrow and charted. See sample log on page 6.
- Remote temperature monitoring is preferable for biosecurity and worker safety.
- Windrow temperatures should reach at least 130° F within the first week (see Figure 4).



**AERATING THE WINDROW**

- If the windrow temperature peaks and drops below 105° F within the first two weeks, it should be aerated by slowly lifting with a hay spear along the length of the pile. This method does not disturb the cap and allows oxygen into the pile. If a fork is not available or space is limited, the pile can be turned and

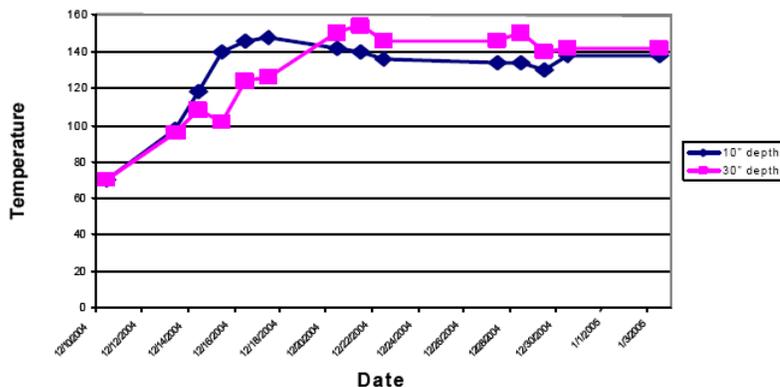


**Figure 3. Typical Double-Deck House Windrow Design Plan**

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**TESTING FOR VIRUS**

- Virus isolation testing should be conducted after 2 weeks.



**Figure 4. Representative Temperature Graph for Windrow Composting**

**REMOVING THE COMPOST FROM THE POULTRY HOUSE**

- Temperatures should be regularly monitored after construction to ensure inactivation of virus.
- 3 to 4 weeks after construction of windrow, the material within the pile should be inspected to evaluate the decomposition of the carcasses. At this stage, carcasses should be reduced to bones and feathers with little flesh remaining.
- If inspection confirms the near complete decomposition of all fleshy material and virus isolation results (per USDA or State Veterinarian protocol) have come back negative, the compost can be removed from the poultry house and deep stacked in a litter storage shed or on an appropriate site covered with a compost fleece for additional curing.
- A sample should be collected and submitted for nutrient analysis.
- Upon receipt of litter analysis and subject to quarantine release by the State Veterinarian the compost may be land applied at agronomic rates.
- A transportation subsidy of \$10 per ton may be necessary to facilitate the movement and distribution of the compost and overcome the stigma associated with material originating from an AI positive farm.

**TROUBLESHOOTING**

<b>Problem</b>	<b>Issue</b>	<b>Solution</b>
Excessive flies or odor	Exposed carcasses	Add additional cap material
Leachate from windrow	Mixture too wet	Add additional carbon material, mix and cap
Temperature does not reach 135°F	Mixture too dry (< 40% moisture)	Add water to pile, mix if necessary
Temperature does not reach 135°F	Mixture too wet (> 60 % moisture)	Add additional carbon material, mix if necessary
Temperature drops early	Not enough oxygen	Aerate or mix pile



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# Appendix E

## Protecting Poultry Workers from Avian Influenza



### Protecting Poultry Workers from Avian Influenza (Bird Flu)

#### WARNING!

During an outbreak of avian influenza (bird flu), poultry workers\* may become seriously ill or die after contact with infected poultry or contaminated materials.

All poultry workers and all owners and operators of poultry operations should take the following steps to protect themselves from avian influenza:

#### Take the following steps BEFORE an outbreak of avian influenza:

1. Make sure that an avian influenza response plan has been developed to complement regional, State, and industry plans.
  - Use the CDC guidance presented in the full Alert to develop a response plan.
  - Select a response plan manager.
  - Coordinate your avian influenza response plan with appropriate State animal and public health agencies.
  - Make sure that workers are aware of the avian influenza response plan and their responsibilities.
2. Follow biosecurity practices to keep avian influenza and other diseases out of your poultry flock:

- Keep your poultry flock isolated from outside environments.
- Prevent flocks from contacting wild birds and water sources that might be contaminated by wild birds.
- Allow only essential workers and vehicles to enter the farm and poultry houses.
- Provide clean protective clothing, equipment, and disinfection facilities for workers.
- Thoroughly clean and disinfect equipment and vehicles entering and leaving the farm. Include tires and undercarriage.
- Do not borrow equipment or vehicles from other farms and do not lend yours.
- Avoid visiting other poultry farms.
- If you do visit another farm or a live-bird market, change footwear and clothing before contacting your own flock again.

\*Poultry workers include all workers who may contact poultry or materials or environments contaminated by poultry.



- Do not bring birds from slaughter channels (especially live-bird markets) back to the farm.
3. Know the signs of avian influenza in poultry.
    - Be aware of the signs of avian influenza infection with the highly pathogenic H5N1 virus in poultry:
      - Sudden death without clinical signs or symptoms
      - Lack of coordination
      - Lack of energy and appetite
      - Soft-shelled or misshapen eggs
      - Decreased egg production
      - Purple discoloration of the wattles, combs, and legs
      - Swelling of the head, eyelids, combs, wattles, and hocks
      - Diarrhea
      - Nasal discharge
      - Coughing and sneezing
  4. Report sick or dying birds immediately!
    - Immediately report any sick or dying birds in your poultry flock to the proper authorities:
      - Call the U.S. Department of Agriculture (USDA) toll free at 1-866-536-7593.
      - Or contact your State veterinarian or local extension agent.
  5. Know the possible signs and symptoms of avian influenza in humans infected with the highly pathogenic H5N1 virus:
    - Don't wait to report sick birds! Early detection of avian influenza is essential to prevent its spread.
    - Fever
    - Cough
    - Shortness of breath
    - Sore throat
    - Muscle aches
    - Conjunctivitis (redness, swelling, and pain in the eyes and eyelids)
    - Diarrhea
  6. Consider getting the current season's flu shot.
  7. Train workers in all guidance and recommendations presented in this Alert.

**Take the following steps DURING an outbreak of avian influenza:**

1. Follow the avian influenza response plan.
2. Ask your doctor about taking antiviral medication.
3. Wear personal protective clothing.
  - Wear the following personal protective clothing if you may be exposed to an avian influenza virus:
    - Outer garments (aprons or coveralls)
    - Gloves

(Continued)



- Foot protection (boots or boot covers)
  - Head protection (head cover or hair cover)
  - Choose disposable, impermeable, lightweight protective clothing.
  - Wear disposable, lightweight, waterproof gloves (8- to 12-mil nitrile or vinyl, for example) or heavy-duty, 18-mil rubber gloves that are reusable after disinfection.
  - Use disposable boot covers or boots that can be reused after disinfection.
  - Use disposable head covers or hair covers.
4. Wear eye protection.
- When working with poultry, wear unvented or indirectly vented safety goggles, a respirator with a full facepiece, or a powered, air-purifying respirator (PAPR) with a loose-fitting hood or helmet and face shield.
  - Remove eye protection carefully to prevent contaminated equipment from contacting eyes, nose, or mouth.
5. Wear respirators.
- Wear a NIOSH-approved, air-purifying respirator with a particulate filter whenever you are working in poultry barns or may be exposed to infected poultry or virus-contaminated materials or environments.
  - Use a particulate filter that is rated N-95 or better.
6. Follow a written respiratory protection program. To make sure that respirators protect workers adequately from avian influenza, do the following:
- Designate a qualified person to oversee the program and answer workers' questions.
  - Provide workers with respirator training and fit-testing to assure a safe and comfortable seal for the respirator facepiece.
  - Include all workers who may be at risk of exposure to avian influenza virus.
7. Protect yourself when removing personal protective clothing or equipment.
- With your respirator, goggles, and gloves on, remove all personal protective clothing.
    - Place disposable clothing in approved, secure containers<sup>1</sup> for disposal.
    - Place reusable clothing in approved, secure containers for cleaning and disinfection.
  - Remove gloves and discard them in an approved, secure container for biohazardous wastes.
    - Thoroughly wash hands with soap and water.
    - If no hand-washing facilities are available, use waterless soaps or alcohol-based sanitizers provided by your employer.

<sup>1</sup>Approved, secure containers should be (1) closable, (2) constructed to contain all contents and prevent leakage of fluids during handling, storage, transport, or shipping, (3) labeled or color-coded, and (4) closed before removal, in accordance with the OSHA standard in the Code of Federal Regulations [29 CFR 1910.1030(d)(4)(iii)(B)].



- Be careful about using waterless soaps or alcohol-based sanitizers too often, as they can be very harsh to the skin.
- Next, carefully remove your goggles and then your respirator.
  - Thoroughly wash hands again with soap and water.
  - If no hand-washing facilities are available, use waterless soaps or alcohol-based sanitizers provided by your employer.
- 8. Use good hand hygiene (proper use of gloves, hand-washing, and waterless hand sanitizers) and the decontamination procedures outlined here to prevent infection, avoid taking viruses home, and keep them from spreading to other fams.
- 9. Shower at the end of the work shift and leave all contaminated clothing and equipment at work.
  - Shower at the worksite or at a nearby decontamination station.
  - Never wear contaminated clothing or equipment outside the work area.
- 10. Participate in health surveillance and monitoring programs.
  - Make sure a surveillance program has been established to identify symptomatic workers for 10 days after exposure to infected birds or virus-contaminated materials or environments.
  - Seek immediate medical care for workers who develop any of the following symptoms within 10 days of exposure to infected or

exposed birds or to virus-contaminated materials or environments:

- Fever
- Cough
- Shortness of breath
- Sore throat
- Muscle aches
- Conjunctivitis (eye infections)
- Diarrhea
- Tell the health care provider about the possible avian influenza exposure before the ill person arrives.
- Promptly report suspected human cases to supervisors and to local health authorities.

For additional information, see *NIOSH Alert: Protecting Poultry Workers from Avian Influenza (Bird Flu)* [DHHS (NIOSH) Publication No. 2008-113]. To request single copies of the Alert, contact NIOSH at

1-800-CDC-INFO (1-800-232-4636)  
 TTY: 1-888-232-6348  
 E-mail: [cdcinfo@cdc.gov](mailto:cdcinfo@cdc.gov)

or visit the NIOSH Web site at [www.cdc.gov/niosh](http://www.cdc.gov/niosh)

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DEPARTMENT OF HEALTH AND HUMAN SERVICES  
 Centers for Disease Control and Prevention  
 National Institute for Occupational Safety and Health





## Protecting Poultry Workers from Avian Influenza (Bird Flu)

### WARNING!

During an outbreak of avian influenza (bird flu), poultry workers\* may become seriously ill or die after contact with infected poultry or contaminated materials.

The National Institute for Occupational Safety and Health (NIOSH) requests help in protecting poultry workers from infection with viruses that cause avian influenza (also known as bird flu). Although human infection with avian influenza viruses is rare, workers infected with certain types of these viruses may become ill or die.

Some types of avian influenza viruses can cause serious illness or death in poultry and other birds. These viruses are referred to as **highly pathogenic viruses**. Rarely, these viruses may be passed to humans who contact infected poultry or virus-contaminated materials or environments.

The following workers are at risk of infection with highly pathogenic avian influenza viruses:

- Poultry growers and their workers
- Service technicians of poultry growers

- Workers at egg production facilities (caretakers, layer barn workers, and chick movers)
- Veterinarians and their staff who work with poultry
- Disease control and eradication workers on poultry farms (State, Federal, contract, and poultry farm workers)

This Alert describes the following:

1. Avian influenza in humans
2. Avian influenza outbreaks in chickens
3. Recommendations for protecting poultry workers from avian influenza

Remember these facts:

- No avian influenza epidemic now exists in humans.
- Scientists are currently most concerned about the highly pathogenic

\*Poultry workers include all workers who may contact poultry or materials or environments contaminated by poultry.

avian influenza A virus known as H5N1. As of February 2008, all human cases of influenza caused by this virus have occurred outside the United States.<sup>1</sup>

- The avian influenza virus rarely infects humans.
- The avian influenza virus does not pass easily from person to person.

NIOSH requests that owners and operators of poultry operations follow the recommendations in this Alert and use the controls presented here.

NIOSH also requests that safety and health officials, editors of trade journals, labor unions, and employers bring the recommendations in this Alert to the attention of all poultry workers and poultry farm operators.

## BACKGROUND

### What is avian influenza?

Avian influenza is caused by influenza A viruses and occurs worldwide in many species of birds. For this reason, avian influenza is often referred to as "bird flu."

Avian influenza viruses normally reside in the intestinal tracts (guts) of water and shore birds, and they usually cause little if any disease. Only a few of these viruses can cause disease in other animals and in humans—for example, the highly pathogenic H5N1 and H7N7 viruses.

<sup>1</sup>For current information about outbreaks of avian influenza around the world, see [www.cdc.gov/flu/avian/outbreaks/current.htm](http://www.cdc.gov/flu/avian/outbreaks/current.htm).

Influenza A viruses are divided into two groups based on their pathogenicity (capacity to cause disease) to poultry:

- **Low-pathogenic avian influenza viruses**, which cause a mild disease or no noticeable signs of disease, and
- **Highly pathogenic avian influenza viruses**, which cause serious disease and high rates of death.

Scientists are currently most concerned about the highly pathogenic avian influenza A virus known as H5N1.<sup>2</sup> Although the H5N1 virus causes serious illness in birds, it has rarely infected humans.

The first known cases of human infection with H5N1 avian influenza occurred in 1997 in Hong Kong. Outbreaks of H5N1 avian influenza in poultry and some cases in humans began again in Asia in late 2003 and continue to be reported there. In addition, outbreaks in birds and humans have been reported in Africa, and outbreaks in birds have occurred in Europe. As of February 2008, no outbreaks in birds or humans have been reported in North, Central, or South America.

Avian influenza outbreaks from the H5N1 virus have occurred in birds in more than 50 countries and in humans in 12 countries (see WHO [2008] at [www.who.int/csr/disease/avian\\_influenza/en/](http://www.who.int/csr/disease/avian_influenza/en/)).

### Important avian influenza facts

Remember the following facts about the highly pathogenic H5N1 virus:

<sup>2</sup>In this document, H5N1 always refers to the highly pathogenic form of avian influenza virus.

- Most human infections with this virus have resulted from contact with infected poultry or virus-contaminated materials or environments.
- H5N1 virus rarely infects humans.
- When this virus does infect humans, it does not pass easily from person to person—that is, transmission between humans has not been efficient or sustained [DHHS 2006].
- As of February 2008, the H5N1 virus has not been detected in the United States.
- H5N1 virus can be spread from one location to another through
  - migrating birds (which may not show symptoms of disease) and
  - legal and illegal trade in poultry and other birds as well as their products.
- If the virus changes so that it can be easily passed from one person to another, it could cause a pandemic (worldwide) influenza outbreak in humans.

mild symptoms (such as ruffled feathers or a drop in egg production).

**2. What is the risk of infection to humans?**

Avian influenza viruses do not usually infect humans. However, 353 human cases of avian influenza A (H5N1) were reported to the World Health Organization (WHO) between late 2003 and January 24, 2008 [WHO 2008]. About 63% of these cases (221) were fatal. No human cases have been reported within North, Central, or South America.

H5N1 virus can be transmitted to people who contact infected poultry or virus-contaminated materials or environments. This type of transmission has not been frequent or sustained from one human to another.

Health risks related to human exposure to the low-pathogenic avian influenza viruses are poorly understood, but they are thought to be minimal. Only rare cases of human infection with low-pathogenic viruses have been reported. Nonetheless, anyone likely to have prolonged exposure to any avian influenza virus should take protective measures.

**FREQUENTLY ASKED QUESTIONS**

**1. How are poultry affected by avian influenza?**

Domestic poultry may be infected with either low-pathogenic or highly pathogenic viruses through contact with infected poultry, wild birds, or virus-contaminated materials or environments:

- Highly pathogenic avian influenza viruses spread quickly and may kill an entire poultry flock in 48 hours.
- Low-pathogenic avian influenza viruses may go unnoticed or cause only



Photograph courtesy of USDA.

Examples of workers at risk include the following:

- Poultry growers and their workers
- Service technicians of poultry growers
- Caretakers, layer barn workers, and chick workers at egg production facilities
- Veterinarians and their staff who work with poultry
- Workers involved in disease control and eradication on poultry farms (Federal, State, contract, and poultry farm workers)



**3. How is the virus passed to humans?**

Avian influenza virus is excreted in the droppings, saliva, and nasal secretions of infected birds. The virus is believed to enter humans through the mouth, nose, or eyes. Scientists believe that the virus is most often passed to humans from contact with infected poultry that was sick or dead. Contact with the following materials or equipment may also be a source of infection:

- Droppings
- Feathers

- Litter
- Egg flats
- Cages

For more information about human infection with avian influenza viruses, see [www.cdc.gov/flu/avian/gen-info/avian-flu-humans.htm](http://www.cdc.gov/flu/avian/gen-info/avian-flu-humans.htm).

**4. Why are scientists concerned about the H5N1 virus?**

Scientists are concerned about the H5N1 virus for the following reasons:

- H5N1 virus causes serious illness and death in poultry and therefore threatens domestic poultry throughout the world.
- This virus can cause serious illness and death in humans.
- If a strain of H5N1 changes so that it is highly infectious to humans and spreads easily from person to person, it could cause an influenza pandemic.

Public health authorities are monitoring outbreaks of human illness linked with avian influenza. To date, human infections with highly pathogenic avian influenza viruses identified since 1997 have not resulted in continued transmission from one person to another.

**REPORTED OUTBREAKS**

Current news about avian influenza deals mostly with human illness caused by the H5N1 virus. However, human infections have also been caused by other subtypes of avian influenza virus such as H7N7 and H7N3. The following reports describe outbreaks involving several subtypes of highly

pathogenic avian influenza virus. One report describes an outbreak in poultry alone, with no reported human cases.

#### **Report 1—Eighteen H5N1 human cases in Hong Kong, 1997**

An outbreak of H5N1 avian influenza occurred in humans and poultry in Hong Kong during 1997. This outbreak involved 18 confirmed human cases, including six deaths [Chan 2002].

The first human case occurred in May, soon after outbreaks in poultry were reported at three farms. Seventeen more human cases occurred in November and December after infected poultry were found in wholesale and retail markets. Many of the infected humans had visited either a retail poultry stall or a live poultry market before becoming ill [Mounts et al. 1999]. All chickens and other poultry in Hong Kong were culled (destroyed) to stop the outbreak. No additional human cases were detected during this outbreak after the culling operation was complete.

Commercial poultry cullers and workers were not included among the 18 cases described here. However, laboratory tests showed that about 3% of poultry cullers and 10% of poultry workers showed evidence of earlier infection with H5N1 virus [Bridges 2002].

#### **Report 2—Eighty-nine H7N7 human cases in the Netherlands, 2003**

In February 2003, a large outbreak of avian influenza was caused by the highly pathogenic H7N7 virus in commercial poultry farms in the Netherlands [Koopmans et al. 2004]. The infection spread to approximately 255 farms and resulted in the culling of all

infected flocks (about 30 million chickens). The virus may have been introduced to the commercial flocks by infected wild ducks.

At the time of the outbreak, local authorities believed the risk to humans was low. However, 89 human infections were identified, with health complaints primarily consisting of conjunctivitis. Mild, influenza-like illness was associated with the conjunctivitis in a few cases.

However, one human fatality occurred in a veterinarian who had not received antiviral medication but had spent a few hours screening flocks that were later confirmed to be infected with the H7N7 virus. The highest risk of infection was in veterinarians and workers who culled infected poultry.

The outbreak was brought under control in about 2 months by culling infected flocks. An outbreak-management response team advised all workers who screened and culled poultry to wear goggles and respirators to reduce their exposures to the avian influenza virus. The team recommended that vaccination with the current flu vaccine be made mandatory for all poultry farmers and their families within a 3-kilometer radius of infected farms. They stressed the importance of hand washing and personal hygiene at home. Immediate treatment with oseltamivir (Tamiflu<sup>®</sup>) was recommended for all new conjunctivitis cases and a preventive dose (75 mg daily) was started for all persons handling potentially infected poultry. This dose was continued for 2 days after the last exposure.

#### **Report 3—Two H7N3 human cases in Canada, 2004**

On February 19, 2004, the Canadian Food Inspection Agency announced an outbreak

of avian influenza in poultry from highly pathogenic H7N3 virus in the Fraser Valley region of British Columbia [Tweed et al. 2004; CDC 2006a]. Health Canada reported two cases of laboratory-confirmed H7N3 infections in humans. Both patients were poultry workers; one was involved in culling operations on March 13–14, 2004, and the other had close contact with poultry on March 22–23, 2004. Both patients developed conjunctivitis and other flu-like symptoms. Their illnesses resolved after treatment with antiviral medication (oseltamivir). Ten other poultry workers developed conjunctivitis symptoms and/or upper respiratory symptoms after contacting poultry. However, these infections were not laboratory-confirmed as H7N3 infections.

Culling operations by Federal workers and other measures were undertaken to control the spread of the virus. Authorities required personal protective equipment for all persons involved in culling activities. This equipment included N-95 respirators, gloves, goggles, biosafety suits, and footwear. Authorities also monitored compliance with prescribed safety measures. Epidemiologic, laboratory, and clinical surveillance was done for signs of avian influenza in exposed persons. However, no person-to-person transmission was detected during this outbreak.

#### **Report 4—H5N2 in poultry, Texas, 2004: no human cases**

In February 2004, an outbreak of avian influenza from highly pathogenic H5N2 virus was detected in a flock of 7,000 chickens in south-central Texas [Lee et al. 2005]. The chickens at the affected farm were being sold to live-bird markets in Houston. Approximately 1,700 chickens had been sold to the live-bird markets about a week before the laboratory confirmed avian influenza in

the flock. The flock was culled on February 21, 2004. No human infections were reported.

#### **Report 5—Eight H5N1 human cases in Indonesia, 2006**

Poultry in Indonesia and other nearby countries have suffered continuing outbreaks of illness from the H5N1 virus in 2006 and 2007. This virus is considered to be entrenched in poultry throughout much of Indonesia. This widespread presence of the virus and local conditions have resulted in a substantial number of human cases (102 cases since 2005).

In June 2006, Indonesia became the focus of media attention when H5N1 was identified in an outbreak involving eight members of an extended family in northern Sumatra [Butler 2006]. No samples were taken from the first patient, a 37-year-old woman who became ill on April 24 and died on May 4. However, samples from seven other family members confirmed the presence of H5N1 virus. Investigators assumed that the first patient was also infected with H5N1 virus (which she is thought to have contracted from infected poultry). In all, seven of the eight infected family members died. A 25-year-old brother of the first patient survived.

The outbreak was considered to be controlled on June 12, 2006—3 weeks after the death of the last victim—with no new cases reported. This cluster of H5N1 cases is the first instance in which WHO reported that human-to-human transmission may have occurred. Concerns over the cluster of cases have eased since no other large clusters of human cases have been identified.

## CONCLUSIONS

### Outbreaks in Birds

In birds, outbreaks of the H5N1 virus continue to spread in Europe, Asia, and Africa. These outbreaks are on a scale that has not been seen before. Continued worldwide spread of this virus will place poultry and poultry workers at increased risk of infection.

### Human cases

Since January 2003, WHO has published the numbers of confirmed human illnesses and deaths from the H5N1 virus. Between January 2003 and January 24, 2008, WHO reported 353 confirmed human cases of infection with H5N1 virus in 14 countries—Azerbaijan, Cambodia, China, Djibouti, Egypt, Indonesia, Iraq, Laos, Myanmar, Nigeria, Pakistan, Thailand, Turkey, and Vietnam [WHO 2008]. Of these cases, 221 (63%) were fatal.

In 2007, Indonesia reported 42 new human cases of avian influenza, followed by Egypt (25), Vietnam (8), China (5), Laos (2), Cambodia (1), Myanmar (1), Nigeria (1), and Pakistan (1) [WHO 2008].

Human cases of avian influenza have most often been linked to close human contact with sick or dying poultry from backyard operations. Such contact is common in countries where poultry are numerous and birds are not generally confined by enclosures.

Continued sporadic infections of humans with H5N1 could increase the chances that the virus will change so that it can pass more easily from human to human. This change could result in an influenza pandemic.

### Avian Influenza

### Preventive steps

Additional efforts are needed to prevent new cases of avian influenza in humans. In Thailand, public health education campaigns and media reports about avian influenza have reached rural people at greatest risk [Olsen et al. 2005]. However, this information has not resulted in changed behavior to control risks for many Thai people. Culling flocks of ill birds has been highly effective in controlling some avian influenza outbreaks. But this preventive measure may not be effective in areas of Southeast Asia, where backyard flocks are common and poultry movement is difficult to control [CDC 2004a,b; Olsen et al. 2005].

Poultry producers in the United States and around the world should take preventive steps to protect their workers and poultry flocks. Poultry producers can substantially reduce the risk to workers if they follow the recommendations listed in the following section.

## RECOMMENDATIONS FOR PROTECTING POULTRY WORKERS

NIOSH recommends the following preventive steps for protecting poultry workers who are at risk of exposure to avian influenza viruses. These recommendations are discussed in more detail in the following subsections. Recommendations are intended for both poultry producers (owners and operators of poultry farms) and poultry workers.

### Summary of recommendations

#### Take the following steps BEFORE an outbreak of avian influenza:

1. Make sure that an avian influenza response plan has been developed.

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2. Follow the biosecurity practices presented in this Alert.
3. Know the signs of avian influenza in poultry.
4. Report sick or dying birds immediately.
5. Know the possible signs and symptoms of avian influenza in humans.
6. Consider getting the current season's flu shot.
7. Train workers in all guidance and recommendations presented in this Alert.

**Take the following steps DURING an outbreak of avian influenza:**

1. Follow the avian influenza response plan.
2. Ask your doctor about taking antiviral medication.
3. Wear personal protective clothing:
  - Outer garments (impermeable aprons or coveralls)
  - Gloves
  - Footwear (boots or boot covers)
  - Disposable head cover or hair cover
4. Wear eye protection (goggles or a full-facepiece respirator).
5. Wear a NIOSH-certified, air-purifying respirator with a particulate filter (N-95 or better).
6. Follow a written respiratory protection program.
7. Protect yourself when removing personal protective equipment and clothing.
8. Use good hand hygiene (proper use of gloves, hand-washing, and waterless hand sanitizers) and decontamination procedures.

8

9. Shower at the end of the work shift and leave all contaminated equipment and clothing at work.
10. Participate in health surveillance and monitoring programs.

**Detailed recommendations**

**Take the following steps BEFORE an outbreak of avian influenza:**

1. Make sure that an avian influenza response plan has been developed to complement regional, State, and industry plans.
  - Use the following guidance to develop an avian influenza response plan:
    - CDC guidance in this Alert and at the following Web site: [www.cdc.gov/flu/avian](http://www.cdc.gov/flu/avian)
    - The USDA national plan for responding to an outbreak of highly pathogenic avian influenza in the



Avian Influenza

United States [APHIS 2007b]: [www.aphis.usda.gov/newsroom/hot\\_issues/avian\\_influenza/avian\\_influenza\\_summary.shtml](http://www.aphis.usda.gov/newsroom/hot_issues/avian_influenza/avian_influenza_summary.shtml). This plan is intended to complement regional, State, and industry plans.

- Select a response plan manager.
  - Coordinate your avian influenza response plan with appropriate State animal and public health agencies.
  - Make sure that workers are aware of the avian influenza response plan and their responsibilities.
2. **Follow biosecurity practices to keep avian influenza and other diseases out of your poultry flock [APHIS 2007a]:**
- Keep your poultry flock isolated from outside environments.
  - Prevent flocks from contacting wild birds and keep them away from water sources that might be contaminated by wild birds.
  - Allow only essential workers and vehicles to enter the farm and poultry houses.
  - Provide clean protective clothing, equipment, and disinfection facilities for workers.
  - Thoroughly clean and disinfect equipment and vehicles entering and leaving the farm. Include tires and undercarriage.
    - Use detergents and disinfectants (avian influenza viruses are sensitive to most).
    - Use EPA-registered disinfectants that are labeled as effective against influenza viruses.
    - Use heating and drying (which inactivate the viruses).
- Do not borrow equipment or vehicles from other farms and do not lend yours.
  - Avoid visiting other poultry farms.
  - If you do visit another farm or a live-bird market, change footwear and clothing before contacting your own flock again.
  - Do not bring birds from slaughter channels (especially live-bird markets) back to the farm.
3. **Know the signs of avian influenza in poultry.**
- Be aware of the signs of avian influenza infection in poultry so that you can do the following:
- Recognize sick birds
  - Quarantine the farm to prevent the spread of disease
  - Protect workers from infection
- In domestic poultry, signs of infection with the highly pathogenic H5N1 virus may vary depending on the viral strain, age and species of bird, other existing diseases in the poultry, and environment. The signs may include the following:
- Sudden death without clinical signs or symptoms
  - Lack of coordination
  - Lack of energy and appetite

- Soft-shelled or misshapen eggs
- Decreased egg production
- Purple discoloration of the wattles, combs, and legs
- Swelling of the head, eyelids, combs, wattles, and hocks
- Diarrhea
- Nasal discharge
- Coughing and sneezing

Some birds may be infected with avian influenza but appear to be healthy.

**4. Report sick or dying birds immediately.**

- Immediately report any sick or dying birds in your poultry flock to the proper authorities:
  - Call the U.S. Department of Agriculture (USDA) Veterinary Services toll free at  
**1-866-536-7593**
  - Or contact your State veterinarian or local extension agent.
- **Don't wait to report sick birds.** Early detection of avian influenza is essential to prevent its spread.

**5. Know the possible signs and symptoms of avian influenza in humans.**

Know the signs and symptoms of avian influenza in humans infected with the highly pathogenic H5N1 virus so that ill persons can be treated immediately:

- Fever
- Cough

- Shortness of breath
- Sore throat
- Muscle aches
- Conjunctivitis (redness, swelling, and pain in the eyes and eyelids)
- Diarrhea

Watch for these signs and symptoms of avian influenza for up to 10 days after exposure to infected or exposed birds or to virus-contaminated materials or environments.

So far, conjunctivitis has been extremely rare in humans infected with the highly pathogenic H5N1 virus—but it is a common symptom in humans infected with the highly pathogenic H7N7 virus. Avian influenza can also lead to pneumonia, acute respiratory distress, and other life-threatening complications.

**6. Consider getting the current season's flu shot.**

CDC recommends the current season's flu shot for workers involved in avian influenza control activities. Other poultry workers should also consider getting the current flu shot. Although a flu shot will not prevent infection with avian influenza, it *could* prevent dual infection—that is, infection with both an avian influenza virus *and* a human influenza virus at the same time. Such dual infection might result in the formation of new viral strains. If one of these new strains passes easily from person to person, an influenza pandemic could result.

For information about dual infection, use of antiviral medications, and vaccination of poultry workers, see the CDC Web site

on avian influenza at [www.cdc.gov/flu/avian/index.htm](http://www.cdc.gov/flu/avian/index.htm).

**7. Train workers in all guidance and recommendations presented in this Alert.**

**Take the following steps DURING an outbreak of avian influenza:**

- 1. Follow the avian influenza response plan.**
- 2. Ask your doctor about taking antiviral medication.**

Before you begin disease control activities during an outbreak of avian influenza, ask your doctor about taking antiviral medication. The Centers for Disease Control and Prevention (CDC) recommends that workers receive an influenza antiviral drug daily for the entire time they are in direct contact with infected poultry or with virus-contaminated materials or environments [CDC 2006b]. In addition, the Occupational Safety and Health Administration (OSHA) recommends that workers take the antiviral drug for 1 week following exposure [OSHA 2006].

Oseltamivir is currently the antiviral drug most often used for influenza. This drug is preferred because the avian influenza virus is less likely to be resistant to it than to amantadine or rimantadine (two other drugs used to prevent or treat influenza A). A fourth drug, zanamivir, may be considered as an alternative to oseltamivir for prophylaxis when available [Hayden and Pavia 2006].

**3. Wear personal protective clothing.**

Personal protective clothing is clothing that protects the torso (aprons, outer

garments, or coveralls), hands (gloves), feet (boots or boot covers), and head (head covers or hair covers) from exposure to harmful agents. Many poultry workers routinely wear personal protective clothing.

Poultry workers should be required to wear personal protective clothing whenever they may be exposed to avian influenza viruses. Such clothing will prevent skin contact with virus-contaminated materials or environments. It will also reduce the chances of carrying contaminated material outside the poultry barn or worksite.

**Outer garments.** When selecting protective outer garments such as aprons or coveralls, take the following steps:

- Select impermeable, disposable protective clothing when possible.
- Select lightweight clothing when appropriate to protect workers from heat stress. For example, choose a lightweight impermeable coverall instead of a chemical-resistant suit if possible.

**Gloves.** Gloves may be lightweight and disposable (8- to 12-mil nitrile or vinyl, for example), or they may be heavy duty rubber (18 mils thick or greater) and reusable after disinfection. Gloves should be waterproof. When selecting gloves, consider the following:

- Activities performed by the worker
- Dexterity requirements
- Need for glove durability and resistance to tearing and abrasion

Regardless of the type of gloves selected, make sure they do not make existing dermatitis worse or damage healthy skin from prolonged exposure to water or sweat. Wearing a thin cotton glove under a protective outer glove may prevent dermatitis.

**Foot protection.** Select disposable boot covers or boots that can be disinfected. These will protect workers from contact with harmful agents and will prevent them from being carried from one location to another.

**Head protection.** Select disposable, lightweight head covers or hair covers.

**Sources of personal protective clothing and equipment.** For sources and manufacturers of personal protective clothing or other personal protective equipment, see the *Buyer's Guide* of the International Safety Equipment Association [www.safetyequipment.org].

#### 4. Wear eye protection.

Eye protection is important to prevent eye contact with virus-contaminated dusts, droplets, and aerosols and to keep workers from touching their eyes with contaminated fingers or gloves.

- When working with poultry, wear unvented or indirectly vented safety goggles, a respirator with a full facepiece, or a powered, air-purifying respirator (PAPR) with a loose-fitting hood or helmet and face shield.
- If you wear safety goggles, make sure they are either
  - *unvented* (eyecup goggles, for example) or

— *indirectly vented*.

If indirectly vented goggles are properly fitted and have a good antifog coating, they may be used by poultry workers with a low risk of exposure to avian influenza. However, such goggles are not airtight and will not prevent exposures to airborne material.

- Do not use *directly vented* goggles or safety glasses for working with infected birds. They do not protect workers from fine particles, splashes, or aerosols.
- If you need *prescription lenses*, use
  - protective eyewear with built-in prescription lenses,
  - lens inserts,
  - protective eyewear that fits snugly over prescription glasses without changing their position or obstructing vision (such as full-facepiece respirators, PAPRs with hoods or helmets, and some styles of goggles), or
  - contact lenses with goggles, a respirator with a full facepiece, or a PAPR with a loose-fitting hood or helmet and face shield.
- Fit eye protection and respirators at the same time:
  - Some goggles can change the fit of a full-facepiece respirator.
  - Eye protection may interfere with the seal of a half-facepiece respirator.
- Wear your eye protection or prescription glasses when you check the seal of a respirator before each use.

Glasses should not protrude into the seal area of a full-facepiece respirator.

- Remove eye protection carefully to prevent contaminated equipment from contacting eyes, nose, or mouth.

For more information about eye safety, see [www.cdc.gov/niosh/topics/eye](http://www.cdc.gov/niosh/topics/eye).

**5. Wear a NIOSH-certified, air-purifying respirator with a particulate filter (N-95 or better).**

In agricultural environments, respirators are important to prevent exposures to viruses as well as to other agents such as bacteria, fungi, and endotoxins.

- Wear a NIOSH-certified, air-purifying respirator with a particulate filter (N-95 or better) whenever you are working in poultry barns or may be exposed to infected poultry or virus-contaminated materials or environments. These are the most practical and appropriate respirators for such use.
- See Table 1 to compare the costs and advantages of the five types of air-purifying respirators.
- See *NIOSH Respirator Selection Logic* [NIOSH 2005] and *Histoplasmosis—Protecting Workers at Risk* [NIOSH 2004] for more information about selecting and using respirators for infectious agents.

**6. Follow a written respiratory protection program.**

To make sure that respirators protect workers from avian influenza, do the following:

- Designate a person trained in the selection, use, and fitting of respirators to oversee the program and answer workers' questions.
- Provide workers with respirator training and fit testing to assure a safe and comfortable seal for the respirator facepiece.
- Include all workers who may be at risk of exposure to avian influenza virus.
- See *Safety and Health Topics: Respiratory Protection* [OSHA 2005] at [www.osha.gov/SLTC/respiratoryprotection/index.html](http://www.osha.gov/SLTC/respiratoryprotection/index.html) for more information about respiratory protection programs and respirators.

**7. Protect yourself when removing personal protective clothing and equipment.**

Protect yourself and prevent the avian influenza virus from spreading to other areas by taking these steps when removing protective clothing and equipment:

- With your respirator, goggles, and gloves on, remove all personal protective clothing.
  - Place disposable clothing in approved, secure containers<sup>1</sup> for biohazardous wastes (see the OSHA standard [29 CFR<sup>\*\*</sup>1910.1030(d)(4)(iii)(B)]).

<sup>1</sup>Approved, secure containers should be (1) closable, (2) constructed to contain all contents and prevent leakage of fluids during handling, storage, transport, or shipping, (3) labeled or color-coded, and (4) closed before removal, in accordance with the OSHA bloodborne pathogens standard in the *Code of Federal Regulations* [29 CFR 1910.1030(d)(4)(iii)(B)].

<sup>\*\*</sup>Code of Federal Regulations. See CFR in references.

- Place reusable clothing in approved, secure containers for cleaning and disinfection.
  - Remove gloves and discard them in an appropriate, secure container for biohazardous wastes.
  - Thoroughly wash your hands with soap and water.
  - If no hand-washing facilities are available, use waterless soaps or alcohol-based sanitizers provided by your employer.
  - Next, carefully remove your goggles and then your respirator.
  - Thoroughly wash your hands again with soap and water. If no hand-washing facilities are available, use waterless soaps or alcohol-based sanitizers provided by your employer.
- 8. Use the good hand hygiene and decontamination procedures outlined here to prevent infection, avoid taking viruses home, and keep them from spreading to other farms:**
- Wear gloves whenever you may be exposed to infected poultry.
  - Remove your gloves immediately after work and after removing protective clothing. Dispose of gloves in containers approved for biohazardous wastes to prevent the spread of disease (see the OSHA standard [29 CFR 1910.1030(d)(4)(iii)(B)]).
  - Wash your hands thoroughly with soap and water.
  - If no hand-washing facilities are available, use waterless soaps or alcohol-based sanitizers provided by your employer.
- 9. Shower at the end of the work shift and leave all contaminated clothing and equipment at work.**
- Shower at the worksite or at a nearby decontamination station.
  - Never wear contaminated clothing or equipment outside the work area.
- 10. Participate in health surveillance and monitoring programs.**
- Make sure a surveillance program has been established to identify workers who develop symptoms of avian influenza.
  - Seek immediate medical care for workers who develop any of the following symptoms within 10 days of exposure to infected or exposed birds or to virus-contaminated materials or environments:
    - Fever
    - Cough
    - Shortness of breath
    - Sore throat
    - Muscle aches
    - Conjunctivitis (eye infections)
    - Diarrhea
  - Tell the health care provider about the possible avian influenza exposure before the ill person arrives.

- Promptly report suspected human cases to supervisors and to local health authorities.

**ACKNOWLEDGMENTS**

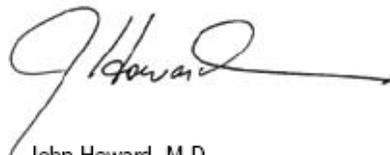
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Or call 1-800-CDC-INFO (1-800-232-4636) (TTY: 1-888-232-6348)

We greatly appreciate your assistance in protecting the health of U.S. workers.



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## Appendix A

### Advantages, Disadvantages, and Costs of Air-purifying Respirators for Protecting Poultry Workers<sup>1</sup>

Respirator type <sup>1</sup> and APF <sup>2</sup>	Advantages	Disadvantages	Cost (2004 dollars)
Filtering-facepiece respirator (disposable; dust mask); APF = 10	<ul style="list-style-type: none"> <li>• Is lightweight.</li> <li>• Needs no maintenance or cleaning.</li> <li>• Has no effect on mobility.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides no eye protection.</li> <li>• Provides no protection against irritant gases such as ammonia.</li> <li>• Can add to heat burden.</li> <li>• Permits inward leakage at gaps in face seal.</li> <li>• Does not have adjustable head straps on many models.</li> <li>• Is difficult for a user to do a seal check.</li> <li>• Varies greatly in level of protection provided by different models.</li> <li>• May make communication difficult.</li> <li>• Requires fit testing to select proper facepiece size.</li> <li>• May not fit properly when used with some eye-wear.</li> </ul>	\$0.70 to \$1.0
Elastomeric half-facepiece respirator, APF = 10	<ul style="list-style-type: none"> <li>• Requires low maintenance.</li> <li>• Has reusable facepieces and replaceable filters and cartridges.</li> <li>• Permits use of dual cartridges to protect workers from exposures to particles, gases, and vapors.</li> <li>• Has no effect on mobility.</li> </ul>	<ul style="list-style-type: none"> <li>• Provides no eye protection.</li> <li>• Can add to heat burden.</li> <li>• Permits inward leakage at gaps in face seal.</li> <li>• Requires cleaning and disinfection of facepiece before reuse and thus poses a contact exposure risk.</li> <li>• May make communication difficult.</li> <li>• Requires fit testing to select proper facepiece size.</li> <li>• May not fit properly when used with some eye-wear.</li> </ul>	Facepieces: \$1.2 to \$3.5 Filters: \$4 to \$8 each

<sup>1</sup> See footnotes at end of table.

(Continued). Advantages, Disadvantages, and Costs of Air-purifying Respirators for Protecting Poultry Workers\*

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Respirator type <sup>†</sup> and APF <sup>‡</sup>	Advantages	Disadvantages	Cost (2004 dollars)
Powered, air-purifying respirator (PAPR) with hood, helmet, or loose-fitting facepiece; APF = 25	<ul style="list-style-type: none"> <li>Provides eye protection.</li> <li>Provides protection for people with beards, missing dentures, or facial scars.</li> <li>Has low breathing resistance.</li> <li>Has combination cartridges that can be used for exposures to particles, gases, and vapors.</li> <li>Creates a cooling effect with flowing air.</li> <li>Has face seal leakage that is generally outward.</li> <li>Requires no fit testing.</li> <li>Permits wearing of prescription glasses.</li> <li>Permits better communication than rubber half-facepiece or full-facepiece respirators.</li> <li>Has reusable components and replaceable filters.</li> </ul>	<ul style="list-style-type: none"> <li>Has added weight from battery and blower.</li> <li>Is awkward to wear for some tasks.</li> <li>Requires cleaning and disinfection of components before reuse and thus poses a contact exposure risk.</li> <li>Requires battery charging.</li> <li>Requires air-flow testing with flow device before use.</li> </ul>	<p>Unit: \$400 to \$1,000</p> <p>Filters: \$10 to \$30</p>
Elastomeric, full-facepiece respirator with N-100, R-100, or P-100 filters; APF = 50	<ul style="list-style-type: none"> <li>Provides eye protection.</li> <li>Requires low maintenance.</li> <li>Has reusable facepieces and replaceable filters and cartridges.</li> </ul>	<ul style="list-style-type: none"> <li>Can add to heat burden.</li> <li>Has reduced field of vision compared with a half-facepiece respirator.</li> <li>Permits inward leakage at gaps in face seal.</li> </ul>	<p>Facepieces: \$90 to \$240</p> <p>Filters: \$4 to \$8</p> <p>Each nose cup: \$30</p>

See footnotes at end of table.

(Continued)

Avian Influenza

(Continued). Advantages, Disadvantages, and Costs of Air-purifying Respirators for Protecting Poultry Workers\*

Respirator type <sup>†</sup> and APF <sup>‡</sup>	Advantages	Disadvantages	Cost (2004 dollars)
	<ul style="list-style-type: none"> <li>Has combination cartridges that can be used for exposures to particles, gases, and vapors.</li> <li>Has no effect on mobility.</li> <li>Has a more effective face seal than a filtering-face piece or rubber half-facepiece respirator.</li> </ul>	<ul style="list-style-type: none"> <li>Requires cleaning and disinfection of facepiece before reuse and thus poses a contact exposure risk.</li> <li>Requires fit testing to select proper facepiece size.</li> <li>May require nose cup or lens treatment to prevent fogging of facepiece lens.</li> <li>Requires spectacle kit for users who wear prescription glasses.</li> </ul>	
Powered, air-purifying respirator (PAPR) with tight-fitting half facepiece or full facepiece; APF = 50	<ul style="list-style-type: none"> <li>Provides eye protection with full facepiece.</li> <li>Has low breathing resistance.</li> <li>Has face seal leakage that is generally outward.</li> <li>Creates a cooling effect with flowing air.</li> <li>Has reusable components and replaceable filters.</li> <li>Has combination cartridges that can be used for exposures to particles, gases, and vapors.</li> </ul>	<ul style="list-style-type: none"> <li>Has added weight from battery and blower.</li> <li>Is awkward to wear for some tasks.</li> <li>Provides no eye protection with a half facepiece.</li> <li>Requires cleaning and disinfection of components before reuse and thus poses a contact exposure risk.</li> <li>Requires fit testing to select proper facepiece size.</li> <li>Requires charging of battery.</li> <li>May make communication difficult.</li> <li>Requires spectacle kit for people who wear prescription glasses with full-facepiece respirators.</li> <li>Requires air-flow testing with flow device before use.</li> </ul>	Unit: \$500 to \$1,000 Filters: \$10 to \$30

\*All respirator types mentioned here meet the minimum requirements for N-95 respirators. †Alternative filter types may be obtained for each type of respirator described here. ‡APF = assigned protection factor

## **Appendix F**

### **PPE Donning-Doffing Protocol**

#### **Donning of PPE when Using NIOSH Approved--N95 Respirator**

1. Find a clean location to don equipment, away from AI contamination if possible.
2. Wash hands thoroughly with soap and water for 15-20 seconds.
3. Put on coveralls or gown, stepping into feet of coveralls if present. Zip up coveralls.
4. Put on shoe covers or boots. If wearing boots and non-footed coveralls, pull coverall legs out over boots. If wearing disposable shoe covers, wear two pair.
5. Respirator: Put respirator under your chin with nosepiece up. Pull bottom strap over your head and place around neck below ears. Pull top strap over head and rest it high at top back of head. Mold the nose area to the shape of your nose using fingertips, pushing inward while moving your fingertips down both sides of nosepiece. Check fit of the respirator: Place both hands over respirator, exhale sharply. If leaks are detected, readjust respirator. Seek assistance if respirator still does not fit properly.
6. Eye Protection: Position goggles over eyes and secure by placing strap securely at back of head. Goggles may in some cases be secured by ear pieces behind ears.
7. Head covering: If coveralls hooded, pull hood over head and secure around face. If wearing separate head cover, place over all straps and cover hair and ears.
8. If wearing impermeable apron, put strap over head and secure straps behind back.
9. Hand covers: Put on inner gloves, usually clear or light weight. Put on outer gloves, usually heavier weight. Secure tops of gloves over the cuffs of your arm coverings and tape in place.

#### **Doffing of PPE wearing NIOSH Approved--N95 Respirator**

1. Prepare clean/dirty area way from contamination for removing PPE. Gather plastic bag for disposal and germicidal wipes or disinfectant spray or gel.
2. Clean outer surface of gloves and outer boots with disinfectant. If you are using a wipe, place in disposal bag when done.
3. If wearing apron, remove and place in disposal bag.
4. If wearing outer disposable shoe covers, remove and dispose of in bag.
5. Remove outer gloves and place in disposal bag.

6. Remove any tape that was used to secure sleeves to gloves.
7. Unzip and roll down coveralls turning inside out, step out of them and place in disposal bag. If wearing gown, untie back and neck areas, pull off inside out, leaving arms till last, and place in disposal bag.
8. Remove hair covering if still in place and place in disposal bag.
9. Remove eye covering, being careful to handle it by bands or earpieces. Place in disposal bag.
10. Remove respirator, being careful to handle by bands, grasping bands and pulling out toward front and over head to remove. Place in disposal bag.
11. Remove inner gloves, grasping cuff of one hand with other gloved hand, rolling down inside out till removed. Drop into disposal bag. To remove second glove, reach inside cuff and pull down, rolling outward inside out till removed. Drop into disposal bag.
12. Close disposal bag securely and place in area designated so that it may be disposed of properly.
13. Wash hands and forearms with soap and water for 15-20 seconds, rinse and dry with clean towel. Depending upon pathogenicity of virus on the premise and exposure of worker, a shower may be required. No clothing worn onto the premise may leave the premise. Non-disposable clothing may be disinfected for further use if facilities are available.

## **Donning of PPE When Wearing Powered Air Purifying Respirator (PAPR)**

1. Find a clean location to don equipment, away from AI contamination if possible.
2. Wash hands thoroughly with soap and water for 15-20 seconds.
3. Put on coveralls or gown, stepping into feet of coveralls if present. Zip up coveralls.
4. Put on shoe covers or boots. If wearing boots and non-footed coveralls, pull coverall legs out over boots. If wearing disposable shoe covers, wear two pair. Put on apron if using one.
5. Attach PAPR hose to power pack. Be sure appropriate cartridges are attached to power pack. Turn on power pack to verify operation and check for flow to hood.

6. Place power pack on mid back and secure in place with belt strap. Turn on power pack.
7. Attach PAPR hose to hood and put hood on, fully covering face and chin. If using half-hood or helmet, hair covering is necessary prior to putting on hood.
8. Hand covers: Put on inner gloves, usually clear or lighter weight. Put on outer gloves, usually heavier weight. Secure tops of gloves over the cuffs of your arm coverings and tape in place.

## **Doffing of PPE when Wearing Powered Air Purifying Respirator (PAPR)**

### **An assistant is required to minimize contamination of PAPR**

1. Prepare clean/dirty area way from contamination for removing PPE. Gather plastic bag for disposal and germicidal wipes or disinfectant spray or gel.
2. Clean outer surface of gloves and outer boots with disinfectant. If you are using a wipe, place in disposal bag when done.
3. If wearing apron, remove and place in disposal bag.
4. If wearing outer disposable shoe covers, remove and dispose of in bag.
5. Remove tape used to secure sleeves to glove cuffs.
6. Remove outer gloves and place in disposal bag.
7. Gloved assistant supports PAPR power pack while worker unfastens power pack belt.
8. Assistant continues to support PAPR power pack while worker removes hood. Worker disconnects PAPR hose from hood and places hood/helmet in disposal bag or designated bag for cleaning and disinfection if not disposable. Worker removed head cover if wearing one. Assistant removes PAPR power pack with hose attached and places in designated place for cleaning and disinfection
9. Unzip and roll down coveralls turning inside out, step out of them and place in disposal bag.
10. Remove inner gloves, grasping outside cuff of one hand with other gloved hand, rolling down inside out till removed. Drop into disposal bag. To remove second glove, reach inside cuff with bare hand and pull down, rolling outward inside out till removed. Drop into disposal bag.

11. Close disposal bag securely and place in area designated so that it may be disposed of properly.
12. Wash hands and forearms with soap and water for 15-20 seconds, rinse and dry with clean towel. Depending upon pathogenicity of virus on the premise and exposure of worker, a shower may be required. No clothing worn onto the premise may leave the premise, including shoes and underwear. Non-disposable clothing must be treated as if contaminated but may be disinfected for further use if facilities are available.

## **Donning of PPE When Wearing Full Face Respirator**

1. Find a clean location to don equipment, away from AI contamination if possible.
2. Wash hands thoroughly with soap and water for 15-20 seconds.
3. Put on coveralls or gown, stepping into feet of coveralls if present. Zip up coveralls.
4. Put on shoe covers or boots. If wearing boots and non-footed coveralls, pull coverall legs out over boots. If wearing disposable shoe covers, wear two pair.
5. Respirator: Be sure face is clean-shaven. Be sure appropriate filter cartridges are attached to face mask securely. Place face mask in position over face. Grasp straps in one hand while holding face mask in position with other hand. Pull straps over your head and settle in place behind head so that mask is secure. Check fit of the respirator: Place both hands over respirator, exhale sharply. If leaks are detected, readjust respirator. Seek assistance if respirator still does not fit properly.
6. Head covering: Pull coverall over head and secure around face mask. Secure hood to mask with tape.
7. If wearing impermeable apron, put strap over head and secure straps behind back.
8. Hand covers: Put on inner gloves, usually clear or lighter weight. Put on outer gloves, usually heavier weight. Secure tops of gloves over the cuffs of your arm coverings and tape in place.

## **Doffing of PPE when Wearing Full Face Respirator**

1. Prepare clean/dirty area way from contamination for removing PPE. Gather plastic bag for disposal and germicidal wipes or disinfectant spray or gel.
2. Clean outer surface of gloves and outer boots with disinfectant. If you are using a wipe, place in disposal bag when done.

3. If wearing apron, remove and place in disposal bag.
4. If wearing outer disposable shoe covers, remove and dispose of in bag.
5. Remove tape used to secure hood to face mask and sleeves to glove cuffs.
6. Remove outer gloves and place in disposal bag.
7. Unzip and roll down coveralls turning inside out, step out of them and place in disposal bag.
8. Remove respirator mask, being careful to handle by bands, grasping bands with one hand behind head and pulling up and out toward front and over head to remove while holding mask in place with other hand. Place mask in plastic bag in designated dirty area for cleaning and disinfection.
9. Remove inner gloves, grasping outside cuff of one hand with other gloved hand, rolling down inside out till removed. Drop into disposal bag. To remove second glove, reach inside cuff with bare hand and pull down, rolling outward inside out till removed. Drop into disposal bag.
10. Close disposal bag securely and place in area designated so that it may be disposed of properly.
11. Wash hands and forearms with soap and water for 15-20 seconds, rinse and dry with clean towel. Depending upon pathogenicity of virus on the premise and exposure of worker, a shower may be required. No clothing worn onto the premise may leave the premise, including shoes and underwear. Non-disposable clothing must be treated as if contaminated but may be disinfected for further use if facilities are available.

## Appendix G

### Sample Collection for Avian Influenza (AI) Surveillance rRT-PCR and Virus Isolation

#### **Swab pools for RRT-PCR and environmental samples for Virus Isolation**

1. Begin with a clean, decontaminated cooler for sample transport, with wet ice or chill packs prepared. Do not use dry ice. Pre-label tubes or bags with sample ID, animal ID, specimen type.
2. The preferred specimens for the real-time RT-PCR assay and virus isolation are tracheal or oropharyngeal swabs from gallinaceous birds such as chickens, turkeys, guinea fowl, pheasants, quail, etc. For other birds, such as ducks, geese, etc., cloacal and oropharyngeal swabs are preferred (kept separately). The organic load in cloacal swabs may interfere with efficient recovery of target RNA; therefore, cloacal swabs should be tested by virus isolation before they are considered to be negative.
3. The synthetic shaft Dacron polyester tip swabs should be placed in brain-heart-infusion broth (BHI) tubes or viral transport media (as specified by Rollins Laboratory). The swab container must be leak-proof.
4. Swabs can be pooled as follows:
  - a. Tracheal/oropharyngeal swabs: 5 birds/tube
  - b. Cloacal swabs: 5 birds/tube
  - c. DO NOT POOL cloacal and tracheal/Oropharyngeal swabs together.
  - d. Swabs from multiple avian species must be collected and pooled separately by species.
5. Swirl swabs to dislodge contents into the medium. Squeeze against the walls of the tube before removal. Do not send swabs with the samples. Place swabs in trash bag after swirling in medium.
6. Securely seal tubes to prevent leakage.
7. Place sealed tubes in Ziploc bag or box for transport, preferably Ziploc bag. Dip the Ziploc bag in disinfectant and allow excess disinfectant to run off the bag. Have a second, non-contaminated person hold a clean, open Ziploc bag. Place the disinfected bag into the clean outer bag. Place the double bagged samples into a clean cooler outside of the

infected building. Paperwork should be placed in a clean Ziploc bag, separate from the double bagged samples.

8. Keep specimens chilled (wet ice or cold gel packs) and deliver to the laboratory or ship by overnight courier. Do not place samples in a freezer.
9. If shipping, samples should be packed in rigid container with absorbent material surrounding the samples.
10. If samples are hand-delivered to the laboratory, the samples should be collected in the same manner as described in item 7 prior to delivery to lab. In addition, paperwork for the samples must be placed within a separate Ziploc bag and the exterior disinfected. Laboratory personnel must be able to handle the samples safely, so they should only receive containers that have been disinfected after any handling.
11. Following delivery of the samples, disinfect the cooler and chill packs prior to returning them to your vehicle. Any wet ice being discarded should be disinfected prior to dumping.

### **Fresh Tissues**

1. Begin with a clean, decontaminated cooler for sample transport, with wet ice or chill packs prepared. Tissues must not be frozen. Do not use dry ice.
2. Place collected tissues in leak proof plastic bag—whirl-pak or Ziploc. Bag should be pre-labeled with animal ID, sample ID, and tissue type.
3. Place tissues in bag, close tightly, and put this bag inside a second Ziploc bag. Disinfect the outside of the outer bag and place into cooler. Keep sample chilled.
4. Deliver to lab or ship overnight. If shipping, place samples in outer rigid leak-proof container with absorbent material. Paperwork to travel to lab with sample should be placed in a separate Ziploc bag and the bag disinfected.

### **Serum or Blood Samples**

1. Pre-label tubes with animal ID sample ID and sample type. Tubes should be leak-proof.
2. Serum samples should be poured or pulled off blood clot and placed into clean pre-labeled tube.
3. Seal tubes to prevent leakage.
4. Place sealed tubes in Ziploc bag or box for transport. Place bagged samples in second container (Ziploc bag) and decontaminate the outer surface with disinfectant.

5. Keep specimens chilled (wet ice or cold gel packs) and deliver to the laboratory or ship by overnight courier. Do not place samples in a freezer.
6. If shipping, samples should be packed in rigid container with absorbent material surrounding the samples.
7. If samples are hand-delivered to the laboratory, the outside of the Ziploc bag containing the samples should again be disinfected prior to delivery to lab. In addition, paperwork for the samples must be placed within a separate Ziploc bag and the exterior disinfected. Laboratory personnel must be able to handle the samples safely, so they should only receive containers that have been disinfected after any handling.
8. Following delivery of the samples, disinfect the cooler and chill packs prior to returning them to your vehicle. Any wet ice being discarded should be disinfected prior to dumping.

**Formalin Fixed Tissue**

1. Pre-label leak-proof screw-top formalin container with animal ID, Sample ID and tissue type(s).
2. Place tissues (1:10 tissue to formalin, tissue samples no larger than 1.5 cm cube) in formalin and close top tightly.
3. Seal container. Place container in Ziploc bag and disinfect outside of bag.
4. Deliver to lab or ship overnight.
5. If shipping, place formalin containers (in outer bags) into rigid container with absorbent material surrounding samples. Paperwork with tissue samples must be placed in an outer Ziploc bag and disinfected prior to packing.
6. Important! Do not place tissues in formalin near ice packs or on ice. If in same container as samples which must be chilled, place foam insulation between chilled and room temperature samples.

## Appendix H

### On-Farm Protocol for AI Barrel Surveillance

(modified from DPI, July 1, 2002)

Protocol for the day before:

- a. Obtain the next days' premises assignments, maps, and labels. Decide on order of visiting premises.
- b. Fill water jugs with water
- c. Place enough empty tube boxes (1 per farm expected plus 1-2 extras) in car.
- d. Obtain enough biosecurity packs (note sizes) to cover the number of farms that you have scheduled.
- e. Obtain ten pair of sterilized scissors in plastic container
- f. Obtain clean container which will hold disinfectant and used scissors.
- g. Obtain at least 360 sterile swabs.
- h. Make sure cab of vehicle is equipped with equipment listed for front of vehicle.
- i. Make sure trunk or back of vehicle is equipped with equipment listed for back of vehicle.
- j. Call all producers on your list, except for \_\_\_\_\_, and remind them that you will be collecting samples at their farm the next day.

First thing in the morning:

- a. Obtain ice
- b. Mix disinfectant in sprayer @ 1 rounded Tablespoon/gallon.
- c. Obtain two full boxes of BHI broth and place in front of car. Assure that the tubes contain 2cc and that caps are on tight.
- d. Put disinfectant in empty plastic container which will hold used scissors.
- e. Inform Team Leader of itinerary

**Protocol for Collector:**

1. Before leaving vehicle, close windows of vehicle. Place two pairs of boots over your shoes (if you have clear plastic ones, put those on the inside. Some kits will have two pairs of identical boots).
2. Get out of vehicle. Put on Tyvek suit, hair bonnet and two pairs of gloves. Before donning gloves, tape trash bag(s), including a heavy duty "bird bag", to your suit with the duct tape, then put on your two pair of gloves. Put on N-95 mask. Duct tape can be used to tape Tyvek sleeves to gloves, this will prevent skin contamination when reaching into the can. Get disinfectant sprayer out. Place vehicle Safety Triangles appropriately.
3. Check the can, estimate the number of birds & inform assistant of number of BHI tubes & swabs needed.
4. Remove one bird at a time from the container. Place lid upside-down on trash can if you want to use it as a collection surface and place clean plastic bag on top of lid as a "table cloth" (can also do sample collection on ground, in that case, place trash bag on ground for your work surface).

5. Obtain a pair of clean scissors from your assistant.
6. Use scissors to expose the trachea. Take a swab from your assistant and swab the Oropharyngeal area with a dry swab.
7. Place the swab in the BHI or viral transport medium tube which your assistant will hold for you (you do not touch the tubes). Wring the swab put against the neck of the tube, then throw swab away into your trash bag. No more than **5** swabs per tube, and swabs should always be pooled for the same species unless some birds are more decomposed than others.
8. Get a heavy duty trash bag from your assistant. Place the sampled bird into the bag and close. Continue to put sampled birds in the bag until sampling is completed. More than one trash bag may be needed to complete sampling.
9. Continue collecting tracheal swabs. Place up to five swabs in each tube. There may be up to ten birds per house but there also may be multiple houses per farm. All samples from each farm should go into the same sample box.
10. When sampling is completed, have your assistant open the plastic container with the disinfectant and place your used scissors in there. Place bag of birds into garbage can.
11. Put the plastic "table cloth" (trash bag) into the bag you are filling with trash. Remove your first pair of gloves and place them in your trash bag.
12. Remove your Tyvek suit, bonnet and outer pair of boots and place in your trash bag.
13. Place your trash bag and your assistant's trash bag into the trash can.
14. Mark all the trash cans with surveyor's tape (no pink tape) so the producers will know you have taken your samples & seal the lid with a bungee cord.
15. Spray the outside of all containers, which held birds, with Virkon-S.
16. Spray sample bag, safety triangles & sprayer handle with disinfectant.
17. Sit in the car without your hands or feet touching the inside. Remove both boots by inverting the boot before removing the last pair of gloves. Remove second pair of gloves by inverting over the balled up boots to make one ball, which you will place in a zip lock bag and seal.
18. Spray your shoes with Lysol and wash your hands with waterless hand cleaner.
19. When back at the ICP, remove the scissors from the disinfectant, clean thoroughly with water. After scissors are clean, lay them out to air dry for 24 hours. Use a second set of scissors for the next day's testing. Then repeat steps above under "the day before."

## Protocol for Assistant:

1. Upon reaching the premise, park the vehicle in a safe location off the road, near where the containers are placed at each designated farm location. Check **GPS** coordinates for the can location & record any changes on the Sampling Order Form in the producer block.
2. Next the collector will check the can for birds. When notified of the number of Bill tubes needed, label tubes & place into a clean, empty box. Put in an extra tube or two for errors. Also, place farm number on top & bottom of box (use extra label if available). Open swabs and place appropriate # of swabs each into zip lock bags. You should also put some extra swabs in the bag.
3. Before leaving vehicle, close windows of vehicle. Place two pairs of boots over your shoes (if you have clear plastic ones, put those on the inside. Some kits will have two pairs of identical boots).
4. Get out of vehicle. Put on Tyvek suit, hair bonnet and two pairs of gloves. Before donning gloves, tape trash bag(s) to your suit with the duct tape, then put on your two pair of gloves. Put on N-95 mask. Duct tape can also be used to tape Tyvek sleeves to gloves, this will prevent skin contamination when reaching into the can.
5. Bring pre-labeled BHI tubes (in a sample box which is for this farm only), scissors, swabs and trash bags for bird disposal out of the car.
6. Offer Collector scissors when he is ready. When collector is ready, open and offer a dry swab. You are holding the BHI box. Open BHI tube for collector to place up to five swabs in.
7. The Collector will remove the swabs. Swabs go in trash bag never in the bird bag. When he has completed this, close tubes tightly. Dump extra BHI broth from the unused tubes in trash bag (empty glass tubes stay in box and will be disposed of in lab. Do not put empty glass tubes in trash bag!) Remove outer gloves.
8. Place completed sampling box in a small plastic bag. After disinfection, place samples directly in cooler.
9. Remove bonnet, Tyvek suit, and outer boots and place in trash bag. Collector will place bag in bird container.
10. Sit in the car without your hands or feet touching the inside. Remove both boots by inverting the boot before removing the last pair of gloves. Remove last pair of gloves by inverting over the balled up boots to make one ball, which you will place in a zip lock bag.
11. Spray your shoes with Lysol and wash your hands with waterless hand cleaner. Prepare for next farm.

12. Contact your Team Leader before you go to your last farm. If your Team Leader cannot be reached, contact the Surveillance Office.
13. Notify your Team Leader after you have finished your last farm. Be ready to lend assistance in another team area if requested.
14. Contact the lab so they know you are coming in & to give them an approximate arrival time. Also notify the lab if you are not coming into the lab.

End of day:

1. Wash Car.
2. Assistant will run RRT-PCR/antigen capture ELISA samples (swab pools) and paperwork into the lab.
3. Collector will ready supplies and get maps for next day. Collector will assist where needed. Collector will make sure the "Sample Order Form" is filled out correctly and will hand in this form and any other forms to the Surveillance data-entry personnel at the Emergency Operations Center before leaving for the day.
4. Check with Team Leader before going home for the day.

Note: Please keep your eyes out for any backyard flocks or "unknown" poultry farms. If you see any, obtain GPS coordinates, notate on the map and fill out any available name or address information on the "Backyard Flock Surveillance Form". If it is an "unknown" poultry farm, scratch out the words Backyard flock on the form.

Please fill out the order of flocks you visit or contact on the "Sampling Order Form" as you visit.

If you note biosecurity lapses (by company personnel or other), complete a Biosecurity report and turn it into the Emergency Operations Center.

# Appendix I

## General Biosecurity Practices Of the Poultry Industry

- 1) SERVICE TECHS AND BREEDER SERVICING CREW
  - a. Park a minimum of 100' from first poultry house you approach when possible.
  - b. Keep vehicle windows closed on farms.
  - c. Service Technicians must put on clean coveralls, hairnets and boots (rubber or disposable) prior to entering poultry houses.
  - d. Clean and disinfect all equipment before entering houses.
  - e. Use hand sanitizer or disposable gloves before entering and when exiting houses.
  - f. Clean & disinfect vehicles inside daily, outside weekly.
  
- 2) FEED MILL
  - a. Wash trucks to remove mud and debris to the extent needed to allow effective disinfection.
  - b. Clean and disinfect the cabs on feed trucks with aerosol product daily. Spray the floors and pedals with approved disinfectant.
  
- 3) HATCHERY
  - a. All drivers are to wear boots (rubber or disposable).
  - b. Egg trucks are to be cleaned and disinfected inside daily and outside as needed.
  - c. Chick/poult delivery trucks should be kept clean inside and outside.
  - d. Spray insecticide inside trucks as needed to eliminate the transporting of flies from farm to farm.
  - e. Egg racks and trays must be washed and disinfected before leaving hatchery.
  - f. Wash chick/poult boxes and delivery carts at least once a week.
  - g. Hatchery waste trucks going to rendering need to be cleaned and disinfected before returning. Load should be hauled at the end of the day. Sweep out the cab and spray pedals and floorboard with an approved disinfectant. Spray insecticide as needed.
  - h. Eggs brought to hatcheries should be from source flocks participating in NPIP or other disease monitoring programs.
  
- 4) LIVE HAUL (Single Age)
  - a. All equipment is to be cleaned and disinfected as needed.
  
- 5) LIVE HAUL (Multi Age)
  - a. All equipment is to be cleaned and disinfected between farms.
  
- 6) DEAD BIRD DISPOSAL
  - a. Composting must be managed properly to ensure carcasses are covered to prevent exposure to wild animals and to maintain adequate temperatures for composting.

- b. When on-farm incineration is used, carcasses must be protected from exposure to wild animals.
  - c. Farms should not share disposal facilities. Rendering can be used for daily mortality if approved by company management. Growers that use rendering must clean and disinfect vehicles prior to returning to their farm, and vehicles transporting carcasses should not travel from farm to farm to pick up daily mortality for delivery to the rendering plant.
- 7) GROWERS, FARM MANAGERS, AND HIRED HELP
- a. Biosecurity/Disease Control Area signs will be posted at farm entrance.
  - b. Growers should keep out visitors and not visit other poultry facilities.
  - c. Minimize the number of vehicles entering the farm.
  - d. Be sure that visitor guidelines are followed when a service call is needed (see Appendix E).
  - e. Do not allow pets, livestock or wild animals to enter poultry houses.
  - f. Keep wild birds out of poultry houses.
  - g. Practice effective rodent and insect control.
  - h. Keep workrooms clean.
  - i. No birds of any kind will be visited or kept by the Grower or hired help.
  - j. Sharing equipment between Growers is not recommended. In the event that equipment must be shared, effective cleaning and disinfecting must take place prior to movement between farms.
  - k. Growers should wear clean protective clothing or clothing dedicated to the farm prior to entering poultry houses.
  - l. Notify a company representative if you observe others not following good biosecurity.
- 8) GENERAL
- a. Poultry company personnel and growers must avoid any contact with live bird markets and noncommercial poultry. Companies will perform a documented assessment of service tech contact with other poultry or bird species at hire and annually.
  - b. Poultry companies will comply with applicable disease surveillance protocols.
  - c. Poultry companies will hold training on biosecurity program for service techs, hatchery personnel, feed mill personnel, live-haul personnel, and growers.
  - d. If there is an outbreak of a highly contagious disease refer to the prevention and rapid response plan and individual company policies for increased biosecurity measures.

# Appendix J

## Biosecurity Measures for Poultry Farm Visitors

All poultry farms are biosecured areas and all traffic must be kept to a minimum. If any business can be conducted over the phone, please do so. If a visit **MUST** be made to a farm, coordinate it with the grower and/or the appropriate poultry company contact and follow the steps below at all times.

- All vehicles entering a poultry farm must stop at the farm entrance and fill out the visitor log in the mailbox (for farms that have boxes). Please include your name, date, time, company association, reason for visit, and farms visited previously on that day.
- ALL vehicles must be thoroughly disinfected before entering and before leaving a poultry farm. Remember, surfaces must be adequately cleaned in order for disinfectants to work.
- Personnel driving or riding in a vehicle that goes on the farm must have protective boots. Either rubber or disposable plastic boots must be put on before getting out of the vehicle. These boots must be worn the whole time on the farm, and be discarded or cleaned and disinfected onsite before re-entering your vehicle.
- Vehicle windows should be rolled up at all times while on the poultry farm in order to prevent flies from getting into the vehicle.
- For all service vehicles, the floorboard area, including pedals and the entire floor, must be cleaned and disinfected daily. This is needed even if wearing disposable plastic boots.
- Entry into the poultry houses is strictly forbidden unless pre-authorized by the grower or the poultry company.
- Any repairs that require entry into poultry houses must include clean coveralls, hair nets, clean boots and use of the disinfect stations provided at the door.
- When exiting the farm, disposable boots should be put in a receptacle provided at the farm. Then spray shoes with disinfectant before entering your vehicle.
- Hands, rubber boots and any tools or equipment used on the farm must be washed and disinfected.
- Vendor vehicles must be kept clean at all times.
- If you encounter any questionable disease situations on a farm, please call the appropriate poultry company contact before going to other farms. Remember, these are minimal guidelines, and some operations may have additional requirements.

# Appendix K

## Approved Disinfectants for AI

(From <http://www.epa.gov/pesticides/factsheets/avian.htm>)

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

Current as of July 13, 2007

### For More Information

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

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.](#)

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	** <a href="#">Manufacturer Contact Information</a>
106-72	Maxima 128	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Brunin & Company, Inc.>
106-73	Maxima 256	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Brunin & Company, Inc.
106-79	Broadspec 256	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Brunin & Company, Inc.
106-81	Maxima RTU	<a href="#">5, 9, 10, 19</a>	solution-ready to use	Brunin & Company, Inc.
134-65	DC&R Disinfectant	<a href="#">2, 7, 12</a>	soluble concentrate	Hess & Clark, Inc.
211-25	Pheno Cen Germicidal Detergent	<a href="#">17, 20, 24</a>	soluble concentrate	Central Solutions, Inc.
211-32	Pheno Cen Spray Disinfectant	<a href="#">11, 16</a>	pressurized liquid	Central Solutions, Inc.
211-50	Q5.5-5 NPB 2.5 HW	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Central Solutions, Inc.
211-62	Low pH Phenolic>	<a href="#">1, 16</a>	soluble concentrate	Central Solutions, Inc.
303-91	Hi-Tor Plus Germicidal	<a href="#">5, 9</a>	soluble concentrate	Huntington Professional
464-689	Ucarsan Sanitizer 420	<a href="#">13</a>	soluble concentrate	The Dow Chemical Company
464-696	Ucarsan Sanitizer	<a href="#">13</a>	soluble concentrate	The Dow Chemical Company

<b>Registration Number</b>	<b>Product Name</b>	<b>*Active Ingredient</b>	<b>Formulation Type</b>	<b>**<a href="#">Manufacturer Contact Information</a></b>
	4128			
464-700	Ucarcide 14 Antimicrobial	<a href="#">5, 13</a>	solution-ready to use	The Dow Chemical Company
464-702	Ucarcide 42 Antimicrobial	<a href="#">5, 13</a>	solution-ready to use	The Dow Chemical Company
464-715>	Ucarsan 442 Sanitizer	<a href="#">5, 13</a>	soluble concentrate	The Dow Chemical Company
464-716	Ucarsan 414 Sanitizer	<a href="#">5, 13</a>	soluble concentrate	The Dow Chemical Company
777-72	Biosol	<a href="#">5, 11</a>	Ready to Use Liquid	Reckitt Benckiser
1043-91	LpH Master Product	<a href="#">3, 16</a>	soluble concentrate	Steris Corporation
1677-129	Oxonia Active	<a href="#">15, 21</a>	soluble concentrate	Ecolab, Inc.
1677-158	Vortexx	<a href="#">14, 18, 21</a>	soluble concentrate	Ecolab, Inc.
1677-203	OxySept LDI	<a href="#">14, 21</a>	soluble concentrate	Ecolab, Inc.
1839-86	BTC 2125 M 10% Solution	<a href="#">4, 6</a>	soluble concentrate	Stepan Company
1839-95	NP 4.5 (D &F) Detergent/Disinfectant	<a href="#">4, 6</a>	Soluble concentrate	Stepan Company
1839-154	Scented 10% BTC 2125M Disinfectant	<a href="#">4, 6</a>	soluble concentrate	Stepan Company
1839-155	BTC 2125M 20% Solution	<a href="#">4, 6</a>	soluble concentrate	Stepan Company
1839-173	7.5% BTC 885 Disinfectant	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Stepan Company
3838-36	Quat 44	<a href="#">4, 6</a>	soluble concentrate	Essential Industries, Inc.
3838-37	Quat Rinse	<a href="#">4, 6</a>	soluble concentrate	Essential Industries, Inc.
3862-177	Tek-Trol Disinfectant	<a href="#">1, 3, 16</a>	soluble concentrate	ABC Compounding Co.
5813-1	Clorox	<a href="#">30</a>	Soluble concentrate	Clorox Company
6659-3	Spray Nine	<a href="#">4, 6</a>	Ready to Use Liquid	Spray Nine Corporation
6836-70	Bardac 205M-7.5B	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-71	Lonza Formulation Y- 59	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-75	Lonza Formulation S- 21	<a href="#">5, 10, 11, 21</a>	soluble concentrate	Lonza, Inc.
6836-77	Lonza Formulation S- 18	<a href="#">5, 10, 11, 21</a>	soluble concentrate	Lonza, Inc.
6836-78	Lonza Formulation R- 82 >	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-136	Lonza Formulation S- 18F	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-139	Lonza Formulation R- 82F	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-140	Lonza Formulation S- 21F	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-152	Lonza Formulation DC-130	<a href="#">5, 9, 10, 19</a>	solution-ready to use	Lonza, Inc.
6836-233	Bardac 205M-50	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-252	Phencide 256	<a href="#">1, 16</a>	soluble concentrate	Lonza, Inc.
6836-253	Phenocide 128	<a href="#">1, 16</a>	soluble concentrate	Lonza, Inc.

Registration Number	Product Name	*Active Ingredient	Formulation Type	** <a href="#">Manufacturer Contact Information</a>
6836-266	Bardac 205M-10	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-277	Bardac 205M 1.30	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-278	Bardac 205M 14.08	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-302	Bardac 205M 5.2	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
6836-303	Bardac 205M 7.5B	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Lonza, Inc.
8155-23	Husky 806 H/D/N	<a href="#">9</a>	Soluble concentrate	Canberra Corporation
8383-3	Sporicidin Brand Disinfectant solution	<a href="#">22, 31</a>	Ready to use Liquid	Sporicidin International
70060-19	Aseptrol S10-Tabs	<a href="#">27, 28</a>	Pellet/tablet	Engelhard Corporation
70144-1>	Opticide-3	<a href="#">4, 6</a>	Ready to Use	Micro-Scientific Industries
71654-7	Virkon	<a href="#">21, 22</a>	Pellet/tablet	DuPont Chemical Solutions
74331-2	DisinFx	<a href="#">8, 23, 14</a>	Ready to use Liquid	SteriFx Inc.
74559-1	Accel TB	<a href="#">13</a>	Ready-to-Use Liquid	Virox Technologies
10324-56	Maquat 256	<a href="#">4, 6</a>	<a href="#">soluble concentrate</a>	Mason Chemical Company
10324-58	Maquat 128	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-59	Maquat 64	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-63	Maquat 10	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-67	Maquat MQ615-AS	<a href="#">5, 8, 9, 17</a>	soluble concentrate	Mason Chemical Company
10324-72	Maquat 615 HD	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Mason Chemical Company
10324-80	Maquat 5.5M	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Mason Chemical Company
10324-81	Maquat 705M	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Mason Chemical Company
10324-85	Maquat 86 M	<a href="#">5, 9, 10, 19</a>	solution-ready to use	Mason Chemical Company
10324-94	Maquat 20M	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-96	Maquat 50DS	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-99	Maquat 10	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-115	Maquat 750 M	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Mason Chemical Company
10324-117	Maquat 710 M	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Mason Chemical Company
10324-118	Maquat 256 EBC	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-119	Maquat 128 EBC	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-120	Maquat 64 EBC	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-131	Maquat A	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Mason Chemical Company
10324-141	Maquat 256-NHQ	<a href="#">5, 9</a>	Soluble concentrate	Mason Chemical Company
10324-142	Maquat MQ2425 M 14	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-143	Maquat 10B	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-145	Maquat FP	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
10324-162	Maquat 2420 Citrus	<a href="#">5, 9</a>	soluble concentrate	Mason Chemical Company
10324-164	Maquat 256 PD	<a href="#">4, 6</a>	soluble concentrate	Mason Chemical Company
11600-4	Sanox II	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Conklin Co., Inc.
47371-6	Formulation HS 652Q	<a href="#">5, 9</a>	soluble concentrate	H&S Chemicals Division
47371-7	Formulation HS 821Q	<a href="#">5, 9</a>	soluble concentrate	H&S Chemicals Division
47371-36	HS-867Q	<a href="#">5, 9</a>	soluble concentrate	H&S Chemicals Division
47371-37	HS-267Q	<a href="#">5, 9</a>	soluble concentrate	H&S Chemicals Division

<b>Registration Number</b>	<b>Product Name</b>	<b>*Active Ingredient</b>	<b>Formulation Type</b>	<b>**<a href="#">Manufacturer Contact Information</a></b>
47371-141	germicidal Cleaner Formulation HH 652Q	<a href="#">5, 9</a>	soluble concentrate	H&S Chemicals Division
56392-7	Dispatch Hospital Cleaner with Bleach	<a href="#">30</a>	Ready to use Liquid	Caltech Industries
56392-8	Dispatch Hospital Cleaner Disinfectant Towels with Bleach	<a href="#">30</a>	Ready to use Towelette	Caltech Industries
61178-1	D-125	<a href="#">4, 6</a>	soluble concentrate	Microgen Inc.
61178-2	Public Places	<a href="#">4, 6</a>	solution-ready to use	Microgen Inc.
61178-4	Public Places Towelette	<a href="#">4, 6</a>	impregnated materials	Microgen Inc.
61178-5	CCX-151	<a href="#">4, 6</a>	soluble concentrate	Microgen Inc.
61178-6	D-128	<a href="#">4, 6</a>	soluble concentrate	Microgen Inc.
63761-8	Sterilex Ultra Disinfectant Cleaner	<a href="#">4, 6, 15</a>	Soluble concentrate	Sterilex Corporation
66171-1	Advantage 256	<a href="#">1, 3, 16</a>	soluble concentrate	Preserve International
66171-6	Dyne-O-Might	<a href="#">32</a>	soluble concentrate	Preserve International
66171-7	Synergize	<a href="#">7, 13</a>	soluble concentrate	Preserve International
66243-1	Odo-Ban Ready to Use	<a href="#">5</a>	solution-ready to use	Clean Control Corporation
66243-2	Odo-Ban	<a href="#">5</a>	soluble concentrate	Clean Control Corporation
66243-3	Quik Control	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Clean Control Corporation
67619-8	CPPC Ultra Bleach 2	<a href="#">30</a>	Soluble concentrate	Clorox Professional Services Company
67619-9	PJW-622	<a href="#">4, 6</a>	impregnated materials	Clorox Professional Products Co.
67619-13	CPPC Storm	<a href="#">30</a>	Ready to use Liquid	Clorox –professional Services Company
70144-2	Opticide-3 wipes	<a href="#">4, 6</a> >	Ready to Use Towelette	Micro-scientific Industries
70263-6	Microban QGC	<a href="#">5, 9, 10, 19</a>	soluble concentrate	Microban Systems, Inc.
70263-8	Microban Professional	<a href="#">5, 9, 10, 19</a>	solution-ready to use	Microban Systems, Inc.
70627-2	Disinfectant DC 100	<a href="#">4, 6</a>	solution-ready to use	Johnson Diversey, Inc.
70627-6>	Phenolic Disinfectant HG	<a href="#">1, 16</a>	soluble concentrate	Johnson Diversey, Inc.
70627-10	Johnson’s Forward Cleaner	<a href="#">5</a>	soluble concentrate	Johnson Diversey, Inc.
70627-15	Johnson’s Blue Chip Germicidal	<a href="#">5</a>	soluble concentrate	Johnson Diversey, Inc.
70627-21	Virex II 128	<a href="#">5, 9</a>	soluble concentrate	Johnson Diversey, Inc.
70627-22	Virex RTU	<a href="#">5, 9</a>	solution-ready to use	Johnson Diversey, Inc.
70627-23	Virex II 64	<a href="#">5, 9</a>	soluble concentrate	Johnson Diversey, Inc.
70627-24	Virex II 256	<a href="#">5, 9</a>	soluble concentrate	Johnson Diversey, Inc.
71355-1	Virocid	<a href="#">5, 10, 15</a>	soluble concentrate	CID Lines, NV/SA
71654-6	Virkon S	<a href="#">25, 26</a>	soluble concentrate	DuPont Chemical Solutions
71847-2	Klor-Kleen	<a href="#">29</a>	pelletted/tabletting	Medentech, Ltd.
81073-1	Peridox	<a href="#">15, 21</a>	soluble concentrate	Clean Earth Technologies,

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<b>* Active Ingredient</b>	<b>Active Ingredient Key</b>
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, 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

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\*\*Manufacturer Contact Information

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<p>ABC Compounding Co. P.O. Box 16247 Atlanta, GA 30321-0247 (800) 593-1021 (262) 539-1122</p>	<p>Brunlin &amp; Company, Inc P.O. Box 270 Indianapolis, IN 46206-0270 (800) 776-7149 (317) 923-3211</p>	<p>Caltech Industries, Inc. 2420 Schuette Road Midland, MI (800) 234-7700</p>	<p>Canberra Corporation 3610 Holland-Sylvania Road Toledo, OH 43615 (419) 841-6616</p>
<p>Central Solutions, Inc. P.O. Box 15276 3130 Brinkerhoff Road Kansas City, KS 66115 (800) 255-0262 (913) 621-6542</p>	<p>CIDLines, V/SA Waterpootstraat 2 B 8900 IEPER Belgium, Europe 011-32-57-217877</p>	<p>Clean Control Corporation P.O. Box 7444 Warner Robins, GA 31095 (800) 841-3904 (478) 922-5340</p>	<p>Clean Earth Technologies, LLC 13378 Lakefront Drive Earth City, MO 63045 (866) 843-6394 (314) 222-4640</p>
<p>Clorox Professional Products Co. c/o PS&amp;RC P.O. Box 493 Pleasanton, CA 94566-0803 (888) 797-7225 (510) 847-6842</p>	<p>Conklin Co., Inc. Consumer Products Division 551 Valley Park Drive P.O. Box 155 Shakopee, MN 55379-0155 (800) 394-6076 (952) 445-6010</p>	<p>Engelhard Corporation 101 Wood Avenue Iselin, NJ 08830-0770 (202) 393-3903</p>	<p>The Dow Chemical Company Midland, MI 48674 (800) 447-4369 (989) 636-1000</p>
<p>DuPont Chemical Solutions Enterprise P.O. Box 80402 Wilmington, DE 19880 (800) 441-7515</p>	<p>Ecolab, Inc. 370 N. Wabasha Steet St. Paul, MN 55102 (800) 332-6522</p>	<p>Essential Industries, Inc. P.O. Box 12 Merton, WI 53056-0012 (800) 593-1021 (262) 539-1122</p>	<p>Hess &amp; Clark Inc. 110 Hopkins Drive Randolph, WI 53956-1316 (608) 221-7378</p>
<p>H&amp;S Chemicals Division c/o Lonza, Inc. 90 Boroline Road Allendale, NJ 07401 (800) 365-8324 (201) 316-3200</p>	<p>Huntington Professional Products A Service of Ecolab, Inc. 370 N. Wabasha Steet St. Paul, MN 55102 (800) 332-6522</p>	<p>Johnson Diversey, Inc. 8310 16th Street Sturtevant, WI 53177 (800) 851-7145 (262) 631-4001</p>	<p>Lonza, Inc. 90 Boroline Road Allendale, NJ 07401 (800) 365-8324 (201) 316-3200</p>
<p>Mason Chemical Company 721 W. Algonquin Road Arlington Heights, IL 60005 (800) 362-1855 (847) 290-1621</p>	<p>Medentech, Ltd. Whitemill Industrial Estate Clonard Road Wexford, Ireland 353 53 60040</p>	<p>Microban Systems, Inc 1135 Braddock Avenue Braddock, PA 15104 (800) 332-6037 (412) 264-8370</p>	<p>Microgen Inc. 33 Clinton Road Suite 102 West Caldwell, NJ 07006 (800) 420-7522 (973) 575-9025</p>
<p>Micro-Scientific Industries 1225 Carnegie Street Rolling Meadows, IL 60008 (888) 253-2536</p>	<p>Preserve International P.O. Box 10527 Zephyr Cove, NV 89448 (800) 995-1607</p>	<p>The Procter &amp; Gamble Company P&amp;G Household Care 5299 Spring Grove Avenue Cincinnati, OH 45217 (800) 332-7787</p>	<p>Reckitt Benckiser Morris Corporate Center IV 399 Interpace Parkway Parsippany, NJ 07054 (800) 228-4722 (800) 677-9218</p>
<p>Sporicidin International 121 Congressional Lane Rockville, MD 20852 (301) 231-7700</p>	<p>Spray Nine Corporation PO Box 290 Johnstown, NY 12095-0290 (800) 477-7299</p>	<p>Stepan Company 22 West Frontage Road Northfield, IL 60093 (800) 745-7837 (847) 446-7500</p>	<p>SteriFX Inc. 1868 Kings Highway Shreveport, LA 71103 (318) 425-2515</p>
<p>Sterilex Corporation 11409 Cronhill Drive Owing Mills, MD (800) 511-1659</p>	<p>Steris Corporation 7501 Page Avenue St. Louis, MO 63133 (800) 444-9009 Option 4 or Ext. 25064</p>	<p>Virox Technologies, Inc. 2815 Bristol Circle, Unit 4 Oakville, Ontario, L6H 6X5, Canada (800) 387-7578</p>	

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# Appendix L

## United Egg Producers

### Movement Guidelines During AI Infection

May 14, 2007

**United Egg Producers/United Egg Association  
Highly Pathogenic Avian Influenza Movement Control  
Model Plan**

**Movement Protocol for Liquid Egg Product, Further Processed Egg Products, Inedible Egg, Table Eggs and Broken Egg Shells, Egg-Type Hatching Eggs, and Day-Old Chicks Within, Out of, and Into a Control Area**

1.

**Flocks that are found to be infected with highly pathogenic avian influenza (HPAI).**

a.

No movement of susceptible species or their products (e.g., shell eggs, hatching eggs, day old chicks, broken egg shells, unpasteurized liquid egg product, pasteurized egg products) will be allowed off the premises, except for disposal and must be moved under permit.

2.

**Flocks that are deemed to be “Contacts.”**

a.

**Definition of contacts:** A contact premises is a premises with birds or other susceptible animals *or products* that have been exposed directly or indirectly to birds and other animals, products, materials, people, or aerosol from an infected premises (the specific exposure factors to be considered must be appropriate to the epidemiology of HPAI).

b.

Layer industry HPAI at risk flocks include the following.

i.

Premises with susceptible birds exposed to poultry **manure** from an infected flock (virus in manure)

ii.

Premises with susceptible birds exposed to **dead poultry** from an infected flock (virus in carcasses, etc)

iii.

Premises with susceptible birds exposed to **live poultry** from an infected flock (virus in bird & secretions & excretions)

iv.

Premises with susceptible birds exposed to **eggs or egg handling materials** from an infected flock (HPAI virus in and on egg)

v.

Premises with susceptible birds with **unprotected exposure to equipment** that has been in contact with infected birds, manure, carcasses, or eggs. Unprotected means inadequate sanitation procedures for those items/people who come into contact with an infected flock.

vi.

Premises with susceptible birds with **unprotected exposure to people** that have been in contact with infected birds, manure, carcasses, or eggs.

vii.

Premises involved in depopulation of infected flocks.

c.

Minimal contact flocks that are unlikely to involve infected birds include the following.

i.

Premises that are in close proximity to an infected flock but which do not fall into the at risk definition and show no unexplained increase in daily mortality.

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ii.

Locations who receive materials that come in contact with animals or manure but have taken precautions to protect against disease

iii.

Farm workers/visitors who contact animals but who take precautions between farms (e.g. boots, coveralls, hand washing, showers, etc)

iv.

Farms receiving supplies that have been in contact with birds or manure but have been cleaned and disinfected prior to leaving the premises of origin.

v.

Farms receiving equipment that that have been in contact with birds or manure but have been cleaned and disinfected prior to leaving the premises of origin.

d.

Non-contact flocks include the following. Non-Animal contact functions (movement that does not involve contact with animals or manure)

1.

Feed delivery, supplies,

2.

Office workers/visitors who may travel to multiple sites

e.

### **Disposition of Contact Flocks.**

i.

Contact premises will be quarantined and will be subject to strict biosecurity measures, daily monitoring of mortality in each house, and intensive surveillance for HPAI viruses in each house by RRT-PCR testing (see 3 immediately below) for at least 42 days or until the Incident Commander is convinced that no HPAI is present on the premises.

ii.

Contact premises with 75,000 hens or more will not be depopulated until a diagnosis of HPAI has been confirmed by RRT-PCR or by virus isolation.

iii.

Contact premises that prove to be infected will be depopulated immediately.

### **3. Determination of non-infected layer industry flocks in the Control Area.**

a.

The absence of infection will be documented by requiring chickens from flocks that are not exhibiting signs of the disease and that show no unexpected increase in mortality from each house on the farm to be tested each day and found to be negative by the real time reverse transcriptase – polymerase chain reaction (RRT-PCR) or other suitable procedure as determined by the Incident Command.

i.

A minimum of five chickens from the daily mortality and/or from euthanized sick birds from each house (flock) will be placed in a leak proof container (e.g. heavy duty plastic garbage bag) each morning. Each

container will be labeled with the farm of origin, house of origin, and the number of birds found dead in the house that day. The containers will be taken to a designated pick-up point, typically the public road closest to the premises.

1.

Rationale: In a large commercial poultry house (100,000 layers) “normal” mortality will be about 10 per day. A doubling of normal mortality to 20 due to HPAI (dead bird prevalence of 50% and flock prevalence of 0.04%) would be detected by sampling 5 dead birds. Historically, APHIS sampled 5 dead birds **per week** to monitor chicken houses in the END outbreak in CA and this plan requires daily monitoring. The proposed AI plan requires daily monitoring and will be 7 times more effective than the monitoring during the END outbreak. It is not unusual for mortality to fluctuate that much from day to day, so sampling dead/sick birds every day is likely more sensitive than monitoring weekly mortality (where a trend over 2 or 3 days might be observed before acting). It is reasonable to assume that 50% of the sick and dead birds (in a house that is infected with HPAI) would actually be shedding AI virus then a sample size of 5 birds would allow you to have 95% confidence of finding the virus in the sick or dead birds.

ii.

A state or federal regulatory official or an individual authorized by the Incident Command will take a tracheal swab from each chicken. Five tracheal swabs will be pooled in a tube containing brain-heart infusion (BHI) broth. Sample pooling will be done on a per house basis. One BHI tube containing tracheal samples (5 tracheal swabs/BHI tube) will be submitted as directed by the Incident Command to an authorized State Veterinary Diagnostic Laboratory (VDL). These samples must be submitted on the day of sample collection by the state or federal regulatory official or an individual authorized by the Incident Command. The State VDL and the IC will establish the time of day by which samples must be submitted to an authorized VDL (example, by 12:30 pm). VDL personnel will perform RRT-PCR testing on these samples immediately upon receipt and electronically send test results to the Incident Command (IC) by the end of each day. The IC will report the test result information to the premises as soon as it is available.

4.

**Movement of liquid egg product, further processed egg products, inedible egg, table eggs and broken eggshells, egg-type hatching eggs, and day-old chicks from non-infected flocks.**

a.

Movement of liquid egg product, table eggs, egg-type hatching eggs, further processed egg products, and broken egg shells *within and out of* a Control Area will be allowed by permit for those flocks testing negative (see Section 3 above) as follows:

i.

USDA FSIS inspected pasteurized egg products, or precooked egg products produced by plants within a control area may move within or out of the Control Area by Permit (accompanied by documentation of origin of the products). The cargo interior and exterior of the transport vehicle must be cleaned and disinfected. The driver will not be allowed outside the cab or else the cab interior must also be cleaned and disinfected. The tires and wheel wells must also be cleaned and disinfected before leaving the premises within the Control Area.

ii.

Unpasteurized liquid egg product may move in officially FSIS sealed vehicles per 9 CFR Chapter III Part 590.410 from breaking operations within the Control Area directly to pasteurization plants located within or out of the Control Area by permit. The cargo interior and exterior of the transport vehicle must be cleaned and disinfected. The driver will not be allowed outside the cab or else the cab interior must also be cleaned and disinfected. The tires and wheel wells must also be cleaned and disinfected before leaving the premises within the Control Area.

iii.

Inedible egg from graders and/or breaking plants in a Control Area may move by permit for pasteurization or to approved waste disposal sites within or outside the Control Area. The cargo interior and exterior of the transport vehicle must be cleaned and disinfected. The driver will not be allowed outside the cab or else the cab interior must also be cleaned and disinfected. The tires and wheel wells must also be cleaned and disinfected before leaving the premises within the Control Area.

iv.

Washed and graded shell eggs destined for food service, retail marketing, further processing, or for breaking may be moved out of the Control Area by permit if they have been washed and sanitized using 100 – 200 ppm chlorine solution. The transport vehicle shall be sealed by farm or company personnel under the authorization of the Incident Command. Egg handling materials used in the transport of eggs to breaking or further processing plants must be destroyed at the plant or cleaned, sanitized (following accepted procedures) and returned to the premises of origin without contacting materials going to other premises. The cargo interior and exterior of the transport vehicle must be cleaned and disinfected. The driver will not be allowed outside the cab or else the cab interior must also be cleaned and disinfected. The tires and wheel wells must also be cleaned and disinfected before leaving the premises within the Control Area.

v.

Nest run shell eggs (not washed and sanitized) must be moved directly for washing and grading, further processing, or to an off-line breaking operation. The transport vehicle shall be sealed by farm or company personnel under the authorization of the Incident Command. Egg handling materials must be destroyed at the destination plant or cleaned, sanitized (following accepted procedures) and returned to the premise of origin without contacting materials going to other premises. The cargo interior and exterior of the transport vehicle must be cleaned and disinfected. The driver will not be allowed outside the cab or else the cab interior must also be cleaned and disinfected. The tires and wheel wells must also be cleaned and disinfected before leaving the premises within the Control Area.

vi.

Broken eggshells on the farm or from breaking plants, pasteurization plants, and/or further processing plants may be moved by permit. The transport vehicle shall be sealed by farm or company personnel under the authorization of the Incident Command. The cargo interior and exterior of the transport vehicle must be cleaned and disinfected. The driver will not be allowed outside the cab or else the cab interior must also be cleaned and disinfected. The tires and wheel wells must also be cleaned and disinfected before leaving the premises within the Control Area.

vii.

Hatching eggs from source flocks tested negative for AI virus by daily mortality sampling may be moved to hatcheries within the Control Area with a permit. Egg handling materials must be destroyed at the hatchery or cleaned, sanitized (following accepted procedures) and returned to the premise of origin without contacting materials going to other premises. The cargo interior and exterior of the transport vehicle must be cleaned and disinfected. The driver will not be allowed outside the cab or else the cab interior must also be cleaned and disinfected. The tires and wheel wells must also be cleaned and disinfected before leaving the premises within the Control Area.

viii.

Hatching eggs from source flocks tested negative for AI virus by daily mortality sampling may be moved out of the Control Area by permit. The chicks must be placed under a “post-hatch” quarantine for 30 days. Egg handling materials must be destroyed at the premises of destination or cleaned, sanitized (following accepted procedures) and returned to the premise of origin without contacting materials going to other premises. The cargo interior and exterior of the transport vehicle must be cleaned and disinfected. The driver will not be allowed outside the cab or else the cab interior must also be cleaned

and disinfected. The tires and wheel wells must also be cleaned and disinfected before leaving the premises within the Control Area. The State Veterinarian of the state of destination must be faxed a copy of the restricted movement permit within 24 hours of issuance.

ix.

Day-old chicks from source flocks tested negative for AI virus by daily mortality sampling may be shipped by permit within or out of the Control Area and must be placed under a 30 day quarantine. The State Veterinarian of the State of destination must be faxed a copy of the restricted movement permit within 24 hours of issuance. Hatcheries may receive eggs that originate outside the Control Area (accompanied by documents showing the origin of the eggs and the AI negative status of the source flock) without a permit. The cargo interior and exterior of the transport vehicle must be cleaned and disinfected. The driver will not be allowed outside the cab or else the cab interior must also be cleaned and disinfected. The tires and wheel wells must also be cleaned and disinfected before leaving the premises within the Control Area.

x.

The Incident Command or designate will evaluate and approve the risk assessment and risk mitigation procedures necessary to move products by permit. A permit must be issued and seals placed on the vehicle by a state or federal regulatory official or a person authorized by the Incident Command. The Incident Command will authorize procedures to break the seals outside of the control area with proper documentation.

b.

Movement of liquid egg product, shell eggs, broken egg shells, and hatching eggs *into* a Control Area will be allowed without permit under the following conditions:

i.

Pasteurized liquid egg product and unpasteurized liquid egg (and blends) from breaking plants and/or pasteurization plants outside a Control Area (and accompanied by documentation of origin) may move into pasteurization and/or further processing plants located in a Control Area without permit. The driver will not be allowed outside the cab or else the cab interior must be cleaned and disinfected. The exterior of the transport vehicle and the tires and wheel wells must be cleaned and disinfected before leaving the premises in a Control Area.

ii.

Shell eggs may move into breaking, grading, pasteurization, and/or further processing plants from outside Control Areas (accompanied by proof of origin) without a permit. Egg handling materials must be destroyed at the plant or cleaned, sanitized (following accepted procedures) and returned to the premise of origin without contacting materials going to other premises. The driver will not be allowed outside the cab or else the cab interior must be cleaned and disinfected. The exterior of the transport vehicle and the tires and wheel wells must be cleaned and disinfected before leaving the premises within a Control Area.

iii.

Broken egg shells may move into a Control Area (accompanied by proof of origin) without a permit. The driver will not be allowed outside the cab or else the cab interior must be cleaned and disinfected. The exterior of the transport vehicle and the tires and wheel wells must be cleaned and disinfected before leaving the premises within a Control Area.

iv.

Hatching eggs may move into a hatchery from outside Control Areas (accompanied by proof of origin and AI tested negative flocks) without a permit. Egg handling materials must be destroyed at the plant or cleaned, sanitized (following accepted procedures) and returned to the premise of origin without contacting materials going to other premises. The driver will not be allowed outside the cab or else the cab interior must be cleaned and disinfected. The cargo interior and exterior of the transport vehicle and

the tires and wheel wells must be cleaned and disinfected before leaving the premises within a Control Area.

**5.**

**Determination of Release of Movement Restrictions**

**a.**

All premises within the Control Area would be eligible for release from movement restrictions as determined by the Incident Command when:

**i.**

All infected flocks in a Control Area have been depopulated. All depopulated flock premises have been cleaned and disinfected. A minimum of 42 days has passed, or environmental sampling has proven HPAI virus negative status for the depopulated premises.

**ii.**

All contact premises in a control area must have been depopulated or must have been monitored for 42 days.

This plan has been written by egg industry and university personnel based on their knowledge of the egg industry. Standard Operating Procedures from the Exotic Newcastle Disease (END) outbreak were reviewed as a starting point for developing this plan.

## Appendix M

### National Turkey Federation Movement Guidelines

#### During AI Outbreak

## Movement Protocol for Turkey Products Within, Out of, and Into a HPAI Control Area

Movement Protocol Draft  
June 13, 2007

- 1) *Turkey flocks that are found to be positively infected with highly pathogenic avian influenza (HPAI)*
  - i) *No movement of eggs (from breeder farm to hatchery or hatchery to hatchery), poult (from hatchery to brood farm, brood farm to finishing farm), and market birds (from finishing farm to processing plant) is permitted from farms/flocks determined to be positively infected with HPAI.*
  - ii) *Feed should not be delivered to infected farm; litter and semen should not be moved from infected farm/flock. Unless essential because prompt depopulation is not possible.*
- 2) *Determination of non-infected (negative) flocks within the established control zone*
  - i) *No product (eggs, poult, feed, litter, birds, meat, semen, offal) movement can occur in the absence of negative test results conducted within 24 hours prior to movement.*
  - ii) *Biased samples from daily mortality or sick birds should be tested using pharyngeal or tracheal swabs. Samples should be collected from five sick or dead birds, if available, or eleven birds, selected at random, per flock.*
  - iii) *Testing should include either RNA or antigen capture/detection technology*
- 3) *Movement controls for products from non-infected (negative) flocks within and out of the established control zone*
  - i) *Eggs from breeder farm to hatchery:* Eggs may be moved from non-infected farms within the control zone under permit. The non-infected farm must have been tested free of infection with RNA or antigen capture/detection technology as well as via absence of clinical symptoms (drop in egg production). Eleven thin-shelled eggs or samples from five sick or dead birds, if available, or eleven birds should be tested 24-hours prior to movement and at least weekly. Eggs from non-infected farms inside the control zone should be washed using 100-200 ppm chlorine solution or 650 ppm quaternary ammonium chloride prior to movement.
  - ii) *Eggs from hatchery to hatchery:* Eggs at a hatchery within the control zone may be moved to another hatchery under permit provided the eggs' origin is a non-infected farm/flock.

- iii) **Poults from hatchery to brood farm:** Poults from hatchery may move to brood farm in or out of the control zone under permit. If “one-way” transport containers are not utilized, care should be taken to ensure adequate cleaning and disinfection occurs prior to returning containers to the hatchery. Permits will be issued for poults moving from hatchery within control zone to a farm within or outside the control zone that has been determined to be non-infected.
- iv) **Poults from brood farm to finishing farm:** Poults from a non-infected brood farm can be moved to a non-infected finishing farm within or outside the control zone under permit. Poults should be tested negative via RNA or antigen capture/detection technology 24 hours prior to movement. Equipment, materials, and personnel used to transport the poults should be properly cleaning.
- v) **Market birds from finishing farm to processing plant:** Market age birds are permitted to move to processing establishment provided a negative test via RNA or antigen capture/detection technology. Testing should be conducted on daily mortality within 24 hours of movement from farm to processing plant. Sampling on day of load out prior to movement is recommended. Pharyngeal or tracheal swabs from five sick or dead birds, if available, or eleven birds selected at random should be collected per flock.

vi) **Processing Plant**

- (1) **Raw meat to retail:** Raw meat produced within the established control zone from flocks/farms determined to be non-infected within 24 hours of slaughter is allowed to move to retail/commerce. Plant records should demonstrate raw meat is from non-infected farms/flocks within 24 hours of slaughter.
- (2) **Raw meat to further processing:** Raw meat to further processing produced within the established control zone that is destined for further processing (cook facility), is allowed movement and is from non-infected flocks within 24 hours of slaughter.
- (3) **Fully cooked meat to retail:** Fully cooked meat to retail produced within the established control zone are allowed movement to retail/commerce.
- (4) **Offal to rendering:** Offal from processing facilities is allowed movement to rendering plant under permit. Records should demonstrate that the offal is from non-infected flocks, as determined by RNA or antigen capture/detection technology, tested within 24 hours of processing. Equipment, materials, and personnel used to transport the offal should be properly cleaning.

vii) **Other**

- (1) **Feed:** Feed delivery trucks should be thoroughly cleaned and disinfected before leaving control zone. If possible, designated trucks should be used to deliver feed within the control zone. Truck routes should avoid the infected farm/flocks, if possible.
- (2) **Litter:** Movement of new or used litter in CA should be discouraged, if possible.
- (3) **Semen:** If necessary, semen from farms/flocks within the control zone can be moved under permit. Flocks should be tested via pharyngeal or tracheal swabs from five sick or dead birds, if available, or eleven birds selected at random, at a minimum per week for each house.

#### 4) Movement controls for live product pass through

- i) Live product moving through the control zone should be allowed under permit only. If possible, movement through should be avoided. However, should live product need to pass through the control zone, live product can move through via truck under administrative seal.
- ii)

## Appendix N

### Approved Municipal Solid Waste Landfill Sites

Comprehensive Information										
Accept Mortalities	County	Facility Name	Address	City	State	Zip	Contact Last Name	First Name	Telephone	Fax
Y	Alamance	Austin Quarter SWM Facility	SR 2148	Saxapahaw	NC		Cagle	Alvin	336-376-8902	336-376-8937
Y	Anson	Chambers Development MSWLF	Rt. 1 Box 235	Polkton	NC	28134	Roberts	Steve	704-694-6900	704-694-2537
Y	Cleveland	Cleveland County Landfill	1609 Airport Rd.	Shelby	NC	28150	Lockridge	Sam	704-480-5478	704-482-3432
Y	Gaston	Gaston Country Landfill	SR 1001	Dallas	NC		Maxwell	Ray	704-922-0267	704-866-3908
Y	Johnson	Johnson Co Landfill		Smithfield	NC	27577	Proctor	Rick	919-934-4576	919-989-7152
Y	Onslow	Onslow Co Subtitle D Landfill	415 Meadowview Rd.	Jacksonville	NC	28540	Horn	Jim	910-989-2107	910-455-6339
Y	Robeson	Robeson Co Landfill	NC 20/Landfill Rd.	St. Pauls	NC	28384	Baxley	WC	800-682-2014	910-865-5126
Y	Wayne	Wayne Co Landfill	460 B South Landfill Rd.	Dudley	NC	28333	Cook	Lloyd	919-689-2994	
Y	Wilkes	Wilkes Co MSWLF	NC 268 East	Roaring Rive	NC	28669	Livingston	Tommy	336-696-3867	336-696-2923
Y	Sampson	WI - Sampson Co Disposal Inc.	7434 Roseboro Hwy	Roseboro	NC	28382	Mitchell	Troy	910-525-4132	910-525-4150

## Appendix O

### Sampling Protocol for Poultry Compost Piles and Environmental Samples for Avian Influenza

All biosecurity practices required to move people, vehicles and samples in and out of the infected farms will be followed.

#### **Virus Isolation samples from compost piles:**

1. Random samples will be taken ~every 30 feet in a windrow at the first turning of the compost piles in each house on a quarantined farm (total of 10 samples per house).
2. The samples (~25 grams) will be collected individually into 50 ml conical centrifuge tubes containing transport broth with appropriate antibiotics (50% weight to volume).
3. Samples will be further processed at the Rollins Animal Disease Diagnostic Laboratory for virus isolation.
4. The process will be repeated in each house on a quarantined farm 7 days after the first turning of the compost piles. Sampling will be concentrated near the outside edges of the windrows (total of 10 samples per house).
5. Positive VI results will require additional sampling of the compost piles and a delay in movement of the compost from the house.

#### **VI testing of environmental samples:**

1. A company representative will notify the NCDA&CS to request final environmental sampling and walk-thru inspection after the final cleaning and disinfection of the quarantined farm.
2. Swab samples will be taken using swabs and transport medium as described for bird sampling at 10 selected locations (fans, sills, door frames, etc.) in each house on the quarantined farm, creating 2 swab pools of 5 swabs each.
3. Samples will be tested for AI by VI at the Rollins Animal Disease Diagnostic Laboratory.
4. Suspicious or positive results will require additional sampling of the house environment.

#### **Release of Quarantine:**

1. The compost piles in each house on the farm must test negative by VI prior to movement from the house.
2. All environmental samples after final cleaning and disinfection of each house on the farm must be negative by VI.
3. The NCDA&CS Animal Health Technician must approve cleaning and disinfection process by site inspection.

# Appendix P

## Regulations and Methods Governing Appraisal and Indemnification of Depopulated AI-Infected Poultry

(Summary of the National HPAI Response Plan 83 **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.

## 9CFR Part 53

### Indemnity Related to HPAI Depopulation

Title 9--Animals and Animal Products

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CHAPTER I--ANIMAL AND PLANT HEALTH INSPECTION SERVICE,  
DEPARTMENT OF AGRICULTURE

PART 53--FOOT-AND-MOUTH DISEASE, PLEUROPNEUMONIA,  
RINDERPEST, AND CERTAIN OTHER COMMUNICABLE DISEASES OF  
LIVESTOCK OR POULTRY

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- 53.1 Definitions.
  - 53.2 Determination of existence of disease; agreements with States.
  - 53.3 Appraisal of animals or materials.
  - 53.4 Destruction of animals.
  - 53.5 Disinfection or destruction of materials.
  - 53.6 Disinfection of animals.
  - 53.7 Disinfection of premises, conveyances, and materials.
  - 53.8 Presentation of claims.
  - 53.9 Mortgage against animals or materials.
  - 53.10 Claims not allowed.
- 

[Code of Federal Regulations]  
 [Title 9, Volume 1, Parts 1 to 199]  
 [Revised as of January 1, 2000]  
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 [CITE: 9CFR53.1]

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**TITLE 9--ANIMALS AND ANIMAL PRODUCTS**

**PART 53--FOOT-AND-MOUTH DISEASE, PLEUROPNEUMONIA, RINDERPEST, AND CERTAIN OTHER  
COMMUNICABLE DISEASES OF LIVESTOCK OR POULTRY--Table of Contents**

**Sec. 53.1 Definitions.**

Administrator. The Administrator, Animal and Plant Health Inspection Service, or any person authorized to act for the Administrator.

Animal and Plant Health Inspection Service. The Animal and Plant Health Inspection Service of the United States Department of Agriculture (APHIS).

Animals. Livestock, poultry, and all other members of the animal kingdom, including birds whether domesticated or wild, but not including man.

APHIS employee. Any individual employed by the Animal and Plant Health Inspection Service who is authorized by the Administrator to do any work or perform any duty in connection with the control and eradication of disease.

Bird. Any member of the class aves other than poultry.

Department. The United States Department of Agriculture.

Disease. Foot-and-mouth disease, rinderpest, contagious pleuropneumonia, exotic Newcastle disease, highly pathogenic avian influenza, or any other communicable disease of livestock or poultry that in the opinion of the Secretary constitutes an emergency and threatens the livestock or poultry of the United States.

Exotic Newcastle Disease (END). Any velogenic Newcastle disease. Exotic Newcastle disease is an acute, rapidly spreading, and usually fatal viral disease of birds and poultry.

Highly pathogenic avian influenza. (1) Any influenza virus that kills at least 75 percent of eight 4- to 6-week-old susceptible chickens within 10 days following intravenous inoculation with 0.2 ml of a 1:10 dilution of a bacteria-free, infectious allantoic fluid;

(2) Any H5 or H7 virus that does not meet the criteria in paragraph (1) of this definition, but has an amino acid sequence at the hemagglutinin cleavage site that is compatible with highly pathogenic avian influenza viruses; or

(3) Any influenza virus that is not an H5 or H7 subtype and that kills one to five chickens and grows in cell culture in the absence of trypsin.

Inspector in charge. An APHIS employee who is designated by the Administrator to take charge of work in connection with the control and eradication of disease.

Materials. Parts of barns or other structures, straw, hay, and other feed for animals, farm products or equipment, clothing, and articles stored in or adjacent to barns or other structures.

Mortgage. Any mortgage, lien, or other security or beneficial interest held by any person other than the one claiming indemnity.

Person. Any individual, corporation, company, association, firm, partnership, society, joint stock company, or other legal entity.

Pet bird. Any bird that is kept for personal pleasure and is not for sale.

Poultry. Chickens, ducks, geese, swans, turkeys, pigeons, doves, pheasants, grouse, partridges, quail, guinea fowl, and pea fowl.

Secretary. The Secretary of Agriculture of the United States, or any officer or employee of the Department to whom authority has been or may be delegated to act in the Secretary's stead.

State. Each of the States of the United States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, Guam, the Virgin Islands of the United States, or any other territory or possession of the United States.

[61 FR 56882, Nov. 5, 1996]

#### **Sec. 53.2 Determination of existence of disease; agreements with States.**

(a) The Director of Division is hereby authorized to invite the proper State authorities to cooperate with the Department in the control and eradication of any disease within the meaning of Sec. 53.1(f).

(b) Upon agreement of the authorities of the State to enforce quarantine restrictions and orders and directives properly issued in the

control and eradication of such a disease, the Director of Division is hereby authorized to agree, on the part of the Department, to cooperate with the State in the control and eradication of the disease, and to pay 50 percent (and in the case of exotic Newcastle disease or highly pathogenic avian influenza, up to 100 percent) of the expenses of purchase, destruction and disposition of

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animals and materials required to be destroyed because of being contaminated by or exposed to such disease: Provided, however, That if the animals were exposed to such disease prior to or during interstate movement and are not eligible to receive indemnity from any State, the Department may pay up to 100 percent of the purchase, destruction, and disposition of animals and materials required to be destroyed: Provided, further, That the cooperative program for the purchase, destruction, and disposition of birds shall be limited to birds which are identified in documentation pursuant to Cooperative Agreements,\1\ as constituting a threat to the poultry industry of the United States: And provided further, That the Secretary may authorize other arrangements for the payment of such expenses upon finding that an extraordinary emergency exists.

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\1\ Agreements between the Departments and the particular State involved relating to cooperative animal (including poultry) disease prevention, control, and eradication.

[37 FR 5689, Mar. 18, 1972, as amended at 49 FR 3448, Jan. 27, 1984; 49 FR 26712, June 29, 1984; 61 FR 56883, Nov. 5, 1996]

**Sec. 53.3 Appraisal of animals or materials.**

(a) Animals affected by or exposed to disease, and materials required to be destroyed because of being contaminated by or exposed to disease shall be appraised by an APHIS employee and a representative of the State jointly, or, if the State authorities approve, by an APHIS employee alone.

(b) The appraisal of animals shall be based on the fair market value and shall be determined by the meat, egg production, dairy or breeding value of such animals. Animals may be appraised in groups providing they are the same species and type and providing that where appraisal is by the head each animal in the group is the same value per head or where appraisal is by the pound each animal in the group is the same value per pound.

(c) Appraisals of animals shall be reported on forms furnished by APHIS. Reports of appraisals shall show the number of animals of each species and the value per head or the weight and value by pound.

(d) Appraisals of materials shall be reported on forms furnished by APHIS. Reports of appraisals of materials shall, when practicable, show the number, size or quantity, unit price, and total value of each kind of material appraised.

(21 U.S.C. 112, 113, 115, 117, 120, 121, 134b)

[28 FR 5935, June 13, 1963, as amended at 35 FR 13981, Sept. 3, 1970; 36 FR 25217, Dec. 30, 1971; 56 FR 51974, Oct. 17, 1991]

**Sec. 53.10 Claims not allowed.**

(a) The Department will not allow claims arising under the terms of this part if the payee has not complied with all quarantine requirements.

(b) Expenses for the care and feeding of animals held for destruction will not be paid by the Department, unless the payment of such expense is specifically authorized or approved by the Administrator.

(c) The Department will not allow claims arising out of the destruction of animals or materials unless they shall have been appraised as prescribed in this part and the owners thereof shall have executed a written agreement to the appraisals.

(d) The Department will not allow claims arising out of the destruction of animals or materials which have been moved or handled by the owner thereof or its officer, employee, or agent, acting within the scope of his or its office, employment or agency, in violation of a law or regulation administered by the Secretary for the prevention of the introduction into or the dissemination within the United States of any communicable disease of livestock or poultry for which the animal or material was destroyed, or in violation of a law or regulation for the enforcement of which the Secretary enters or has entered into a cooperative agreement for the control and eradication of such disease.

[28 FR 5935, June 13, 1963, as amended at 45 FR 86411, Dec. 31, 1980; 56 FR 51974]

**Sec. 53.4 Destruction of animals.**

(a) Animals affected by or exposed to disease shall be killed promptly after appraisal and disposed of by burial or burning, unless otherwise specifically provided by the Administrator in extraordinary circumstances.

(b) The killing of animals and the burial, burning, or other disposal of carcasses of animals pursuant to the regulations in this part shall be supervised by an APHIS employee who shall prepare and transmit to the Administrator a report identifying the animals and showing the disposition thereof.

[28 FR 5935, June 13, 1963, as amended at 56 FR 51974, Oct. 17, 1991]

**Sec. 53.5 Disinfection or destruction of materials.**

(a) In order to prevent the spread of disease, materials contaminated by or exposed to disease shall be disinfected: Provided, however, That in all cases in which the cost of disinfection would exceed the value of the materials or disinfection would be impracticable for any reason, the materials shall be destroyed, after appraisal as provided in Sec. 53.3.

(b) The disinfection or destruction of materials under this section shall be under the supervision of an APHIS employee who shall prepare and transmit to the Administrator a certificate identifying all materials which are destroyed, showing the disposition thereof.

[28 FR 5935, June 13, 1963, as amended at 56 FR 51974, Oct. 17, 1991]

**Sec. 53.6 Disinfection of animals.**

Animals of species not susceptible to the disease for which a quarantine has

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been established, but which have been exposed to the disease, shall be disinfected when necessary by such methods as the Administrator shall prescribe from time to time.

[28 FR 5935, June 13, 1963, as amended at 56 FR 51974, Oct. 17, 1991]

**Sec. 53.7 Disinfection of premises, conveyances, and materials.**

All premises, including barns, corrals, stockyards and pens, and all cars, vessels, aircraft, and other conveyances, and the materials thereon, shall be cleaned and disinfected under supervision of an APHIS employee whenever necessary for the control and eradication of disease. Expenses incurred in connection with such cleaning and disinfection shall be shared according to the agreement reached under Sec. 53.2 with the State in which the work is done.

[28 FR 5935, June 13, 1963, as amended at 56 FR 51974, Oct. 17, 1991]

**Sec. 53.8 Presentation of claims.**

Claims for (a) compensation for the value of animals, (b) cost of burial, burning or other disposition of animals, (c) the value of material destroyed, and (d) the expenses of destruction, shall each be presented, through the inspector in charge, to APHIS on separate vouchers in form approved by the Administrator.

[28 FR 5935, June 13, 1963, as amended at 56 FR 51974, Oct. 17, 1991]

**Sec. 53.9 Mortgage against animals or materials.**

When animals or materials have been destroyed pursuant to the requirements contained in this part, any claim for indemnity shall be presented on forms furnished by APHIS on which the owner of the animals or materials shall certify that the animals or materials covered thereby, are, or are not, subject to any mortgage as defined in this part. If the owner states there is a mortgage, forms furnished by APHIS shall be signed by the owner and by each person holding a mortgage on the animals or materials, consenting to the payment of any indemnity allowed to the person specified thereon.

[28 FR 5935, June 13, 1963, as amended at 56 FR 51974, Oct. 17, 1991]

**Sec. 53.10 Claims not allowed.**

(a) The Department will not allow claims arising under the terms of this part if the payee has not complied with all quarantine requirements.

(b) Expenses for the care and feeding of animals held for destruction will not be paid by the Department, unless the payment of such expense is specifically authorized or approved by the Administrator.

(c) The Department will not allow claims arising out of the destruction of animals or materials unless they shall have been appraised as prescribed in this part and the owners thereof shall have executed a written agreement to the appraisals.

(d) The Department will not allow claims arising out of the destruction of animals or materials which have been moved or handled by the owner thereof or its officer, employee, or agent, acting within the scope of his or its office, employment or agency, in violation of a law or regulation administered by the Secretary for the prevention of the introduction into or the dissemination within the United States of any communicable disease of livestock or poultry for which the animal or material was destroyed, or in violation of a law or regulation for the enforcement of which the Secretary enters or has entered into a cooperative agreement for the control and eradication of such disease.

[28 FR 5935, June 13, 1963, as amended at 45 FR 86411, Dec. 31, 1980; 56 FR 51974]

## **9CFR Part 56 Indemnity Related to LPAI Depopulation**

### **Indemnity**

#### **PROPOSED – NOT YET FINAL**

#### **Part 56 Control of H5/H7 Low Pathogenic Avian Influenza**

##### **§56.1 Definitions**

**Administrator.** The Administrator, Animal and Plant Health Inspection Service, or any other employee of the Animal and Plant Health Inspection Service, United States Department of Agriculture, delegated to act in the Administrator's stead.

**Animal and Plant Health Inspection Service-** The Animal and Plant Health Inspection Service of the U.S. Department of Agriculture.

**H5/H7 Low pathogenic avian influenza (LPAI).** An infection of poultry caused by an influenza A virus of H5 or H7 subtype which has an IVPI in 6 week-old chickens less than 1.2 or any infection with influenza A viruses of H5 or H7 subtype for which nucleotide sequencing has not demonstrated the presence of multiple basic amino acids at the cleavage site of the hemagglutinin.

**H5/H7 low pathogenic avian influenza (LPAI) virus infection.**

- 1) AI virus has been isolated and identified as such from poultry or a product derived from poultry, or
- 2) viral antigen or viral RNA specific to H5 or H7 subtype of AI virus has been identified in samples of poultry or a product derived from poultry, or
- 3) antibodies to H5 or H7 subtype of AI virus that are not a consequence of vaccination have been detected.

**Commercial Table-Egg Layer Flock.** – All poultry of one kind of mating and of one classification in one barn or house.

Department. The U.S. Department of Agriculture.

Domesticated. Propagated and maintained under the control of a person.

Flock. As applied to commercial poultry. All poultry of one kind of mating and of one classification on one farm.

Commercial Table-Egg Layer Premises – all contiguous flocks under common ownership.

Initial State Response and Containment Plan. A state should have a standing emergency disease management committee, regular meetings, and exercises. There should be minimum biosecurity plan followed by all commercial producers. The state should have public awareness and education programs in regards to avian influenza. A state should have detailed, specific procedures for initial handling and investigation of suspicious cases of H5/H7 LPAI. There should be detailed, strict quarantine measures for presumptive and confirmed index cases. Each State should have appropriate control/monitoring zones, contact surveys, and movement restriction. There should be provisions for monitoring activities in control zones. There should be adequate diagnostic resources. It is recommended that there are detailed plans for disposal of infected flocks. There should be plans for Virus negative flocks that provides for quarantine, testing, and controlled marketing. There should be detailed plans for carcass disposal, preexisting agreements with regulatory agencies, disposal sites, and resources. A state should have detailed plans for cleaning and disinfection of premises, repopulation, and monitoring after repopulation. If vaccination may be an option, there needs to be a written plan for use in place with proper controls and USDA approval. States will be responsible to make the determination to request Federal assistance and States with active cases will be delisted during and for 30 days after the last case. Each state should have detailed, specific procedures for reporting test results that are developed after appropriate consultation with commercial poultry producers in the state, and that provide for the reporting only of confirmed cases of H5/H7 LPAI.

Flock Plan. A written flocks management agreement developed by APHIS with input from the flock owner, State representatives, and other affected parties. A flock plan sets out the steps to be taken to eradicate LPAI from the positive flock, or to prevent introduction of LPAI into another flock. A flock plan shall include but not limited to poultry and poultry product movement, geographically appropriate infected and control/monitoring zones, control measures should center on safe handling of conveyances, containers, and other associated materials that could serve as fomites, details of increased monitoring, detailed plans for disposal of flocks, detailed plans for cleaning and disinfection, downtime and plans for repopulation.

Mortgage. Any mortgage, lien, or other security or beneficial interest held by any person other than the one claiming the indemnity.

Official Appraiser (APHIS official appraiser, State official appraiser). A person authorized by APHIS or a State to appraise animals for the purpose of this part. An official appraiser

Official State Agency. The State authority recognized by the Department to cooperate in the administration of the Plan.

Plan. The provisions of the National Poultry Improvement Plan contained in this part.

Reactor. A bird that has a positive reaction to a test, required in parts 146 & 147 of this chapter, for plan disease program.

Secretary. The Secretary of Agriculture of the United States, or any officer or employee of the Department delegated to act in the Secretary's stead.

Suspect flock. A flock shall be considered, for the purposes of Plan, to be a suspect flock if any evidence exists that it has been exposed to LPAI.

State. Any State, the District of Columbia, or Puerto Rico.

State Inspector. Any person employed or authorized to perform functions under this part.

### **Subpart A—H5/H7 Low Pathogenic Avian Influenza Indemnification Program**

#### **§56.2 Payment of indemnity**

- a) The administrator is authorized to pay for the purchase, destruction of, or control of H5/H7 LPAI infected, LPAI exposed and LPAI suspect commercial table-egg layers, meat-type chickens and meat-type turkeys and egg-and meat-type breeding chickens, and breeding turkeys that participate in the “U.S. H5/H7 Avian Influenza Monitored” program of the NPIP, are located in a State that participates in the NPIP diagnostic surveillance program for H5/H7 LPAI and has a USDA, APHIS, approved initial state response and containment plan for H5/H7 LPAI. The amount of the Federal payment for any such poultry will be 100 percent of emergency program costs

#### **§56.3 Appraisal and destruction of poultry.**

- a) H5/H7 LPAI positive birds or exposed birds removed by APHIS from a flock for testing, will be appraised by an APHIS official appraiser and a State official appraiser jointly, or if APHIS and State authorities agree, by either a State official appraiser or an APHIS official appraiser alone.
- b) The appraisal of poultry will be the fair market value of the birds, including in the case of laying hens the birds projected future egg production. Indemnity should also include the purchase at fair market value of eggs produced or destroyed during the diagnosis of H5 or H7 LPAI.
- c) Appraisals of poultry must be reported on forms furnished by APHIS and signed by the appraisers, and signed by the owners of the poultry to indicate agreement with the appraisal amount. Reports of appraisals must show the number of birds and the value per head.
- d) The disposition of the indemnified poultry must comply with the State’s Federally approved initial response plan for H5/H7 LPAI.

#### **§56.4 Disinfection of premises, conveyances, and materials.**

After the removal of all poultry from a H5/H7 LPAI infected premises, all buildings, pens, cages, conveyances and all other materials on the premises used to house or transport the poultry must be cleaned and disinfected in compliance with §147.24 of this chapter under the supervision of the official state agency. Premises may not be restocked with poultry until after the date specified in the initial response plan required by §56.3(d). The owner to whom the indemnity is paid will be responsible for expenses incurred in connection with the cleaning and disinfection, except that APHIS or a State will pay for the cleaning and disinfection of the conveyances used to transport the poultry to the location of disposition. However, APHIS may also decide to pay the cost of cleaning and disinfecting premises when the procedures needed to conduct effective cleaning and disinfection are unusually extensive and require methods that are not normally available on a premises. For example, normal procedures would include washing surfaces with high-pressure hoses and disinfectants and burying or burning contaminated materials. Unusually extensive procedure would include disposing of contaminated materials by digestive disposal or high temperature incineration.

#### **§56.5 Presentation of claims for indemnity.**

Claims for indemnity for the value of poultry destroyed due to infection with H5/H7 LPAI must be documented on a form furnished by APHIS and presented to an APHIS employee or the State representative authorized to accept the Claims.

#### **§56.6 Mortgage against poultry.**

When poultry have been destroyed under this part, any claim for indemnity must be presented on forms furnished by APHIS. The owner of the poultry must certify on the forms that the poultry covered are, or are not, subject to any mortgage as defined in this part. If the owner states there is a mortgage, the owner and each person holding a mortgage on the poultry must sign, consenting to the payment of indemnity to the person specified on the form.

#### **§56.7 Claims not allowed.**

- a) The Department will not allow claims arising out of the destruction of poultry unless the poultry have been appraised as prescribed in this part and the owners have signed the appraisal form indicating agreement with the appraisal amount as required by §56.3I of this part.

- b) The Department will not allow claims arising out of the destruction of poultry unless the owners have signed a written agreement with APHIS in which they agree that if they maintain poultry in the future on the premises used for poultry for which indemnity is paid, they will maintain the poultry in accordance with a plan set forth by the official state agency and will not introduce poultry onto the premises until after the date specified by the official state agency. Persons who violate this written agreement may be subject to civil and criminal penalties.
- c) The Department will not allow claims arising out of the destruction of poultry that have been moved or handled by the owner or a representative of the owner in violation of a law or regulation administered by the Secretary regarding H5/H7 LPAI, or in violation of a law or regulation for which the Secretary has entered into a cooperative agreement.

# Appendix Q

## AVMA/USDA APHIS Guidelines

### for Water-Based Foam Depopulation of Poultry

#### General AVMA policies

Use of Water-Based Foam for Depopulation of Poultry  
(Approved by AVMA Executive Board November 2006)

The AVMA supports the use of water-based foam as a method of mass depopulation for poultry in accord with the conditions and performance standards outlined by the US Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS). The following summarizes the conditions under which USDA-APHIS has approved the use of water-based foam for depopulation of poultry:

Use of water-based foam is considered an appropriate method of depopulation of floor-reared poultry (i.e., broiler chickens and turkeys) in accord with USDA-APHIS performance standards ("USDA-APHIS Performance Standards for the Use of Water-Based Foam as a Method of Mass Depopulation of Domestic Poultry" [Attachment A]); and  
Animals are infected with a potentially zoonotic disease; or

Animals are experiencing an outbreak of a rapidly spreading infectious disease that, in the opinion of state or federal regulatory officials, cannot be contained by conventional or currently accepted means of depopulation; or

Animals are housed in structurally unsound buildings that would be hazardous for human entry, such as those that may result from a natural disaster.

Mass depopulation refers to methods by which large numbers of animals must be destroyed quickly and efficiently with as much consideration given to the welfare of the animals as practicable, but where the circumstances and tasks facing those doing the depopulation are understood to be extenuating.

Euthanasia involves transitioning an animal to death in a manner that is as painless and stress-free as possible. The AVMA currently considers that destruction of poultry using water-based foam is a method of mass depopulation and not a form of euthanasia. The AVMA supports additional research to evaluate whether water-based foam can be accepted as a form of euthanasia.

## Attachment A

USDA APHIS Performance Standards for the Use of Water-based Foam as a Method of Mass Depopulation of Domestic Poultry (These dynamic Performance Standards are currently based on objective and subjective measurement. They are intended to be guidelines used to evaluate any type of water-based foam and foam delivery system used for depopulation of poultry until such time that sufficient biometric, engineering, and welfare data can be gathered to establish thorough performance standards.)

In order to comply with current animal welfare considerations and optimal operating procedures, USDA APHIS has developed these minimum standards which all water-based foam systems used for mass depopulation of poultry must meet or exceed by performance measurement until further notice.

The field application of water-based foam used for depopulation as stipulated by these standards is currently approved for use with floor-reared poultry and as conditionally stipulated in Standard 11. Floor-reared poultry is defined as poultry not housed in cages (e.g. broiler chickens and turkeys), but may not necessarily include all types of poultry (e.g. waterfowl, see Standard 11). Approved experimental protocols to adapt this method for use in caged poultry (e.g. laying hens) and broaden its application to other poultry types are not restricted by the official position of USDA APHIS on the use of water-based foam for depopulation of poultry nor these standards. Note that these standards will be revised as further information becomes available.

Water-based foams used for depopulation must be:

readily available;  
environmentally safe;  
biodegradable;  
compatible with carcass disposal methods;  
as non-irritating as possible to poultry mucosa; and  
of no significant risk to human health

Foam delivery systems must produce foam that is of the appropriate consistency and density to completely occlude the upper airway of domestic poultry; so that when immersed

in the foam, airway occlusion occurs in a rapid and overwhelming manner such that birds do not unduly struggle. At this time, the desired bubble size from water-based foam used for poultry depopulation should not exceed 0.625 inches (1.58 cm) and preferably should be smaller. Note: Bubble diameters exceeding 0.33 inches (0.84 cm) may not be appropriate for the depopulation of all types of poultry or may not provide 100% depopulation of the target birds. It is intended that systems developed pursuant to this Standard will provide broad species depopulation capability, but may be limited by the developer to specific species or applications. If the foam used to depopulate does not meet the requirements as stipulated in Standard 9, then its use must be limited to those types of poultry where it has been shown to meet the criteria in Standard 9.

The water-based foam must be fluid enough:

to engulf or negotiate any building supports or structures,  
to surround the birds without cavitations that may be generated by bird movement, and  
be of a consistency (fluidity) that is readily inspired by the birds.

Fluidity in foam is equated to the expansion ratio and the moisture content; to be suitable for depopulation of poultry, the expansion ratio required ranges from 25:1 to 140:1. Note that foams exhibiting expansion ratios exceeding 120:1 may not be appropriate for depopulating all types of floor-reared poultry. Importantly, foam exhibiting expansion ratios below approximately 35:1 may not accumulate to sufficient depth to cover the target species. If the foam used to depopulate does not meet the requirements as stipulated in Standard 9, then its use must be limited to those types of poultry where it has been shown to meet the criteria stipulated in Standard 9.

The water-based foam must have sufficient body to be able to accumulate to at least 6 inches (15 cm) over the mean height of the types of poultry being depopulated. In cases such as full grown turkeys depths up to at least 54 inches (137 cm) may be required.

The application of the water-based foam must be performed in a manner that disturbs the birds as little as possible and avoids panic, "piling" or overcrowding.

Water-based foam of the proper consistency as outlined in sections 2-4 must be capable of being generated using a wide variety of water qualities across a broad range of dissolved solids, salinities, pH, and hardness factors. It is important to note that at present, the primary limiting factor of the speed at which the depopulation event can be conducted, is the availability of an adequate water supply at the site of depopulation.

Water-based foam must demonstrate a residency time (persistence) of no less than 30 minutes (regardless of climatic conditions or solar exposure) to ensure that all birds have been properly dispatched.

In terms of the time to death and total percentage of the population killed when water-based foam is used on any type or age of poultry, the foam system employed must result in the death of 95% of the birds within 7 minutes or less after the birds have been completely submerged in the foam. If 100% of the birds have not been depopulated after 15 minutes post-submergence, then contingencies must exist to dispatch the birds as humanely and quickly as possible in accordance to currently accepted euthanasia methods.

Water-based foam delivery systems must perform reliably and reproducibly in accordance with the criteria detailed in performance Standards 2-9 under a wide range of climatic and operating conditions. Climatic conditions may include ambient indoor temperatures ranging from 0° C (32° F) to 44° C (110° F) and relative humidity ranging from 10% to 100%.

Poultry housing situations vary widely including large surface areas and multistory housing. Strategies must be developed to address these variances before attempting to depopulate with foam.

There are many species of fowl, including waterfowl (e.g. ducks and geese) and other gallinaceous birds (e.g. guineas and quail) used for food, eggs, or other purposes where

current data on the use of water-based foam for depopulation are lacking. However, water-based foam may be conditionally used in depopulating these particular types of fowl if:

the foam and delivery system meets the criteria detailed in Standards 2-10 and, the system demonstrates killing times, killing rates, behavioral responses, and physiological responses comparable to those which would normally be observed when water-based foam is used to depopulate common farm-reared poultry where foaming has been shown to be effective (i.e. broiler chickens and turkeys).

However during the foaming of species where reaction to foam is unknown, if adverse reactions are observed that are more extreme than those seen with farm-reared poultry (i.e. broiler chickens or turkeys), or prolonged killing times or killing rates not consistent with Standard 9 are encountered, then foam should not be used to depopulate that particular species of fowl. If a question of suitability on the use of foam in a particular species arises, then the determination of whether foam may be applied to a particular species will be made by the USDA Incident Commander and the ranking USDA Animal Welfare officer detailed to the outbreak, or the State Veterinarian.

Components of water-based foam delivery systems must be able to withstand chemical disinfection, and all parts of the water-based foam delivery system that enter contaminated houses must be able to withstand stringent cleaning and decontamination measures. In some cases the water-based foam may also be used for decontamination purposes.

Water-based foam delivery systems should either be adaptable for multiple types of poultry housing or be marketed for use that is limited to specific types of poultry and/or housing.

Water-based foam delivery systems should be portable and constructed of components that are easily serviceable and/or replaceable. Portable by this standard is intended to mean easily transportable from one site to another by any conventional means.

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## Appendix R

### Sample Size Protocol

### for AI Testing Poultry Flocks

Number of Birds in population	Number of Samples Required
125,000 or less	11
125,001-150,000	14
150,001-175,000	16
175,001-200,000	18
200,001-225,000	20
225,001-250,000	22
250,001-275,000	25

Using the formula  $n = (1 - (1 - B)^{1/d})((N - d/2) + 0.5)$

Where: n = sample size

B = Confidence level (95% or 0.95)

N = Population size

d = assumed number infected within population (assumption is 25%)

$(1 - B)^{1/d}$  is rounded to 4 significant digits

# Appendix S

## Worker Health

Surveillance and monitoring of workers will be managed by NC Division of Public Health through the Incident Command System.

- All workers will complete an AI Exposure Symptom Questionnaire before going on site at the time of the event.
- Workers involved with the event will be followed up with the same questionnaire at Day 7 and Day 14 of the event.
- Local and state health departments will follow-up any reports of poultry workers exposed to AI who develop symptoms after an event.
- Evaluation of ill workers will be coordinated with the individual's healthcare provider, with the state and local health department providing consultation as needed.
- Specimen collection will be coordinated by the state and local health department.

# Training Checklist for Workers Exposed to Avian Influenza (AI) Virus Infected Live Poultry or Premises Contaminated With Avian Influenza Virus

Adapted with permission from  
Delmarva Poultry Industries- Health Departments  
Joint Task Force

Please read, circle appropriate response, and initial each item below. Sign form at bottom when completed.

\_\_\_\_\_ 1. I **understand/do not understand (circle one)** that avian influenza (AI) can infect humans, although the risk of infection is very low.

\_\_\_\_\_ 2. I **understand/do not understand (circle one)** that these guidelines provided by my employer are the recommendations of the Centers for Disease Control and Prevention (CDC) for maximum protection for workers exposed to AI virus and that these precautions are being taken for my personal protection against the extremely low risk of human infection with AI virus.

\_\_\_\_\_ 3. I **have/have not (circle one)** completed Part 1 of the *Surveillance Form for Persons Involved in Avian Influenza Outbreak Control* prior to entering the entering the premise where AI is suspected or has been confirmed.

\_\_\_\_\_ 4. I **have/have not (circle one)** received the seasonal human flu vaccine at least two weeks prior to today.

\_\_\_\_\_ 5. I **understand/do not understand (circle one)** that this vaccination will not prevent human infection by AI viruses but is intended to minimize the likelihood of an AI virus from recombining with human influenza viruses.

\_\_\_\_\_ 6. I **have/have not (circle one)** been offered antiviral medications and **agree/do not agree (circle one)** to take them as directed by medical professionals.

\_\_\_\_\_ 7. I **agree/do not agree (circle one)** to wear the personal protective equipment (PPE) recommended by my employer at all times during possible exposure to AI virus. This PPE includes but is not limited to: cloth gloves over nitrile disposable gloves (replace gloves immediately if torn or otherwise damaged), discardable clothing and footwear or washable boots that can be cleaned and disinfected on site, safety goggles, disposable particulate N-95 type respirator, and hair bonnet.

\_\_\_\_\_ 8. I **have/have not (circle one)** been instructed on how to properly remove contaminated PPE to prevent cross contamination.

\_\_\_\_\_ 9. I **have/have not (circle one)** been fit tested and approved to wear an N-95 respirator during the completion of physically strenuous activities.

\_\_\_\_\_ 10. I **have/have not (circle one)** been instructed about the importance of strict adherence to and proper use of hand hygiene after contact with AI infected poultry or AI virus contaminated surfaces. After removing protective gloves I **agree/do not agree (circle one)** to thoroughly wash my hands with soap and water for at least 15 seconds or to use other hand disinfection procedures as specified by the Medical Officer.

\_\_\_\_\_ 11. I **agree/do not agree (circle one)** to shower at the end of the work shift in a decontamination unit on site or via other arrangements.

\_\_\_\_\_ 12. I **understand/do not understand (circle one)** that I am not to wear clothing worn in an AI contaminated environment home. This includes shoes and underwear.

\_\_\_\_\_ 13. I **agree/do not agree (circle one)** to assist the health department with completing the *Surveillance Form for Persons Involved in Avian Influenza Outbreak Control* attached health questionnaire on or about day 2 and again on day 7 after possible exposure to AI virus.

\_\_\_\_\_ 14. If I answer "yes" to any question I **agree/do not agree (circle one)** to be referred for evaluation and specimen collection as needed.

\_\_\_\_\_ 15. I **agree/do not agree (circle one)** to follow additional directions from the health department if instructed to do so.

\_\_\_\_\_ 16. I **understand/do not understand (circle one)** that both Safety and Medical Officers will be on site to answer any questions that I may have concerning these guidelines.

Printed Name: \_\_\_\_\_ Date: \_\_\_\_\_

Signature: \_\_\_\_\_

# Appendix T

## Sample Public Health Forms

Case ID \_\_\_\_\_

### Surveillance Form for Persons Involved in Avian Influenza Outbreak Control

#### Part 1: THIS SECTION TO BE COMPLETED BY MEDICAL OFFICER ON SITE

Name: (Last) \_\_\_\_\_ (First) \_\_\_\_\_

Address (# Street Name): \_\_\_\_\_

City: \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

County of Residence: \_\_\_\_\_

Home Phone: \_\_\_\_\_ Work/cell phone: \_\_\_\_\_

Primary Language Spoken \_\_\_\_\_

Age (Years): \_\_\_\_\_ DOB (mm/dd/yy): \_\_\_\_\_

Gender:  M  F

**Work Information:**

Occupation: \_\_\_\_\_

Employer: \_\_\_\_\_

Poultry Company       Private contractor       State/Federal Agency       Other

**Type of work (check all that apply):**

- Care of live poultry
- Clean of poultry houses, cages or trucks
- Composting dead poultry
- Obtaining blood samples of poultry
- Slaughter poultry (not depopulation)
- Farm owner / family
- Other \_\_\_\_\_
- Transportation of live poultry
- Obtain cloacal or oropharyngeal swabs
- Disinfecting equipment
- Process poultry specimens in a lab
- Poultry depopulation
- Other farm work

**Baseline Health Assessment**

**Are you currently having any of the following symptoms?**

- fever       cough       sore throat
- headache       diarrhea       red, burning or watery eyes
- other \_\_\_\_\_

**Vaccination Information:**

**Have you received an influenza vaccination this year?**

No       Yes      Vaccination date \_\_\_\_\_  
What type?  Flu shot  FluMist

**Do you have a prescription for oseltamivir (Tamiflu)?**

No       Yes      **Have you taken your first dose today?**       Yes       No

**Part 2: THIS SECTION TO BE COMPLETED BY HEALTH DEPARTMENT**

Exposure Date (mm/dd/yy): \_\_\_\_\_ Exposure Location \_\_\_\_\_

**Did you use personal protective equipment (PPE) while performing avian influenza outbreak control and eradication activities?**

Yes, always       Yes, most of the time       Yes, some of the time       Never

**If you used PPE, which articles did you use? (Check all that apply)**

- Protective clothing (such as disposable clothing)       Disposable gloves
- Fit-tested respirator (such as an N95 mask)       Hair bonnet
- Disposable protective foot wear or washable boots       Goggles
- Other \_\_\_\_\_

**Follow up Health Assessment:**

Since your control and eradication activities on \_\_\_\_\_ (date), have you developed any of the following symptoms?

Symptoms	Day 2 (Today's Date: _____)			Day 7 (Today's Date: _____)		
	Circle One	Date of Onset	Date Resolved	Circle One	Date of Onset	Date Resolved
Fever	Yes No			Yes No		
Measured Temp $\geq$ 100°F	Yes No Temp°:			Yes No Temp°:		
Cough	Yes No			Yes No		
Sore Throat	Yes No			Yes No		
Runny Nose	Yes No			Yes No		
Body Aches *	Yes No			Yes No		
Red, Burning or Watery Eyes	Yes No			Yes No		
Diarrhea	Yes No			Yes No		
Headache	Yes No			Yes No		
Other: _____	Yes No			Yes No		
Other: _____	Yes No			Yes No		

\* this symptom by itself does not necessitate referral for follow up

**How many days did you take the antiviral medication oseltamivir (Tamiflu)? \_\_\_\_\_ days**

**Did you seek medical care for your illness?**  No       Yes

If yes, name of provider: \_\_\_\_\_ Phone Number: \_\_\_\_\_

**Were you hospitalized for this illness?**  No       Yes

If yes, Name of Hospital \_\_\_\_\_ Date of admission \_\_\_\_\_

**Have any of your family members or other close contacts developed any of the above symptoms?**

No       Yes      If yes, who?

Name                                      Age (Yrs.)                                      Relationship                                      Contact #

**Part 3.**

# MEMO

**To:** (Medical Provider)  
**From:** \_\_\_\_\_ County Health Department  
**Date:** \_\_\_\_\_  
**Re:** \_\_\_\_\_ (patient name)

The person identified above is referred to you for evaluation and follow-up due to their exposure to laboratory confirmed Avian Influenza. An interview with the patient revealed the following information:

- Interview date \_\_\_\_\_
- Exposure date \_\_\_\_\_
- Duties leading to this exposure included: \_\_\_\_\_
- Symptoms began on \_\_\_\_\_
- Symptoms include \_\_\_\_\_
- This patient ( ) has ( ) has not been vaccinated with the current season's influenza vaccine.
- This patient ( ) has ( ) has not receive antiviral prophylaxis during the exposure period.

*CDC Interim Guidance for Protection of Persons Involved in US Avian Influenza Outbreak Disease Prevention and Control and Eradication Activities* ([www.cdc.gov/flu/avian/professional/protect-guid.htm](http://www.cdc.gov/flu/avian/professional/protect-guid.htm)) recommends the following evaluation of ill workers:

- Workers who develop a febrile respiratory illness should have a respiratory sample (e.g., nasopharyngeal swab or aspirate) collected.
- Optimally, an acute- (within 1 week of illness onset) and convalescent-phase (after 3 weeks of illness onset) serum sample should be collected and stored locally in case testing for antibody to the avian influenza virus should be needed.

The Health Department can assist you in submitting a nasopharyngeal swab and serology for Avian Influenza testing to the state laboratory. If you would like a copy of the CDC guidelines, have questions, or need additional information, please contact the Communicable Disease staff at (phone number).

# Appendix U

## Sample Press Releases

### Press Release 1: Notification of Positive Farm

DRAFT DOCUMENT  
AVIAN INFLUENZA BIOSECURITY ALERT

A \_\_\_\_\_ farm in \_\_\_\_\_, NC has tested positive for (H?N?) avian influenza.

This discovery means all persons having any direct contact with the NC poultry industry need to implement strict biosecurity measures as their standard operating procedures to help prevent the spread of the virus.

Companies, agencies, organizations and individuals that provide products or services to poultry operations should stay off the farms unless they have emergency business there. Try to conduct all business via e-mail, telephone or by any other non-physical contact.

Everyone's cooperation and vigilance is greatly needed and appreciated while the outbreak is being monitored and managed by local, State and Federal veterinary officials.

### Press Release 2: Advice to Poultry Workers and Owners To Limit Exposure to Avian Influenza

#### Precautions

To reduce the risk of infection, people living in areas where outbreaks of H5N1 among poultry or human H5N1 cases have been reported should observe the following measures to help avoid illness:

- Except for your own flock, avoid all contact with poultry (e.g., chickens, ducks, geese, pigeons, turkeys, and quail) or any wild birds. Do not visit settings where H5N1-infected poultry may be present, such as other commercial or backyard poultry farms, live poultry markets or auctions.
- Limit the exposure of your own family to your poultry flock. Only one caretaker should visit the poultry houses and that person should wear protective equipment including a mask, gloves, coveralls and boots. This protective equipment should be left in a clean room attached to the poultry house or inside a storage container, and not brought back into your home without prior disinfection.
- As with other infectious illnesses, one of the most important preventive practices is careful and frequent hand washing. Clean your hands often, using either soap and water (or waterless, alcohol-based hand gels when soap is not available and hands are

not visibly soiled) to remove potentially infectious materials from your skin and help prevent disease transmission.

- CDC does not recommend the routine use of masks or other personal protective equipment while in public areas.

**If you believe you might have been exposed to avian influenza, take the following precautions:**

- Monitor your health for 10 days.
- If you become ill with fever and develop a cough, sore throat, or difficulty breathing or if you develop any illness with fever during this 10-day period, consult a health-care provider. **Before you visit a health-care setting, call the provider and provide the following information: 1) your symptoms, 2) when and where you may have been exposed, and 3) if you have had direct contact with poultry.**

For more information about avian influenza, see <http://www.cdc.gov/flu/avian/index.htm>.

### **Press Release 3: Advice On Food Handling**

**Since 1986 there has been a program in place to monitor commercial poultry flocks in the United States for avian influenza, this surveillance has increased substantially due to the threat of Asian H5N1 avian influenza. Any poultry, raised by companies in the United States, known to be infected with avian influenza virus does not go into commerce and therefore not be available to consumers. You can not be infected by eating infected meat, because cooking to 158°F will kill the virus.**

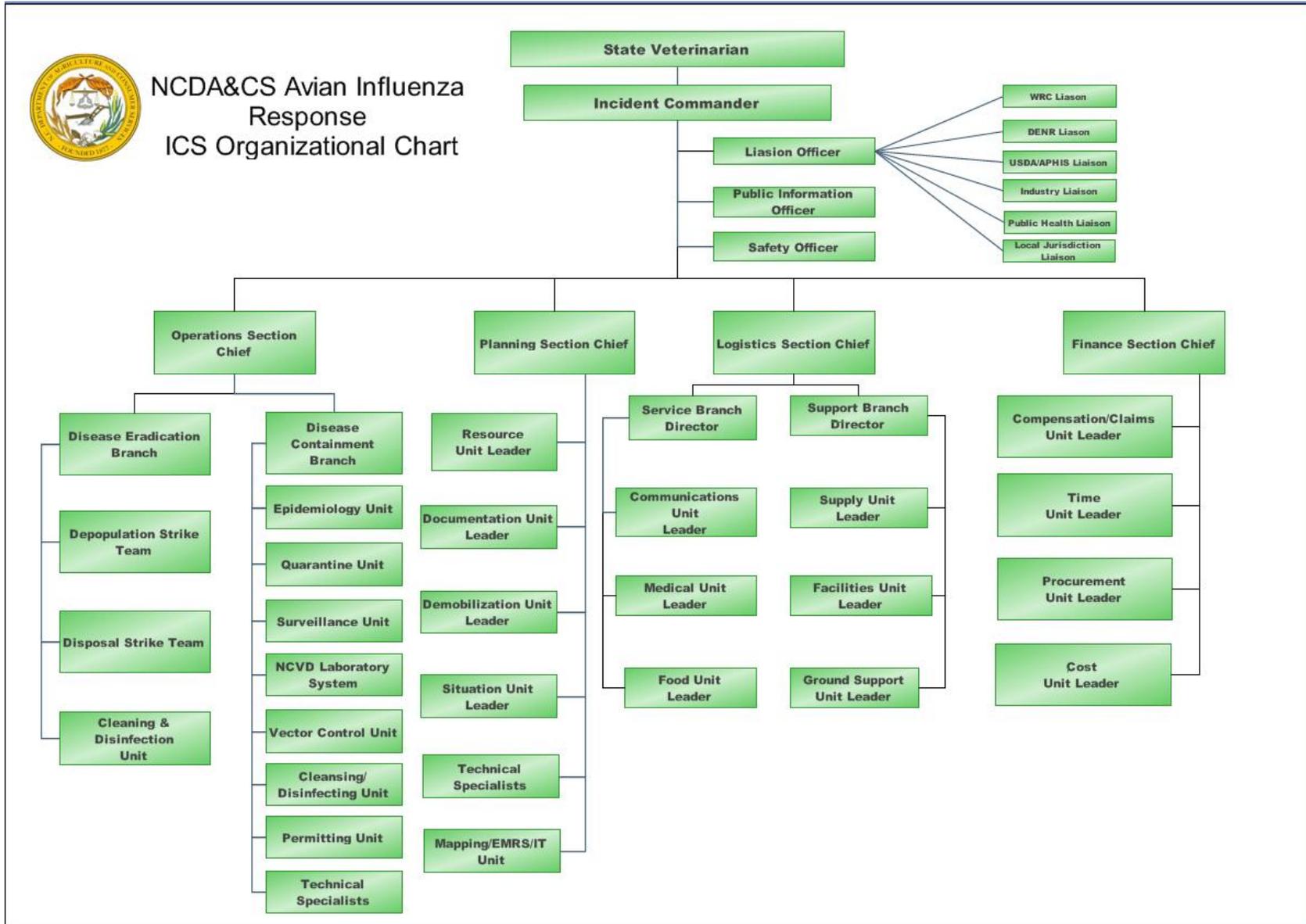
***Precautions When Preparing Food (these precautions apply to normal food safety hygiene)***

- Separate raw meat from cooked or ready-to-eat foods. Do not use the same chopping board or the same knife for preparing raw meat and cooked or ready-to-eat foods.
- Do not handle either raw or cooked foods without washing your hands in between.
- Do not place cooked meat back on the same plate or surface it was on before it was cooked.
- All foods from poultry, including eggs and poultry blood, should be cooked thoroughly. Egg yolks should not be runny or liquid. Because influenza viruses are destroyed by heat, the cooking temperature for poultry meat should reach 70°C (158°F).
- Wash egg shells in soapy water before handling and cooking, and wash your hands afterwards.
- Do not use raw or soft-boiled eggs in foods that will not be cooked.
- After handling raw poultry or eggs, wash your hands and all surfaces and utensils thoroughly with soap and water.

For more information about avian influenza, see <http://www.cdc.gov/flu/avian/index.html>

# Appendix V

## Incident Command Structure





# Appendix W

## Incident Command Structure-Roles and Definitions

From Emergency Management Institute ICS-100 training at  
<http://emilms.fema.gov/IS100A/ICS0103summary.htm>

### ICS Organization

The ICS organization is unique but easy to understand. There is no correlation between the ICS organization and the administrative structure of any single agency or jurisdiction. This is deliberate, because confusion over different position titles and organizational structures has been a significant stumbling block to effective incident management in the past.

For example, someone who serves as a Chief every day may not hold that title when deployed under an ICS structure.

### Performance of Management Functions

Every incident or event requires that certain management functions be performed. The problem must be identified and assessed, a plan to deal with it developed and implemented, and the necessary resources procured and paid for.

Regardless of the size of the incident, these management functions still will apply.

### Five Major Management Functions

There are five major management functions that are the foundation upon which the ICS organization develops. These functions apply whether you are handling a routine emergency, organizing for a major non-emergency event, or managing a response to a major disaster. The five major management functions are:



- **Incident Command:** Sets the incident objectives, strategies, and priorities and has overall responsibility for the incident.
- **Operations:** Conducts operations to reach the incident objectives. Establishes the tactics and directs all operational resources.
- **Planning:** Supports the incident action planning process by tracking resources, collecting/analyzing information, and maintaining documentation.
- **Logistics:** Provides resources and needed services to support the achievement of the incident objectives.
- **Finance/Administration:** Monitors costs related to the incident. Provides accounting, procurement, time recording, and cost analyses.

## Organizational Structure—Incident Commander

The Incident Commander has overall responsibility for managing the incident by objectives, planning strategies, and implementing tactics. **The Incident Commander is the only position that is always staffed in ICS applications.** On small incidents and events, one person, the Incident Commander, may accomplish all management functions.

The Incident Commander is responsible for all ICS management functions until he or she delegates the function.

## Organizational Structure—ICS Sections

Each of the primary ICS Sections may be subdivided as needed. The ICS organization has the capability to expand or contract to meet the needs of the incident.

A basic ICS operating guideline is that the person at the top of the organization is responsible until the authority is delegated to another person. Thus, on smaller incidents when these additional persons are not required, the Incident Commander will personally accomplish or manage all aspects of the incident organization.

## ICS Position Titles

To maintain span of control, the ICS organization can be divided into many levels of supervision. At each level, individuals with primary responsibility positions have distinct titles. Using specific ICS position titles serves three important purposes:

- Titles provide a common standard for all users. For example, if one agency uses the title Branch Chief, another Branch Manager, etc., this lack of consistency can cause confusion at the incident.
- The use of distinct titles for ICS positions allows for filling ICS positions with the most qualified individuals rather than by seniority.
- Standardized position titles are useful when requesting qualified personnel. For example, in deploying personnel, it is important to know if the positions needed are Unit Leaders, clerks, etc.

## Supervisory Position Titles

Organizational Level	Title	Support Position
Incident Command	Incident Commander	Deputy
Command Staff	Officer	Assistant
General Staff (Section)	Chief	Deputy
Branch	Director	Deputy
Division/Group	Supervisor	N/A
Unit	Leader	Manager
Strike Team/Task Force	Leader	Single Resource Boss

## Incident Commander's Overall Role

The Incident Commander has overall responsibility for managing the incident by objectives, planning strategies, and implementing tactics. The Incident Commander must be fully briefed and should have a written delegation of authority. Initially, assigning tactical resources and overseeing operations will be under the direct supervision of the Incident Commander.

Personnel assigned by the Incident Commander have the authority of their assigned positions, regardless of the rank they hold within their respective agencies.

## Incident Commander Responsibilities

In addition to having overall responsibility for managing the entire incident, the Incident Commander is specifically responsible for:

- Ensuring incident safety.
- Providing information services to internal and external stakeholders.
- Establishing and maintaining liaison with other agencies participating in the incident.

The Incident Commander may appoint one or more Deputies, if applicable, from the same agency or from other agencies or jurisdictions. Deputy Incident Commanders must be as qualified as the Incident Commander.

## Selecting and Changing Incident Commanders

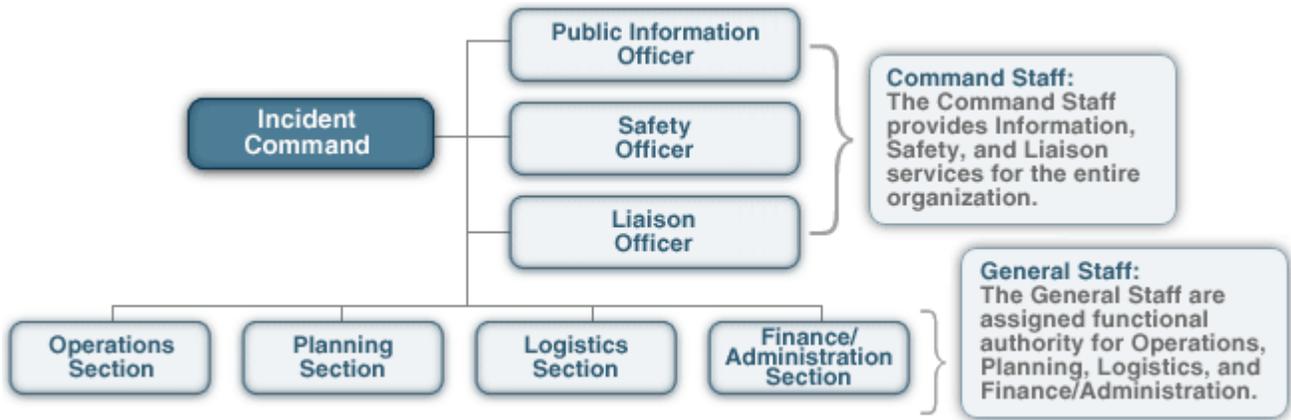
As incidents expand or contract, change in jurisdiction or discipline, or become more or less complex, command may change to meet the needs of the incident.

Rank, grade, and seniority are not the factors used to select the Incident Commander. The Incident Commander is always a highly qualified individual trained to lead the incident response.

As you learned in Lesson 2, formal transfer of command at an incident always requires a transfer of command briefing for the incoming Incident Commander and notification to all personnel that a change in command is taking place.

## Expanding the Organization

As incidents grow, the Incident Commander may delegate authority for performance of certain activities to the Command Staff and the General Staff. The Incident Commander will add positions only as needed.



## Command Staff

Depending upon the size and type of incident or event, it may be necessary for the Incident Commander to designate personnel to provide information, safety, and liaison services for the entire organization. In ICS, these personnel make up the Command Staff and consist of the:

- **Public Information Officer**, who serves as the conduit for information to internal and external stakeholders, including the media or other organizations seeking information directly from the incident or event.
- **Safety Officer**, who monitors safety conditions and develops measures for assuring the safety of all assigned personnel.
- **Liaison Officer**, who serves as the primary contact for supporting agencies assisting at an incident.

The Command Staff reports directly to the Incident Commander.

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**Appendix X**  
**NC Poultry Processing Plants**

# Appendix Y Indemnity Compliance Agreement Template

Compliance Agreement  
Between USDA, APHIS, VS and \_\_\_\_\_  
Indemnity Payment

**A. USDA, APHIS, Veterinary Services agrees to:**

1. Review, approve and submit for payment indemnity claims arising from H5/H7 LPAI eradication and control activities including reasonable costs associated with cleaning and disinfection of premises after removal of birds. Approval will be granted on the agreed associated costs and expenses as documented by the following: 1. Itemized invoices, 2. Indemnity forms (VS Form 1-23) and 3. Other requested and justifiable documentation of expenses.

**B. \_\_\_\_\_ Responsibilities:**

1. To have fully complied with the USDA Approved \_\_\_\_\_ H5/H7 LPAI Initial State Response and Containment Plan for removal of affected poultry and materials according to standards for cleaning and disinfection ( C&D) of affected premises as provided and approved by USDA, APHIS, VS, \_(OSA)\_\_\_\_\_, \_(cooperating state agency)\_, and \_\_\_\_\_ emergency diseases of poultry committee. See attachments Annex \_\_\_\_\_.
2. To have followed recommended procedures for disposal and follow up surveillance as provided for by the USDA Approved \_\_\_\_\_ H5/H7 LPAI Initial State Response and Containment Plan and approved by the USDA, \_(OSA)\_, \_cooperating state agency\_, and the \_\_\_\_\_ emergency diseases of poultry committee. See attachment Annex \_\_\_\_\_.
3. To insure that the premises are not repopulated until authorized by the \_\_\_\_\_, \_\_\_\_\_, and USDA and the quarantine is lifted, allowing the premises to come back into the production as soon as feasible. This will include approval of C&D, virus negative sampling post C&D, approval according to the USDA approved \_\_\_\_\_ H5/H7 LPAI Initial State Response and Containment Plan. See attachment annex \_\_\_\_\_.

Producer/Grower:\_\_\_\_\_.

Owner Name:\_\_\_\_\_.

Signature Producer/Grower Representative: \_\_\_\_\_ Date:\_\_\_\_\_.

Signature Owner Representative: \_\_\_\_\_ Date:\_\_\_\_\_.

Signature \_\_\_\_\_ State Veterinarian \_\_\_\_\_ Date:\_\_\_\_\_.

Signature USDA, APHIS, VS, AVIC \_\_\_\_\_ Date:\_\_\_\_\_.

# **Appendix Z**

## **Flock Plan Template**

**Flock Plan**  
**National Poultry Improvement Plan**  
**H5/H7 LPAI Euthanasia, Controlled Marketing, Disposal, Cleaning and Disinfection Procedures for Commercial**  
**Premises in \_\_\_\_\_**

This is a written flock management agreement developed between USDA, APHIS, VS and \_\_\_(OSA)(Cooperating State Agency)\_\_\_, with input from \_\_ (Owner)\_\_\_\_\_ and \_\_Producer/Grower\_\_.

Euthanasia will be the primary responsibility of \_\_\_\_\_ who may be reimbursed for certain expenses prior to Euthanasia based on the fair market value of the poultry, as determined by an appraisal. Appraisals of poultry must be signed by the owners of the poultry prior to the destruction of the poultry, unless the owners, APHIS, and the Cooperating State Agency agree that the poultry may be destroyed immediately. If the Cooperating State Agency and APHIS allows Controlled marketing, then it will be the primary responsibility of \_\_\_\_\_. Poultry moved for controlled marketing will not be eligible for indemnity.

Disposal will be the primary responsibility of \_\_\_\_\_ who may be reimbursed for certain expenses prior to disposal. Any disposal of poultry infected or exposed to H5/H7 LPAI for which compensation is requested must be performed under a compliance agreement between the claimant, the Cooperating State Agency and APHIS.

Cleaning and Disinfection of premises, conveyances, and materials will be the primary responsibility of \_\_\_\_\_ who may be reimbursed for certain expenses based on receipts or other documentation maintained by the claimant verifying expenditures for cleaning and disinfection activities under a compliance agreement.

**Euthanasia and Disposal:**

**Euthanasia**

The affected premise will be depopulate in a timely manner. Workers will be fit tested and medically approved prior to entering the farm and will don appropriate PPE. Biosecurity will be maintained using a clean area and dirty area, to be established prior to the commencement of euthanasia and disposal. An aerial photo of the affected premise may be helpful in determining the location of certain equipment used in the process.

House(s) will be euthanized using \_\_\_\_\_. Personnel from \_\_\_\_\_ and \_\_\_\_\_ will supervise and conduct the enthanasia process.

**Disposal**

The euthanized birds that are located within the poultry houses will be \_\_\_\_\_ with the concurrence of USDA, Cooperating State Agency, Official State Agency, \_State Environmental Agency\_.

There will be heaters installed in order to heat the houses to 100 ° F for 72 hours. A rodent specialist will bait the perimeter of the farm, fog for flies and apply insecticide. The house will be closed and left undisturbed for 21 days.

Associated materials from the house(s) will be removed, disinfected and placed outside the house(s). Feed left in the house(s) will be added to the litter. Do not clean out the house or move or spread litter until any H5/H7 LPAI virus that may have contaminated the manure and litter is dead, as determined by the Cooperating State Agency and in accordance with the ISR&C plan.

The litter will then be \_\_\_\_\_

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Sampling of litter for virus will be done before quarantine is released.

**Cleaning and Disinfection**

Cleaning and washing should be thorough to ensure that all materials and substances contaminated with H5/H7 LPAI virus, such as manure, dried blood and other organic materials, are removed from all surfaces.

Spray all contaminated surfaces above the floor with soap and water to knock dust down to the floor, using no more water than necessary. Wash equipment and houses with soap and water. Disassemble equipment as required to clean all contaminated surfaces. Special attention should be given to automatic feeders and other closed areas to ensure adequate cleaning. Inspect houses and equipment to ensure that cleaning has removed all contaminated materials or substances and let houses and equipment dry completely before applying disinfectant.

*Disinfection of premises and materials* . When cleaning has been completed and all surfaces are dry, all interior surfaces of the structure should be saturated with a disinfectant authorized in §71.10(a) of this chapter. A power spray unit should be used to spray the disinfectant on all surfaces, making sure that the disinfectant gets into cracks and crevices. Special attention should be given to automatic feeders and other closed areas to ensure adequate disinfection.

*Cleaning and disinfection of conveyances* . Clean and disinfect all trucks and vehicles used in transporting affected poultry or materials before soil dries in place. Both exterior, including the undercarriage, and interior surfaces, including truck cabs, must be cleaned. The interior of the truck cabs should be washed with clean water and sponged with a disinfectant authorized in §71.10(a) of this chapter. Manure and litter removed from these vehicles should be handled in a manner similar to that described in paragraph (d)(2)(i) of this section.

*Activities after cleaning and disinfection*. Premises should be checked for virus before repopulation in accordance with the initial State response and containment plan. The premises may not be restocked with poultry until after the date specified in the initial State response and containment plan \_\_\_\_\_.

*Destruction and disposal of materials*. In the case of materials for which the cost of cleaning and disinfection would exceed the value of the materials or for which cleaning and disinfection would be impracticable for any reason, the destruction and disposal of the materials must be conducted in accordance with the initial State response and containment plan.

**Surveillance of control/monitoring zones, contact surveys, and movement restrictions:**

As provided for in the \_\_\_\_\_ initial State Response and Containment Plan, on-farm surveillance will consist of \_\_\_\_\_ in the infected and buffer zone and will be repeated within \_\_\_\_\_ days for a second time.