

# **Highly Pathogenic Avian Influenza Secure Turkey Supply Plan**

**A Strategic Plan for Movement of Non-Infected Turkeys,  
Turkey Eggs, and Turkey Semen in a Highly Pathogenic  
Avian Influenza Control Area**

## Contents

<b>I. Secure Turkey Supply Plan .....</b>	<b>3</b>
<b>II. Biosecurity Recommendations for Commercial Turkey Premises.....</b>	<b>4</b>
<b>III. Epidemiology Information .....</b>	<b>4</b>
<b>IV. Pre-Movement Active Surveillance by Real-Time Reverse Transcriptase Polymerase Chain Reaction (RRT-PCR) Testing for Monitored Premises in a Control Area .....</b>	<b>5</b>
<b>V. Flock Mortality, Egg Production, and Visual Inspection Prior to Movement.....</b>	<b>8</b>
<b>Appendix A: Recommended Level 1 Biosecurity Measures Prior to an Outbreak of Highly Pathogenic Avian Influenza .....</b>	<b>9</b>
<b>Appendix B: Recommended Level 2 Biosecurity Measures Following an Outbreak of Highly Pathogenic Avian Influenza .....</b>	<b>12</b>
<b>Appendix C. Recommended Biosecurity Measures for Turkey Hatching Eggs and Day-Old Poults .....</b>	<b>16</b>
<b>Appendix D: Epidemiology Questionnaire for Turkeys Moving to Market.....</b>	<b>19</b>
<b>Appendix E: Turkey Marketing Schedule .....</b>	<b>26</b>
<b>Appendix F: Epidemiology Questionnaire for Turkeys, Turkey Eggs, and Turkey Semen Moving to Non-Market Locations .....</b>	<b>27</b>
<b>Appendix G: Designation of Zones, Areas, and Premises .....</b>	<b>34</b>
<b>Appendix H: Sampling Protocol for RRT-PCR Testing.....</b>	<b>36</b>
<b>Appendix I: Truck Cleaning and Disinfection Protocol and Report.....</b>	<b>37</b>
<b>Appendix J: Recommended Criteria for Issuing Movement Permits for Turkeys .....</b>	<b>38</b>
<b>Appendix K: Recommended Criteria for Issuing Movement Permits for Turkey Hatching Eggs.....</b>	<b>40</b>
<b>Appendix L: Example Initial Permit for Movement of Turkey Hatching Eggs.....</b>	<b>42</b>
<b>Appendix M: Example Subsequent Permit for Movement of Turkey Hatching Eggs .....</b>	<b>44</b>
<b>Appendix N: Public Health Risk Assessment for Movement of Infected But Undetected Turkeys Out of, Within, and Into a Control Area During an Outbreak of Highly Pathogenic Avian Influenza* .....</b>	<b>45</b>
<b>Appendix O. Cross-Commodity Pre-Movement Isolation Period (PMIP) .....</b>	<b>47</b>

## I. Secure Turkey Supply Plan

The Secure Turkey Supply (STS) Plan contains scientifically sound sampling protocols and proven, highly sensitive testing methods which will be employed in the event of an outbreak of highly pathogenic avian influenza (HPAI). Prior to issuing movement permits for turkeys and turkey eggs in a Control Area, stringent biosecurity measures must be in place on the premises of origin for a sufficient period of time to provide a high degree of confidence that HPAI has not been recently introduced so that the flock could be infected, but undetected. In addition, turkeys must be free of clinical signs associated with HPAI and house mortality must be within normal parameters before movement of live turkeys will be allowed. The STS Plan will help avoid restrictions on interstate or international trade, by providing a high degree of confidence to regulatory authorities in other states and other nations that no turkeys infected with HPAI virus will leave a Control Area. All poultry producers in a Control Area can be assured that turkeys moving under a permit issued by the Incident Command do not endanger the health of other uninfected flocks. Lastly, regulatory agencies with public health responsibilities, including the USDA Food Safety Inspection Service and the U. S. Food and Drug Administration, can have a high degree of confidence that HPAI virus is absent from turkey products intended for use in animal agriculture or for human consumption.

The STS Plan will be supported by risk assessments of potential poultry health impacts and risk assessments of possible public health impacts associated with movement of infected but undetected turkeys from a Control Area during an outbreak of HPAI. A risk assessment of the potential public health impact has been completed (Interagency Risk Assessment for the Public Health Impact of Highly Pathogenic Avian Influenza Virus in Poultry, Shell Eggs, and Egg Products – May 2010; **Appendix N**). This risk assessment was based on detection of HPAI in the index flock in an outbreak. Other risk assessments for the STS plan will be based on detection of HPAI in turkey flocks under increased surveillance in a Control Area (see the Secure Turkey Supply website: <http://www.secureturkeysupply.com/>).

The Secure Turkey Supply Plan Working Group — the multidisciplinary team assembled to prepare the Plan — includes representatives from:

- Iowa State University Center for Food Security and Public Health (CFSPH);
- University of Minnesota College of Veterinary Medicine;
- National Turkey Federation (NTF);
- Association of Veterinarians in Turkey Production (AVTP);
- Turkey industry; and
- USDA Animal and Plant Health Inspection Service Veterinary Services (USDA APHIS VS).

The STS Plan was created by a public-private-academic partnership and provides specific recommendations that emergency response decision makers (such as Incident Command personnel) can use in assessing animal health risks in order to rapidly decide whether to provide or deny permits for the movement of turkeys during an HPAI outbreak. This plan is subject to revision as advances in science occur; the characteristics of HPAI evolve; and as risk assessments are completed. The STS Plan supports a continuous supply of turkey products for the U.S. public; facilitates market continuity for the turkey sector and its customers; and fosters a high level of government, industry, trading partner, and consumer confidence in Foreign Animal Disease (FAD) preparedness and response efforts.

## II. Biosecurity Recommendations for Commercial Turkey Premises

Biosecurity must be in place on the premises of origin before movement permits will be issued for turkeys in a Control Area. A copy of the premises' biosecurity plan must be provided to the Incident Command. A high level of biosecurity (Level 2, see **Appendix B**) will be necessary before approval to move turkeys or turkey-related products can be given, but **BIOSECURITY ALONE DOES NOT GUARANTEE APPROVAL**. Before Incident Command approves such movement, the results of a) active and passive surveillance; b) geographic proximity to infected premises; and c) other pertinent factors, will be considered. The Incident Command will determine the time period for which specific biosecurity measures must be in place before turkey eggs or live turkeys are allowed to move.

Recommended (not required) biosecurity measures (Level 1, see **Appendix A**) for turkey producers to implement prior to an outbreak have been developed based upon extensive input and discussion from turkey industry veterinarians, state and federal epidemiologists, university poultry veterinarians, and federal regulatory agencies. Implementation of these biosecurity measures prior to an outbreak will significantly reduce the likelihood that the HPAI virus will be introduced onto a commercial turkey premises.

- Level 1 biosecurity measures are recommended (not required) for turkey farms prior to an outbreak of HPAI (**Appendix A**).
- Level 2 biosecurity measures are recommended following diagnosis of highly pathogenic H5 or H7 avian influenza in a region before turkeys can be permitted to move (**Appendix B**). The Incident Command will determine which specific biosecurity measures must be in place before turkey eggs or live turkeys are allowed to move.

## III. Epidemiology Information

1. A short epidemiology questionnaire is available for turkeys moving from a grow-out house to market (**Appendix D**). A longer epidemiology questionnaire is used for movement of all other turkeys and turkey eggs (**Appendix F**).
2. Epidemiology questionnaires should be completed whenever a new infected premises is identified.
3. In the event of an HPAI outbreak, the epidemiology questionnaire shown in **Appendix F** will be used by the Incident Management Team for: a) infected, suspect, and contact premises; b) non-infected breeder farms moving eggs to a hatchery; and c) non-infected brooder farms moving turkeys to a grow-out facility. If turkeys are to be moved interstate, the State Animal Health Official (SAHO) of the destination state may require information from the epidemiology questionnaire prior to granting permission for turkeys to enter their state.
4. For infected premises, the questionnaire will assist epidemiologists to: a) assess risk factors associated with employees, wild birds, and carcass disposal; b) determine how HPAI may have been carried onto a farm (trace back information); and c) determine where HPAI may have traveled from a farm (trace forward information).
5. For non-infected turkey premises and hatcheries, this information will assist epidemiologists should HPAI be diagnosed at a later date on one of these premises.

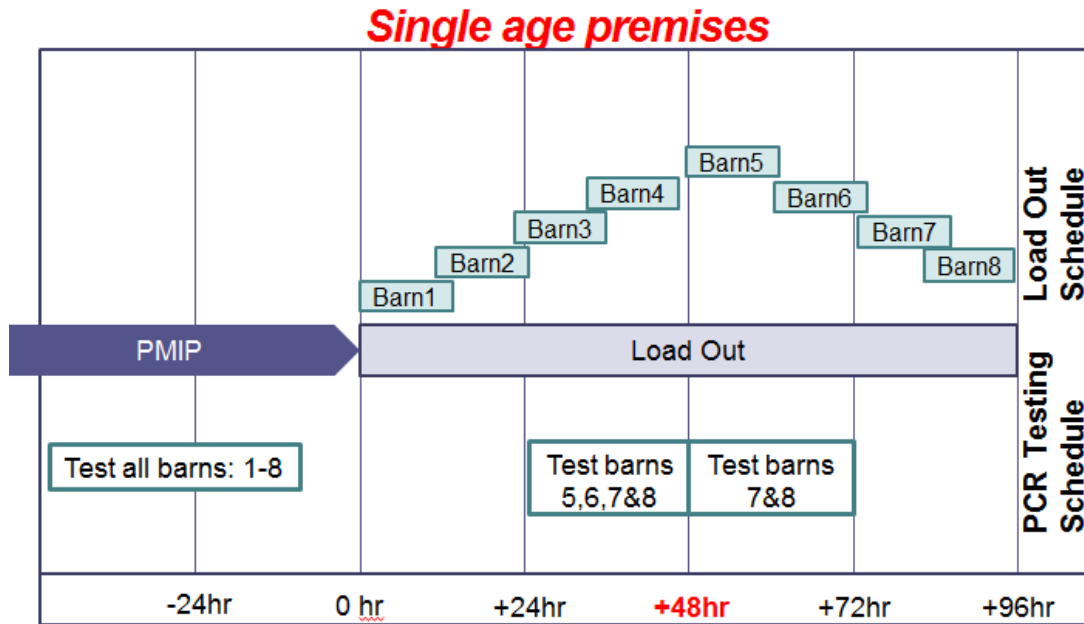
6. For all premises within an HPAI Control Area, epidemiology questionnaire information will be used to help classify premises as Contact Premises, Suspect Premises, At-Risk Premises, or Monitored Premises. The USDA APHIS designation of zones, areas, and premises is shown in **Appendix G**.

#### **IV. Pre-Movement Active Surveillance by Real-Time Reverse Transcriptase Polymerase Chain Reaction (RRT-PCR) Testing for Monitored Premises in a Control Area**

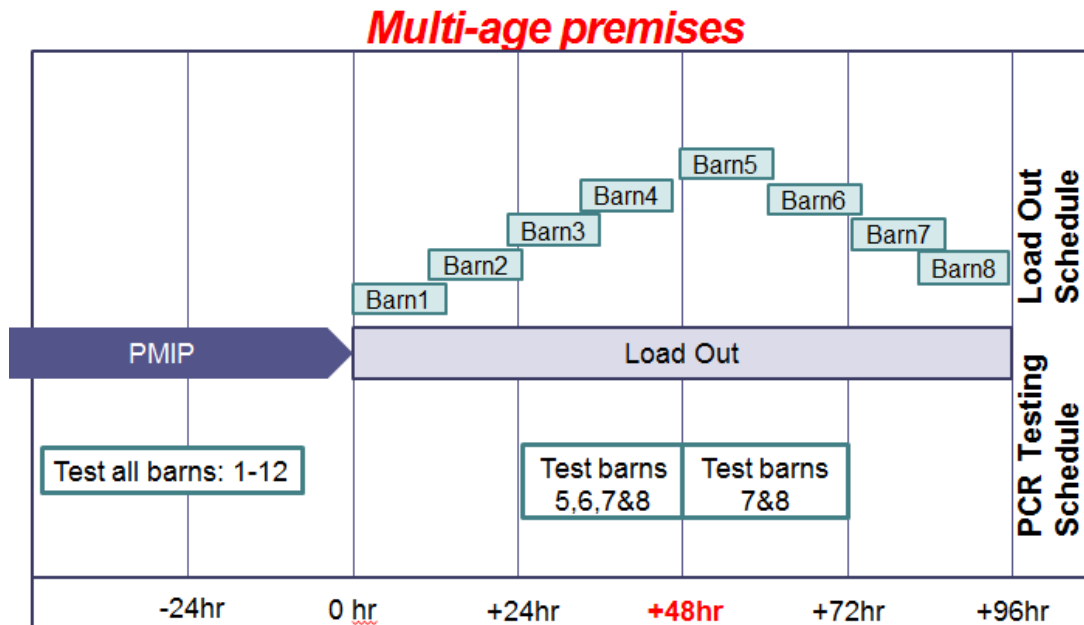
1. **Disease Detection Surveillance for Commercial Premises in a Control Area.** Early in the outbreak, the Incident Command may collect additional samples for surveillance and disease detection as described in the HPAI Response Plan (The [USDA Red Book](#)).
2. **Pre-Movement Sampling and Testing Protocol for Monitored Breeder and Commercial Premises.**
  - a. **Number of turkeys sampled.** At least one 5-bird pooled sample must be tested by RRT-PCR (Influenza matrix gene real-time reverse transcriptase polymerase chain reaction) for each 50 dead turkeys and found to be negative from every house on the premises for two consecutive days prior to movement of live turkeys, turkey eggs, or turkey semen. The time interval between collection of samples on consecutive days must be at least 18 hours. If there are less than 5 dead turkeys in the house, the remainder of the samples should be taken from sick turkeys. Two 5-bird pooled samples that test negative provide a 95% level of confidence that HPAI will be detected if at least 40% of sampled turkeys are shedding HPAI virus. For products that move daily, at least one 5-bird pool from each house on the premises must test negative by the RRT-PCR test on each day prior to movement of turkeys, eggs, or semen.
  - b. A **5-bird pooled sample** consists of combined samples taken from five dead or sick turkeys from each house on a premises.
  - c. A **house** consists of turkeys of the same age in one building which are marketed on the same day.
  - d. **Time to sample dead or sick turkeys.** Samples must be taken within 24 hours prior to the start of load-out of live turkeys (or turkey products) from the premises. Load-out begins as the first crew, vehicle, or equipment arrives on the premises and ends when the last load of birds departs the premises. Pre-staging of equipment during the pre-movement isolation period (PMIP) is prohibited (see **Appendix O**). For load-outs that require multiple days, daily testing is required from all barns that will not be loaded out within 48 hours of the start of premises-level load-out. For multi-age premises, this daily testing does not include houses with younger birds that will not be loaded out (see Figures 1 and 2). For example, if turkeys from one farm will be marketed on four consecutive days, then (in addition to the samples taken immediately before the start of load-out) samples will be collected each day from all barns that will be loaded out. Targeting dead and sick birds reduces the sample size required to attain a 95% confidence level because the prevalence of HPAI infected birds should be higher in this group than in the house as a whole. If an unusual HPAI virus proves to be slow-moving, further adjustments to the sampling protocol may be made.

- e. **Turkeys selected for sampling.** Oropharyngeal swabs should be taken only from dead or sick turkeys and dead turkeys should be sampled before sick turkeys. Sick birds selected for sampling should exhibit clinical signs compatible with HPAI (depression or respiratory signs). If the number of dead and sick turkeys in a house is less than 5, then swabs from available sick or dead birds should be collected.
- f. **Authorized sample collectors.** An individual authorized by the Incident Command will sample each turkey by swabbing the oropharynx.
- g. **Specimen delivery to a designated sampling location.** Specimens to be tested must be brought to a location near the premises designated by the IC. Three types of specimens may be brought to this location: 1) dead turkeys from each house; 2) heads and necks from dead turkeys in each house; or 3) Brain-Heart Infusion (BHI) tubes in which oropharyngeal swabs from 5 turkeys in each house have been swirled. Specimens must be placed in a leak-proof container (such as a heavy-duty plastic garbage bag) each morning. Each container and BHI tube shall be labeled with the farm of origin, house of origin, number of birds found dead in the house that day, and the premises identification. It is recommended that heads and necks and BHI tubes be placed in insulated containers with ice packs.
- h. **Sampling procedure.** One sterile polyester or rayon swab with a plastic handle is used to swab the palatine (choanal) cleft on the roof of the mouth, entire oral cavity, and surface of the tracheal opening of one turkey, picking up as much mucus as possible. Thereafter, the swab is immersed in BHI broth (2.0-3.0 ml for a 5-bird pool), vigorously swirled in the broth, and as much fluid as possible is squeezed out of the swab by pressing the swab against the inside of the tube before withdrawing the swab from the BHI tube. Swabs from 5 sampled turkeys should be swirled in one BHI tube. Flocked swabs are recommended, but woven swabs are acceptable. Cotton or calcium alginate swabs with wooden handles should not be used. Disposal of swabs after use should be done in accordance with an approved biosecurity protocol.
- i. **Disposal of turkeys after sampling.** After samples have been taken, farm personnel shall dispose of carcasses in accordance with an approved biosecurity protocol.
- j. **Laboratory submission.** BHI tubes containing oropharyngeal samples (5 oropharyngeal swabs/BHI tube) will be submitted as directed by the Incident Command to an authorized National Animal Health Laboratory Network (NAHLN) laboratory. These samples must be submitted on the day of sample collection by a State or Federal regulatory official or an IC-authorized person. The NAHLN laboratory and Incident Command will establish the time of day by which samples must be submitted to an authorized laboratory (for example, by 12:30 p.m.).
- k. **Laboratory testing and reporting.** NAHLN laboratory personnel performing RRT-PCR will test samples immediately upon receipt and electronically send test results to the Incident Command by the end of each day. The Incident Command will report test results to farm managers as soon as results are available. If RRT-PCR tests are not negative, additional diagnostic testing will be conducted.

1. **Negative RRT-PCR results required.** RRT-PCR tests from all samples collected from turkeys during the preceding 24 hours must be negative prior to movement of turkeys, eggs, or semen from the premises.



**Figure 1.** Daily testing is required of birds in all barns that are not loaded out within 48 hours of the start of premises-level load-out. In this example, there are eight barns on a single-age premises and complete depopulation of the premises takes 96 hours.



**Figure 2.** Daily testing is required of birds in all barns that are not loaded out within 48 hours of the start of premises-level load-out. In this example, barns 1-8 are market-age turkeys, and barns 9-12 are 12-week-old turkeys. Depopulation of the market-age birds takes 96 hours.

## **V. Flock Mortality, Egg Production, and Visual Inspection Prior to Movement**

1. Prior to moving turkeys to any other location, turkey producers will be required to electronically submit records of daily mortality for the preceding 7 days for each turkey house on the premises to the Incident Command.
2. If daily mortality is abnormally high (more than 2/1,000 birds in a flock) immediately prior to a scheduled movement of turkeys, eggs, or semen, these products shall not move until diagnostic steps have been initiated and HPAI has been ruled out as the cause of elevated mortality.
3. If egg production drops significantly (a total of 15% or more) during a two-day period prior to a scheduled movement, turkey hatching eggs shall not move until diagnostic steps have been initiated and HPAI has been ruled out as the cause of the drop in egg production.
4. Company veterinarians or independent producers will be required to report significant unexplained changes in feed consumption, water consumption, or behavior.
5. Visual inspection of turkeys in all houses on premises within 24 hours prior to movement will be required for all premises located in the Control Area (infected zone plus buffer zone) that wish to move turkeys. Visual inspection may be performed by a company-designated individual.
6. If 50 or more dead turkeys are present in a finishing house immediately prior to or during load-out, the Incident Command must be contacted before turkeys are removed from the house.



## Appendix A: Recommended Level 1 Biosecurity Measures Prior to an Outbreak of Highly Pathogenic Avian Influenza

### A. Biosecurity Policies, Outside Areas, and Parking

1. A <b>Biosecurity Manual</b> is available to the farm manager.
2. Turkey production companies provide <b>annual biosecurity training</b> for growers and farm employees. Biosecurity training stresses the importance of <b>avoiding contact with other birds</b> not owned by the business—including birds at live markets, pet birds, domestic chickens, fighting chickens, ducks, geese, waterfowl, exotic birds, quail, partridge, or pheasants. In the event that contact is made with any of the above, employees agree that they will comply with a 24-hour waiting period before returning to work. Records documenting biosecurity training are maintained in company offices.
3. Farm policy requires that employees should <b>not own</b> other birds—including pet birds, domestic chickens, fighting chickens, ducks, geese, waterfowl, exotic birds, quail, partridge, or pheasants.
4. <b>Signs warning people not to enter</b> the farm or any of its buildings because of disease control (No Admittance - Biosecurity Zone) are posted at the farm entrance and at entrances to turkey houses.
5. Only <b>cleaned and sanitized footwear</b> , disposable footwear, or footwear dedicated to a turkey house shall be worn.
6. <b>Vehicles should be parked away from turkey houses</b> , as much as possible, and in locations which avoid air from turkey houses.

### B. People

#### 1. Growers, Farm Employees, Service Technicians, Service Crews, and Veterinarians

7. <b>Disposable boots, masks, and hairnets</b> should be deposited in an appropriate disposal container prior to exiting the farm.
8. <b>Rubber boots should be washed and disinfected</b> prior to wearing on another farm. Dump wash water and clean bottom of bucket with brush.

#### 2. Truck Drivers, Trucks, and Trailers

9. Drivers are prohibited from entering turkey houses.
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**C. Turkeys and Turkey Houses**

10. Records of daily mortality are available for each house since placement in the turkey house.
11. <b>Houses are bird-proofed</b> against wild or free-flying birds.
12. <b>Dogs are not allowed</b> in turkey houses.
13. <b>Cats are not allowed</b> in turkey houses.

**D. Turkey Loadout, Livehaul, and Equipment**

14. Transport trucks and loadout equipment are cleaned and disinfected prior to entry onto the farm.
15. <b>Sharing equipment</b> between turkey farms is <b>not recommended</b> . In the event that equipment must be shared, effective cleaning and disinfecting must take place between uses.

**E. Other Birds and Pest Control**

16. <b>No domestic birds</b> are to be maintained on premises outside turkey houses.
17. Control measures to <b>discourage the presence of wild and migratory birds</b> on the premises are in place.

**F. Feed and water**

18. <b>Feed bins are secured</b> to prevent contamination by wild birds or rodents.
19. <b>Spilled feed is cleaned up promptly</b> to prevent attracting wild birds and rodents.
20. <b>Water sources are secure</b> and cannot be accessed by free-flying birds or rodents or water sources are disinfected.
21. Feed delivery routes should be selected in <b>consultation with a poultry veterinarian</b> to minimize contact and proximity with live poultry and poultry products.

**G. Manure Removal and Dead Bird Disposal**

22. Dead turkeys are collected and removed from the house each day.
23. Disposal of dead turkeys does not expose turkeys in other houses or other farms to potential pathogens. There is a dedicated on-site location for mortality that is as far away from the barns as possible.

24. Multiple poultry farms should not share initial collection sites for dead poultry.
25. Manure trucks should never go from one poultry farm to another on the same day. However, if required, the manure trucks must be washed with detergent and disinfected prior to arrival at the next farm.
26. Vehicles that have been to a rendering plant must be cleaned and disinfected before returning to the turkey farm.
27. Containers for dead turkeys (dumpsters) should never leave the farm.

## Appendix B: Recommended Level 2 Biosecurity Measures Following an Outbreak of Highly Pathogenic Avian Influenza

### A. Biosecurity Policies, Outside Areas, and Parking

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| 1. A written Level 2 biosecurity plan is available which will be implemented during an outbreak of highly pathogenic avian influenza.  |
| 2. <b>Entry and exit from an Infected Premises</b> will be controlled by the Incident Command or their duly authorized representative. |

### B. People

#### 1. Growers, Farm Employees, Service Technicians, Service Crews, Veterinarians

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|--|
| 3. <b>Cleaned and disinfected footwear</b> or site-provided footwear or footwear covers <b>must be worn</b> prior to entering turkey houses.   |
| 4. <b>Clean protective clothing and head covering dedicated to the farm</b> should be worn prior to entering turkey houses.  |
| 5. Farm policy <b>prohibits exposure to equipment</b> from other farms that has not been cleaned and disinfected. Equipment should be inspected prior to entry onto the farm.  |
| 6. Thoroughly <b>disinfect any equipment taken into poultry house</b> before putting it back into a vehicle.   |
| 7. <b>Disposable personal protective equipment (PPE, such as coveralls, disposable boots, masks, and hairnets)</b> should be deposited in an appropriate disposal container prior to exiting the farm. Non-disposable PPE (such as eye protection or respirators) should be placed in a plastic bag or container and cleaned and disinfected before re-use.                                  |
| 8. <b>Routine premises visits</b> by utility employees (such as meter readers) <b>are prohibited</b> and must be replaced by telephone communications. During the 8-day period prior to movement of turkeys, no farm visits should occur except for critical operations (e.g., feed delivery and necessary service visits to address changes in bird health) (see <b>Appendix O</b> – PMIP). |
| 9. <b>Hand hygiene is mandatory</b> after contact with poultry, contact with contaminated surfaces, or after removing gloves. Hands must be washed with soap and water for 20 seconds or hand disinfectants must be used.  |

## 2. Truck Drivers, Trucks, and Trailers

<p>10. <b>All vehicles must pass through a designated entry and exit checkpoint</b> located at the perimeter of the Infected Zone.</p>
<p>11. <b>No movement of trucks, other vehicles, or people</b> shall occur within the Infected Zone without a permit from the Incident Command. Initial movement permits will be issued by the Incident Command but subsequent electronic permits can be generated at the farm.</p>
<p>12. <b>The outside of all vehicles will be cleaned &amp; disinfected</b> as approved by regulatory personnel with an approved disinfectant at a cleaning and disinfection (C&amp;D) station at or near the turkey premises within the Infected Zone. If C&amp;D cannot be completed at the turkey premises the vehicles must be accompanied by a permit issued by the Incident Command to travel to a C&amp;D station within the Infected Zone. Trucks will be washed to remove mud and debris to the extent needed to allow effective operation of disinfectant sprayers. Vehicle must be approved by an authorized inspector before proceeding into or out of the Infected Zone.</p>
<p>13. <b>Drivers use a hand sanitizer</b> before leaving and after re-entering the cab.</p>
<p>14. <b>Vehicle windows should be rolled up</b> at all times while on the poultry farm in order to prevent flies from getting into the vehicle.</p>
<p>15. <b>Spray insecticide</b> inside trucks as needed to eliminate the transporting of flies from farm to farm during warm months of the year.</p>
<p>16. <b>Clean &amp; disinfect vehicles inside the cabs daily</b> with an approved aerosol disinfectant. Spray the floors, pedals, and bottoms of feet with disinfectant after every stop.</p>
<p>17. All <b>drivers and passengers must wear boots</b> (rubber or disposable) before getting out of the vehicle. Boots must be worn the whole time on the farm. <b>When exiting the farm, put disposable boots, masks, and hairnets</b> in an appropriate disposal container prior to exiting the farm. Then spray shoes with disinfectant before entering your vehicle. Rubber boots and any tools used on the farm must be cleaned and disinfected prior to being removed from the turkey premises.</p>
<p>18. <b>Feed delivery within the Infected Zone</b> will not include split loads. Only <b>dedicated vehicles</b> will be used for feed delivery within an infected zone. Left-over feed will remain on the farm or be taken to other farms within the Infected Zone. A permit from the Incident Command's office is required to move feed off of a farm located in the Infected Zone.</p>
<p>19. <b>Poult</b> restocking of premises and movement of turkeys from brooder farms to grow-out farms within the Infected Zone will not occur for a minimum of 21 days following official approval of cleaning and disinfection procedures or as otherwise approved by the Incident Command. Placements in the Control Area will be evaluated on an individual basis. Deliveries to farms will be in</p>

disposable containers only. Drivers must stay in the truck on all deliveries. Poultry delivery trucks must be cleaned and disinfected after delivery into a Control Area.

### 3. Visitors, Contract Laborers, and Surveillance Crews

20. **No visitors** should be allowed on the farm or enter turkey houses **unless** absolutely necessary.

21. Visitors, laborers, and surveillance crews who have had **contact with birds** during the preceding 72 hours are **prohibited from entering** turkey houses. Surveillance crews should collect samples from dead or sick turkeys in a manner that meets the sampling criteria and that is acceptable to the Incident Command. See measure 24 below.

22. **Visitors and laborers must wear clean coveralls**, hair nets, and clean footwear and must use disinfection stations provided at the door before entering a turkey house. **Disposable personal protective equipment (PPE, such as coveralls or footwear) should be properly discarded**, and non-disposable PPE (such as eye protection or respirators) must be cleaned and disinfected before removal from the turkey premises.

### C. Turkeys and Turkey Houses

23. **If mortality rates in a turkey house** exceeds 2/1,000 turkeys in a house, the Incident Command must be notified immediately. An appropriate regulatory official will provide assistance in collecting and delivering appropriate samples to a veterinary diagnostic laboratory.

24. Dead turkeys must be placed in closed containers and left in a location approved by the Incident Command.

### D. Turkey Load-out, Livehaul, and Equipment

25. Turkey loading **crews are prohibited from entering other turkey houses** on the same farm.

26. **Before entering the premises**, load-out and live haul equipment have been **cleaned and disinfected** under the appropriate protocol.

27. After a turkey house is depopulated, **turkey-loading equipment is cleaned and disinfected** as shown in the NAHEMS guidelines.<sup>1</sup>

28. **Loadouts and livehaul** within the Control Area will be limited to one farm per

<sup>1</sup> NAHEMS Guidelines: Cleaning and Disinfection:

[https://www.aphis.usda.gov/animal\\_health/emergency\\_management/downloads/nahems\\_guidelines/cleaning\\_disinfection.pdf](https://www.aphis.usda.gov/animal_health/emergency_management/downloads/nahems_guidelines/cleaning_disinfection.pdf)

<p>night per crew and must be supported by a movement permit issued by the Incident Command. Schedules will be forced through the processing plant as necessary. Crews must shower and change to clean clothes and footwear between farms. Equipment, clothing, and footwear must be cleaned and disinfected following load-out.</p>
<p>29. <b>Livehaul trucks and equipment</b> must be cleaned and disinfected at the processing plant before going to turkey farms as shown in the NAHEMS guidelines.<sup>2</sup></p>
<p>30. <b>Livehaul trucks must follow a route approved by the Incident Command team.</b></p>
<p>31. Turkeys from farms in an Infected Zone should be <b>loaded on a day at the end of a week</b> to maximize opportunity for C&amp;D and downtime.</p>

## E. Manure Removal and Dead Bird Disposal

<p>32. <b>Dead birds</b> from all houses should be disposed of or held on-site in a biosecure manner.</p>
<p>33. <b>Composting</b> must be managed properly to ensure <b>carcasses are covered</b> to prevent exposure to wild animals and to maintain adequate temperatures for composting.</p>
<p>34. When <b>on-farm incineration</b> is used, carcasses must be protected from exposure to wild animals.</p>
<p>35. <b>No movement of poultry litter or dead turkeys off a farm</b> is allowed for premises in an Infected Zone without a permit issued by the Incident Command.</p>
<p>36. <b>Trucks moving manure or dead birds should be covered</b> to prevent the dissemination of potentially contaminated feathers and follow a designated approved route.</p>
<p>37. <b>Trucks moving manure or dead birds must be cleaned and disinfected</b> using the appropriate protocol after delivery.</p>

<sup>2</sup> NAHEMS Guidelines: Cleaning and Disinfection:  
[https://www.aphis.usda.gov/animal\\_health/emergency\\_management/downloads/nahems\\_guidelines/cleaning\\_disinfection.pdf](https://www.aphis.usda.gov/animal_health/emergency_management/downloads/nahems_guidelines/cleaning_disinfection.pdf)

## Appendix C. Recommended Biosecurity Measures for Turkey Hatching Eggs and Day-Old Poults

### A. Turkey Hatching Eggs

#### 1. Farm operations

1. Farm-specific materials must be used for gathering eggs
2. Hatching eggs must be packed in either new disposable materials or plastic materials that were previously cleaned and disinfected at the hatchery.*
3. Hatching eggs must be washed and sanitized with a chlorine rinse with at least a 200 ppm concentration or with an EPA registered disinfectant for avian influenza virus according to the manufacturer's label directions for application on hatching eggs.
4. If flats are taken into a hen house, eggs must be washed and sanitized while on the flats or transferred to clean flats after being washed or sanitized. Employees who manually transfer eggs must wash their hands with soap and water or use a hand sanitizer immediately before doing so.
5. Farm personnel should disinfect the egg storage room floor and buggy wheels before buggies are moved for loading; <u>or</u> egg buggies must be washed and sanitized immediately prior to moving into an egg storage room cooler, being careful to cover the entire circumference of the buggy wheels.
6. Farm personnel should don disposable gloves and disposable boots or boots which have been cleaned and disinfected immediately before entering egg storage coolers.

\*Disinfectants for hard and nonporous surfaces may be selected from EPA registered products or from other products shown to be efficacious against avian influenza viruses. These products include acetic acid (5%), citric acid (1% and 3%), calcium hypochlorite (750 ppm), sodium hypochlorite (750 ppm), laundry detergent with peroxygen (bleach), and commercially available iodine/acid disinfectant. (Avian Diseases 52:118-123, 2008)

#### 2. Transport of hatching eggs

7. Turkey hatching eggs must be moved from the turkey breeding farm directly and only to a hatchery.
8. The transport vehicle shall be sealed by farm or company personnel under the authorization of the Incident Command.
9. Egg pick-up drivers shall not enter poult processing areas, conduct poult deliveries, or handle poults on the same day that they have delivered eggs to the hatchery.
10. The State Animal Health Official of the State of destination must receive a copy of the restricted movement permit within 24 hours of issuance



### 3. Hatchery operations

11. Egg deliveries to the hatchery and transfer of hatching eggs into setters must be conducted after hatching and poult processing operations on the same day have been completed <u>or</u> have separate personnel performing these functions.
12. If the hatchery has a loading dock that is used for hatching eggs and poults, poults must leave the loading dock before eggs are received <u>or</u> hatchery loading docks, connecting passages, and receiving storage areas must be cleaned and disinfected with an EPA registered disinfectant after receiving each truckload of hatching eggs.
13. Egg contents leaked onto hatchery floors must be cleaned and disinfected according to hatchery standard operating procedures (SOPs) as soon as possible.
14. Employees must wash their hands with soap or apply a hand sanitizer before entering the hatcher room or poult processing rooms as well as prior to leaving the hatchery. Employees must take precautions to prevent the transfer of microbial contamination into the poult processing room via shoes by utilizing a foot bath or clean disposable shoe covers.
15. Egg-handling materials shall be returned to the premises of origin after at least 24 hours have elapsed since these materials were moved from the farm and without contacting materials going to other premises.

## B. Day-Old Poults

### 1. Farm operations – Poult-handling materials:

16. <b>Measures for handling dollies:</b> If dollies are unloaded from the vehicle during poult placement, their wheels should be sprayed with a disinfectant before being brought into the hatchery.
17. Disposable (cardboard) poult-handling materials are used in place of reusable boxes such that only the truck and dollies return to the hatchery. If padding material is used in boxes, it should be disposed of at the farm after poults are placed. If reusable poult-handling materials are used, they should be C&D upon return to the hatchery, where they are unloaded at a specially designated dock.
18. For essential visitors: cleaned and disinfected footwear or site-provided footwear or footwear covers must be worn prior to entering the hatchery. Clean protective clothing and head covering dedicated to the hatchery should be worn prior to entering. Hands must be washed or sanitized before entering and prior to leaving the hatchery.
19. Essential visitors who have had contact with other birds during the preceding 24 hours are prohibited from entering the poult-processing area.
20. Visitors collecting hatchery waste should not enter the hatchery building. Hatchery personnel should keep waste bins outside for collection to facilitate this protocol. Waste bins should be stored in a way to prevent access to wild birds or wildlife.

## 2. Transportation of day-old poults

21. Poults shall be moved in clean reusable or new paper boxes with clean reusable or new pads.

22. The State Animal Health Official of the State of destination must be faxed a copy of the restricted movement permit within 24 hours of issuance.

## 3. Measures for placement of poults at brooder premises

23. One of the three options for the observation period and C&D protocols prior to placement of poults in a brooder premises in a HPAI Control Area listed below should be followed. Observation period refers to the time focused on observing the birds that have been moved out from the brooder premises before placing a new batch of birds into the brooder house (the term downtime is used by the industry and refers to the premises and the intentional time the house is left empty between flocks prior to introducing new birds into the house). The observation period is defined to begin when the previous flock leaves the house and end when the new batch of day-old poults is placed.

1. 10-day observation period with litter removal followed by C&D.

2. 7-day observation period with litter removal followed by C&D in conjunction with RRT-PCR testing of the birds previously moved from the brooder house on observation time days 6 and 7. The sampling protocols described in section IV of this plan should be followed for the RRT-PCR testing.

3. 10-day observation period with RRT-PCR testing of the birds moved from the brooder house on observation time days 9 and 10. The sampling protocols described in section IV of this plan should be followed for the RRT-PCR testing.

24. Birds on a multiple-age brooder premises in a Control Area should be tested as described in the surveillance guidelines before testing day-old poults.

## Appendix D: Epidemiology Questionnaire for Turkeys Moving to Market

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Farm mailing address (911): \_\_\_\_\_

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

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

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

GPS coordinates (decimal degrees) at farm gate: \_\_\_\_\_

\* Person who controls marketing decisions for this premises, i.e. when and where the house will be marketed.

**Farm Information**

State Premises Identification Number: \_\_\_\_\_

Turkeys on premises:

Number: \_\_\_\_\_

Type: \_\_\_\_\_

Ages: \_\_\_\_\_

Number of turkey houses on premises: \_\_\_\_\_

Name of Destination Slaughter Plant: \_\_\_\_\_

Address of Destination Slaughter Plant: \_\_\_\_\_

\_\_\_\_\_

Planned route to Destination Slaughter Plant: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Load-out Crew Identification: \_\_\_\_\_

**Flock Health Information.**

1. Has the mortality rate remained at 2/1,000 turkeys or less in the house during the preceding 14 days?  
 Yes  No

a. If the answer is NO, a copy of pertinent mortality records for the preceding 14 days must be submitted to the Incident Command.

b. Diagnostic tests conducted: \_\_\_\_\_

\_\_\_\_\_

c. Test results: \_\_\_\_\_

\_\_\_\_\_

2. Have you noticed unusual listlessness or depression in the house during the preceding 2 days?

Yes  No

3. Avian influenza test results (preceding 30 days)

Date	Sample Type	No. Samples Tested	Laboratory Used	Results

**Foreign Animal Disease investigators may find it helpful to sketch the location of buildings in relation to the road access on the bottom of this page.**

### Employee Risk Factors

4. Do any of your **employees work at other poultry premises** or have they visited other poultry premises, hatcheries, processing plants, or poultry slaughtering facilities within the past 14 days?  Yes  No
5. Do any of your employees **live or associate with someone who works at another poultry farm**, hatchery, processing plant, slaughter facility or rendering plant?  Yes  No
6. Have you hired **new personnel** during the past 14 days?  Yes  No
- a) If YES, did they work for another poultry premises before you hired them?  Yes  No
- b) If YES, where did they work prior to coming to your premises? \_\_\_\_\_
7. Has an employee from this premises visited a **rendering plant** within the past 14 days?  Yes  No
- If YES, what plant? \_\_\_\_\_

### Biosecurity Risk Factors

8. Have **migratory waterfowl** been seen on the ground or water within 0.62 miles (1 km) of your buildings containing turkeys in the last 14 days?  Yes  No
- If YES, please describe: \_\_\_\_\_
9. Have **free flying birds** been observed in the turkey houses in the past 14 days?  Yes  No
10. Is **feed** protected from exposure to feces from wild birds, waterfowl, rodents and/or wild mammals?  Yes  No
11. Is **water** protected from exposure to feces from wild birds, waterfowl, rodents and/or wild mammals?  Yes  No
12. Which of the following describes this farm's usual **carcass (daily mortality) disposal** method? (Mark ALL that apply)
- |   |                                  |                                    |
|---|----------------------------------|------------------------------------|
| <input type="checkbox"/> Rendering              | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Composting             | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Burial                 | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Incineration           | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Other (specify): _____ |                                  |                                    |
13. Do you dispose of **dead birds from other farms**?  Yes  No
- If YES, please provide more details \_\_\_\_\_
- \_\_\_\_\_

**Trace Back Information**

In the last 14 days, did the following movements **ONTO** the farm occur? If YES, please provide as much accurate information as possible for each unique source.

14. **Live Turkeys** (or other birds):  Yes  No  Don't know

Date?	Source?	RRT-PCR tested for avian influenza prior to moving onto your farm? (Yes/No)	Test Date?

Additional comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

15. **Feed trucks**  Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

16. **Fresh litter/bedding**  Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

17. Personnel or equipment used to **handle/haul manure** and/or used litter?

Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_  
 \_\_\_\_\_

18. **Load-out crews**  Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_

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19. **Off-site renderer**  Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_

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20. **Non-company Visitors to the Farm**  Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_

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### Trace Forward Information

In the last 14 days, did the following movements **OFF** the farm occur? If YES, please provide as much accurate information as possible for each unique off-farm destination.

21. **Live Turkeys** (or other birds)  Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_

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22. **Feed trucks** (feed from your premises, delivered to off-farm locations).

Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_

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23. Farm personnel or equipment used to haul **manure/used litter to off-farm locations.**  Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_

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24. Farm personnel or equipment used for **load-out at off-farm locations.**  Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_

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25. Farm personnel or equipment used for **off-farm carcass disposal:**  Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_

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26. People or equipment went from your farm to **another premises with birds.**  Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_

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## Appendix E: Turkey Marketing Schedule

Date of Movement	Processor (Destination)	Grower (Farm of Origin)	House No.(s)*	Number Turkeys Moving	Number Loads	Farm Depopulated? (Yes or No) <sup>#</sup>

\* The number (or identification) of the house or houses from which turkeys will be loaded onto live haul trucks.

# Will live turkeys remain on the farm after load-out has been completed?

## Appendix F: Epidemiology Questionnaire for Turkeys, Turkey Eggs, and Turkey Semen Moving to Non-Market Locations

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Farm mailing address (911): \_\_\_\_\_

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

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

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

GPS coordinates (decimal degrees) at farm gate: \_\_\_\_\_

\* Person who controls marketing decisions for this premises, i.e. when and where the house will be moved.

**Farm Information**

State Premises Identification Number: \_\_\_\_\_

Turkeys on premises:

Number: \_\_\_\_\_

Type: \_\_\_\_\_

Ages: \_\_\_\_\_

Number of turkey houses on premises: \_\_\_\_\_

Date on which turkeys or turkey eggs will move: \_\_\_\_\_

House number(s) from which turkeys or turkey Eggs will be moved: \_\_\_\_\_

Number of Truck Loads that will move: \_\_\_\_\_

Business Name of Destination: \_\_\_\_\_

Address of Destination: \_\_\_\_\_

Planned route to Destination: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Flock Health Information.**

1. Has the mortality rate exceeded 2/1,000 turkeys in the house during the preceding 14 days?  
 Yes  No
  - a. If the answer is NO, a copy of pertinent mortality records for the preceding 14 days must be submitted to the Incident Command.
  - b. Diagnostic tests conducted: \_\_\_\_\_
  - c. Test results: \_\_\_\_\_
  
2. Have you noticed unusual listlessness or depression in the turkeys in the house during the preceding 2 days?  
 Yes  No

3. Avian influenza test results (preceding 30 days)

Date	Sample Type	No. Samples Tested	Laboratory Used	Results

**Foreign Animal Disease investigators may find it helpful to sketch the location of buildings in relation to the road access on the bottom of this page.**

### Employee Risk Factors

4. Do any of your **employees work at other poultry premises** or have they visited other poultry premises, hatcheries, processing plants, or poultry slaughtering facilities within the past 14 days?  Yes  No
5. Do any of your employees **live or associate with someone who works at another poultry farm**, hatchery, processing plant, slaughter facility or rendering plant?  Yes  No
6. Have you hired **new personnel** during the past 14 days?  Yes  No
- a) If YES, did they work for another poultry premises before you hired them?  Yes  No
- b) If YES, where did they work prior to coming to your premises? \_\_\_\_\_
7. Has an employee from this premises visited a **rendering plant** within the past 14 days?  Yes  No
- If YES, what plant? \_\_\_\_\_

### Biosecurity Risk Factors

8. Have **migratory waterfowl** been seen on the ground or water within 0.62 miles (1 km) of your buildings containing turkeys in the last 14 days?  Yes  No
- If YES, please describe: \_\_\_\_\_
9. Have **free flying birds** been observed in the turkey houses in the past 14 days?  Yes  No
10. Is **feed** protected from exposure to feces from wild birds, waterfowl, rodents and/or wild mammals?  Yes  No
11. Is **water** protected from exposure to feces from wild birds, waterfowl, rodents and/or wild mammals?  Yes  No
12. Which of the following describes this farm's usual **carcass (daily mortality) disposal** method? (Mark ALL that apply)
- |   |                                  |                                    |
|---|----------------------------------|------------------------------------|
| <input type="checkbox"/> Rendering              | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Composting             | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Burial                 | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Incineration           | <input type="checkbox"/> on-farm | <input type="checkbox"/> off -farm |
| <input type="checkbox"/> Other (specify): _____ |                                  |                                    |
13. Do you dispose of **dead birds from other farms**?  Yes  No
- If YES, please provide more details. \_\_\_\_\_
- \_\_\_\_\_

**Trace Back Information**

In the last 14 days, did the following movements **ONTO** the farm occur? If YES, please provide as much accurate information as possible for each unique source.

14. **Live Turkeys** (or other birds):  Yes  No  Don't know

Date?	Source?	RRT-PCR tested for avian influenza prior to moving onto your farm? (Yes/No)	Test Date?

Additional comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

15. **Feed trucks**  Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

16. **Fresh litter/bedding**  Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

17. Personnel or equipment used to **handle/haul manure** and/or used litter?  Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_

18. **Load-out crews**

Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_

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19. **Off-site renderer**

Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_

---

20. **Non-company Visitors to the Farm**

Yes  No  Don't know

If YES, identify the source: \_\_\_\_\_

Additional comments: \_\_\_\_\_

---

**Trace Forward Information**

In the last 14 days, did the following movements **OFF** the farm occur? If YES, please provide as much accurate information as possible for each unique off-farm destination.

21. **Live Turkeys** (or other birds)

Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_

---

22. **Feed trucks** (feed from your premises, delivered to off-farm locations).  Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

---



Additional comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

23. Farm personnel or equipment used to haul **manure/used litter to off-farm locations.**  Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

24. Farm personnel or equipment used for **load-out at off-farm locations.**  Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

25. Farm personnel or equipment used for **off-farm carcass disposal:**  Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

26. People or equipment went from your farm to **another premises with birds.**  Yes  No  Don't know

If YES, identify the destination: \_\_\_\_\_

Additional comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## Appendix G: Designation of Zones, Areas, and Premises

A critical component for FAD response is the designation of zones, areas, and premises. Epidemiological investigation and tracing will be used to classify premises. It is the responsibility of the Incident Management Team to designate zones and premises in an FAD outbreak. These zones, areas, and premises designations will be used in quarantine and movement control efforts. (A [Ready Reference Guide—Overview of Zones](#) is available on the USDA website.)

Table 1 summarizes the premises designations that would be employed in an FAD outbreak response. Table 2 summarizes the zone and area designations that would be used in an FAD outbreak response.

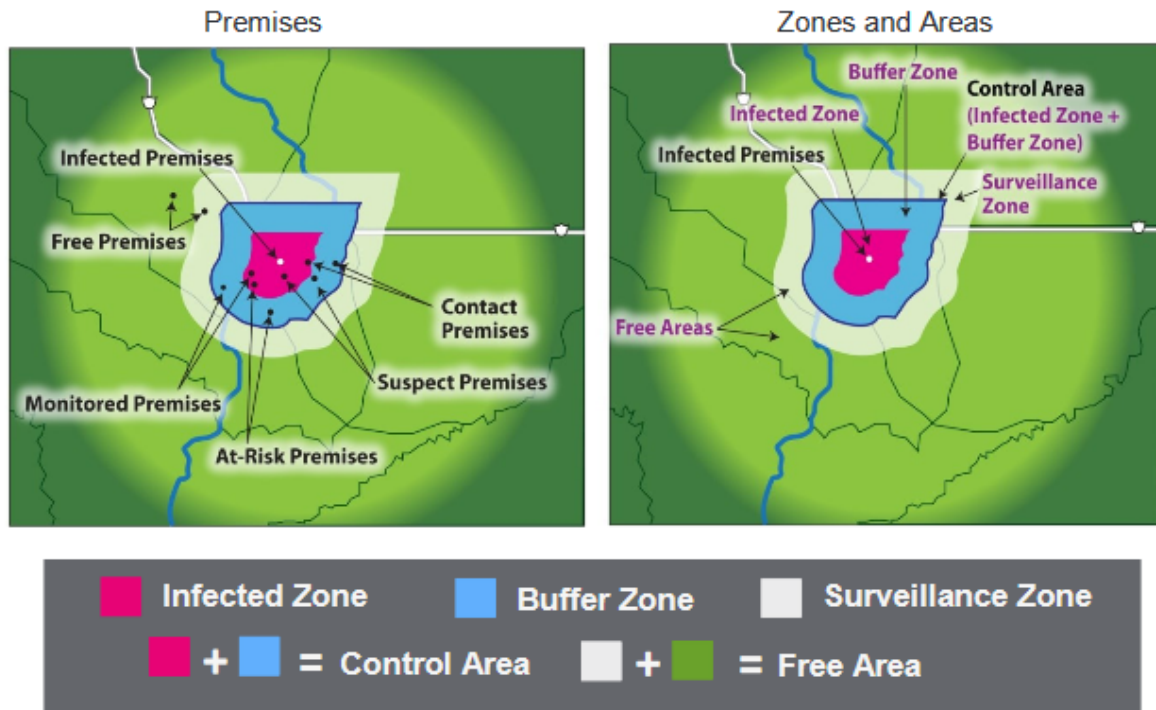
**Table 1. Summary of Premises Designations**

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

**Table 2. Summary of Zone and Area Designations**

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

Appendix Figure 1 illustrates all the zones and premises.

**Appendix Figure 1. Example Zones, Areas, and Premises**

Note: Figures are not to scale.

**In an HPAI outbreak, the Incident Commander will work with the Operations Section and Planning Section to determine the appropriate designations.**

For details on the zones, areas, and premises, please see the *APHIS Foreign Animal Disease Framework*. For additional information integrating the zones, areas, and premises designations with specific FAD response strategies, please see the disease specific response plans, such as the *Highly Pathogenic Avian Influenza Response Plan: The Red Book*.

These documents are available through the USDA APHIS FAD PReP website at:

<http://www.aphis.usda.gov/fadprep>

## Appendix H: Sampling Protocol for RRT-PCR Testing

### Probability of Detection:

The probability of detecting at least one infected bird in the group of daily dead or sick birds (daily dead) depends on the prevalence of HPAI infected dead birds, the number of dead HPAI birds tested, and the test sensitivity. For example, if there are two HPAI infected dead birds in a group of 10 dead birds, there is a higher probability of detecting HPAI presence if each 5-bird pool tested has an infected bird instead of two infected birds in one 5-bird pool and no infected bird in the other 5-bird pool.

In addition, the number of HPAI infected birds in the daily dead depends on the number of HPAI infected birds in the flock (prevalence). In turn, the number of HPAI infected birds in the flock depends on the transmission rate (number of birds newly infected by one infected bird per time period) and the length of time since HPAI was introduced into the flock.

**The probability of detection is limited by the test sensitivity of the pooled sample.** For example, with a test sensitivity of 86.5 percent, one pool containing at least one known infected bird still has only 86.5% chance of testing positive and thus only an 86.5% chance of detecting infection. Thus multiple 5-bird pool samples must be tested to exceed the required 95% or 99% confidence level even with the increased prevalence, assuming that all the infected birds don't wind up in the same pool

The samples are drawn from the daily dead or sick birds and not based on the number of birds in the house *per se*. In any size house, three sampling pools of 5 birds are required from the daily dead or sick birds. Targeting the daily sick and dead birds reduces the sample size required for the 95% confidence level because the prevalence of HPAI infected birds should be higher in this group than in the house as a whole.

Daily Probability of Detecting HPAI in Turkey Houses*	
<i>RRT-PCR Test Sensitivity 86.5 %</i>	<i>Target Population</i>
No. Pools Tested	5-Birds per Pool
1	81%
2	96%
3	99%
4	99%

\* Probability of detecting at least one HPAI-infected bird where the HPAI prevalence is 40 percent in the target population of the daily dead or sick birds (i.e., each group of 50 dead or sick birds)

## Appendix I: Truck Cleaning and Disinfection Protocol and Report

<b>Company name:</b>	<b>Facility location:</b>
<b>Driver's signature:</b>	<b>Supervisor's signature:</b>
<b>Time of the day:</b>	<b>Date:</b>

See the NAHEMS Cleaning and Disinfection Guidelines<sup>3</sup> for additional information.

1. Remove trash from tractor cab and sweep out dry soil and debris. Clean the entire interior of the tractor cab using an appropriate detergent.
2. Pre-rinse all areas of the truck and remove visible organic matter. A pressurized water source may work best for this task. (Remove accumulated ice if operating in winter weather conditions.).
3. Thoroughly clean all truck surfaces, paying particular attention to the truck bed, undercarriage, and wheels. Application of detergent foam followed by a high-pressure rinse may be most effective.
4. Apply an approved disinfectant to all truck surfaces (interior and exterior) following the safety precautions of the disinfectant manufacturer.<sup>4</sup>
5. Return vehicle to a clean area or site for next use.
6. Document all actions taken on the sanitation report.

### Truck Sanitation Report

1. *Truck driver.* Review the sanitation report for accuracy and completeness and inspect the sanitary conditions of all truck components and take a copy of the completed sanitation report with you before going to another turkey farm.
2. *Company Supervisor or designee.* Before the truck leaves the processing plant premises, review the sanitation report and inspect the truck, noting any details on form. If areas are found unacceptable, take corrective actions to make them acceptable. Note any corrective action taken on the form. Sign the form, verifying that everything was acceptable before the truck is allowed to be used at the farm. File completed and signed forms with the Incident Command.

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<sup>3</sup> URL:

[https://www.aphis.usda.gov/animal\\_health/emergency\\_management/downloads/nahems\\_guidelines/cleaning\\_disinfection.pdf](https://www.aphis.usda.gov/animal_health/emergency_management/downloads/nahems_guidelines/cleaning_disinfection.pdf)

<sup>4</sup>EPA, *Registered Antimicrobial Products with Label Claims for Avian (Bird) Flu Disinfectants*, October 20, 2015, <https://www.epa.gov/sites/production/files/2015-09/documents/list-m-avianflu.pdf>

## Appendix J: Recommended Criteria for Issuing Movement Permits for Turkeys

Only movement of live birds from Monitored Premises will be considered. Monitored Premises are located in the Infected Zone or Buffer Zone, which constitute the Control Area. Monitored Premises have susceptible birds that do not have clinical signs (or other epidemiological evidence) compatible with HPAI.

- A Monitored Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises.
- Only At-Risk Premises are eligible to become Monitored Premises.
- Monitored Premises meet a set of defined criteria in seeking to move susceptible animals or products out of the Control Area by permit.
- For the Secure Poultry Supply Plans, the following criteria must be met:
  - Pre-movement RRT-PCR testing is negative,
  - Epidemiological questionnaire is completed,
  - No unexplained mortality, no unexplained clinical signs, and no unexplained changes in production parameters, and
  - Biosecurity measures are acceptable to state and federal authorities.

In the absence of specific risk assessments, moving live birds is an unknown risk. Prior to permitting, potential contact with infected and/or epidemiologically linked flocks and the biosecurity of premises containing these flocks will be assessed. Methods to reduce the risk associated with moving live turkeys include the following:

- Pre-movement restrictions – people, equipment, and vehicles having direct or indirect contact with Infected Premises (including contact with manure, live or dead birds, work crews, or equipment from an Infected Premises) will not be allowed onto turkey farms before movement of live turkeys.
- All In, All Out – all turkeys should move within a time period approved by the IC.
- At the time of loading, mortality must be within normal limits and clinical signs associated with HPAI must be absent.
- If supplemental diagnostic tests are conducted prior to movement of turkeys, results must be reported to the IC.
- After the move, turkeys not moving to market (brooder turkeys to grower unit, replacement breeders to egg production unit) must be monitored as directed by the Incident Command.

To maintain market continuity for the turkey industry during an outbreak of HPAI, turkeys from monitored and uninfected flocks within the Control Area must be allowed to move in a manner that does not pose a risk to animal or human health. The table below provides guidance for regulatory personnel responsible for issuing permits for movement of turkeys in a Control Area during an outbreak of HPAI. If the answer to all questions is “Yes,” then it is recommended that movement permits be considered.

Immature turkeys in a brooder house must test negative by the RRT-PCR test before they will be allowed to move to a finishing house. Turkeys in a finishing house must test negative by the RRT-PCR test before a permit will be issued which allows them to move to a processing plant (see Section IV). If one or more samples test positive for the avian influenza matrix gene, samples will be further tested for H5 and H7 avian influenza genes by RRT-PCR. A positive RRT-PCR test for H5 or H7 avian influenza genes indicates the presence of Notifiable Avian Influenza (an influenza A virus of the H5 or H7 subtype). This test does not differentiate between viruses of low and high pathogenicity. However, after a Control Area has been established due to the diagnosis of HPAI, a positive RRT-PCR test for H5 or H7 avian influenza is assumed to identify HPAI.

In the absence of specific risk assessments to the contrary, movement of turkey poults from a hatchery to a brooder house is considered to pose a low to negligible risk. Restrictions on movement of poults from a hatchery to a brooder house will be limited to ensuring that the receiving facility can provide a safe environment wherein poults will not be exposed to potentially infected older turkeys.

The Interagency Risk Assessment for the Public Health Impact of Highly Pathogenic Avian Influenza Virus in Poultry, Shell Eggs, and Egg Products (May 2010, see **Appendix N**) has determined that the risk of transmitting HPAI virus to humans via the food supply is negligible.

<b>Permitting Guidance for Movement of Turkeys</b>	
1. Level 2 Biosecurity Measures are in place?	Yes
2. Traceability information is available (premises ID, GPS coordinates, other)?	Yes
3. Epidemiology questionnaire data is acceptable?	Yes
4. RRT-PCR tests are negative for samples collected during the preceding 24 hours?	Yes
5. Mortality is no more than 2/1,000 turkeys in the house for each of the preceding 7 days?	Yes
6. Visual inspection is normal within 24 hours prior to movement?	Yes
7. Fewer than 50 dead turkeys are present in the house immediately prior to loadout?	Yes
8. Drivers and trucks are biosecure; the route from the farm of origin to the grow-out house or turkey processing plant avoids poultry farms?	Yes
<b>9. Permit Guidance to Move Turkeys if all above responses are “Yes”</b>	<b>Consider Issuing MOVEMENT PERMIT</b>

## Appendix K: Recommended Criteria for Issuing Movement Permits for Turkey Hatching Eggs

Only movement of turkey hatching eggs from breeding flocks that are on Monitored Premises will be considered. Monitored Premises are located in the Infected Zone or Buffer Zone, which constitute the Control Area. Monitored Premises have susceptible birds that do not have clinical signs (or other epidemiological evidence) compatible with HPAI.

- A Monitored Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises.
- Only At-Risk Premises are eligible to become Monitored Premises.
- Monitored Premises meet a set of defined criteria in seeking to move susceptible animals or products out of the Control Area by permit.
- For the Secure Poultry Supply Plans, the following criteria must be met:
  - Pre-movement RRT-PCR testing is negative,
  - Epidemiological questionnaire is completed,
  - No unexplained mortality, no unexplained clinical signs, and no unexplained changes in production parameters, and
  - Biosecurity measures are acceptable to state and federal authorities.

In the absence of specific risk assessments, moving turkey hatching eggs or semen is an unknown risk. Prior to permitting, potential contact with infected and/or epidemiologically linked flocks and the biosecurity of premises containing these flocks will be assessed. Measures to reduce the risk associated with moving turkey hatching eggs or semen include the following:

- Pre-movement restrictions – people, equipment, and vehicles having direct or indirect contact with Infected Premises (including contact with manure, live or dead birds, work crews, or equipment from an Infected Premises) will not be allowed onto turkey breeder farms before movement of hatching eggs or semen.
- For hen breeder farms or tom breeder farms that do not have their own on-farm artificial insemination crews, artificial insemination crews must visit only one farm per day. Crew members must shower and don clean clothes and disposable boots or boots which have been cleaned and disinfected between farm visits.
- Pre-movement active surveillance by RRT-PCR testing of turkey breeding toms and hens on farms in a Control Area (see Section IV). Holding turkey hatching eggs for 2 days prior to movement allows sufficient time for two RRT-PCR tests to be conducted and reduces the likelihood of moving contaminated eggs or semen before HPAI infection is detected. For example, eggs produced on Monday could be moved on Wednesday after receiving 2 negative RRT-PCR test results from the turkey breeder flock of origin on Tuesday and Wednesday.
- Requiring house mortality, egg production, and clinical signs to be within normal limits prior to movement of semen or eggs from turkey breeding farms (see Section V).
- Biosecurity protocols for turkey hatching eggs and day-old poults (see **Appendix C**).
- Reduction in the frequency of semen movement from twice weekly to once weekly.



Turkey breeder hens and toms producing fertile hatching eggs must test negative for avian influenza matrix genes by the RRT-PCR test before hatching eggs will be allowed to move from a breeder farm to a hatchery or semen will be allowed to move from a tom breeder farm to a hen breeder farm (see Section IV). If one or more samples test positive for the avian influenza matrix gene, samples will be further tested for H5 and H7 avian influenza genes by RRT-PCR. A positive RRT-PCR test for H5 or H7 avian influenza genes indicates the presence of Notifiable Avian Influenza (an influenza A virus of the H5 or H7 subtype). This test does not differentiate between viruses of low and high pathogenicity. However, after a Control Area has been established due to the diagnosis of HPAI, a positive RRT-PCR test for H5 or H7 avian influenza is assumed to identify HPAI.

To maintain market continuity for the turkey industry during an outbreak of HPAI, turkey hatching eggs and semen from monitored and uninfected flocks within the Control Area must be allowed to move in a manner that does not pose a risk to animal or human health. The table below provides guidance for regulatory personnel responsible for issuing permits for movement of turkey hatching eggs and semen in a Control Area during an outbreak of HPAI. If the answer to all questions is “Yes,” then it is recommended that movement permits be considered.

<b>Permitting Guidance for Movement of Turkey Hatching Eggs and Turkey Semen</b>	
1. Level 2 Biosecurity Measures are in place?	Yes
2. Traceability information is available (premises ID, GPS coordinates, other)?	Yes
3. Epidemiology questionnaire data is acceptable?	Yes
4. RRT-PCR tests are negative for samples collected from turkey breeder flocks on each of 2 consecutive days before moving turkey hatching eggs or semen?	Yes
5. Mortality is no more than 2/1,000 turkeys in the turkey breeder house immediately prior to moving hatching eggs or semen?	Yes
6. Egg production is within normal limits (total decline of less than 15%) during the two-day period prior to movement of turkey hatching eggs?	Yes
7. Visual inspection is normal in turkey breeder houses within 24 hours prior to movement?	Yes
8. Drivers and trucks are biosecure; the route from the turkey breeder tom farm to the turkey breeder hen farm or from the turkey breeder hen farm to the hatchery avoids as many poultry farms as possible?	Yes
9. Permit Guidance to <b>Move Turkey Eggs or Semen if all above responses are “Yes”</b>	<b>Consider Issuing MOVEMENT PERMIT</b>

## Appendix L: Example Initial Permit for Movement of Turkey Hatching Eggs

### INITIAL PERMIT FOR MOVEMENT OF TURKEY HATCHING EGGS

**PERMIT NUMBER: XX.0**

**DATE OF PERMIT:**

\*xx is premises number; initial permits will be numbered zero.

Shipment is permitted from \_\_\_\_\_ (premises name & address)

to \_\_\_\_\_ (hatchery name & address).

- ❖ Drivers and trucks used for movement of turkey hatching eggs are biosecure as defined in the Secure Turkey Supply Plan Appendix I: Truck Cleaning and Disinfection Protocol and Report.
- ❖ Egg pick-up drivers shall not enter poult processing areas, conduct poult deliveries, or handle poults on the same day that they have delivered eggs to the hatchery.
- ❖ Turkey hatching eggs must be moved directly and only to the above designated hatchery, on the route authorized by the Incident Command (IC).
- ❖ The State Animal Health Official of the State of destination must receive a copy of the restricted movement permit within 24 hours of issuance.

The premises of egg origin has **at least all Level 2 Biosecurity Measures** in place, as defined in the Secure Turkey Supply Plan Appendix B, and all of the below product specific stipulations:

#### Egg Farm Operations

- ❖ Farm-specific materials must be used for gathering eggs.
- ❖ Hatching eggs must be packed in either new disposable materials or plastic materials that were previously cleaned and disinfected at the hatchery.
- ❖ Hatching eggs must be washed and sanitized with a chlorine rinse with at least a 200 ppm concentration or with an EPA registered disinfectant for avian influenza virus according to the manufacturer's label directions for application on hatching eggs.
- ❖ If flats are taken into a hen house, eggs must be washed and sanitized while on the flats or transferred to clean flats after being washed or sanitized. Employees who manually transfer eggs must wash their hands with soap and water or use a hand sanitizer immediately before doing so.
- ❖ Farm personnel should disinfect the egg storage room floor and buggy wheels before buggies are moved for loading; or egg buggies must be washed and sanitized immediately prior to moving into an egg storage room cooler, being careful to cover the entire circumference of the buggy wheels.
- ❖ Farm personnel should don disposable gloves and disposable boots or boots which have been cleaned and disinfected immediately before entering egg storage coolers.
- ❖ Disinfectants for hard and nonporous surfaces will be selected from EPA registered products or from other products shown to be efficacious against avian influenza viruses. These products include acetic acid (5%), citric acid (1% and 3%), calcium hypochlorite (750 ppm), sodium hypochlorite (750 ppm), laundry detergent with peroxygen (bleach), and commercially available iodine/acid disinfectant.
- ❖ Mortality is no more than 2/1,000 turkeys in the turkey breeder house in the 24 hours prior to moving hatching eggs.
- ❖ Egg production is within normal limits (total decline of less than 15%) during the two-day period prior to movement of turkey hatching eggs.
- ❖ Eggs are held in the egg storage room for 2-days after production (collection) before hatching eggs are moved from the premises.
- ❖ Visual inspection is normal in turkey breeder houses within 24 hours prior to movement.
- ❖ Epidemiology Questionnaire data is complete and acceptable.

And the receiving premise meets the below stipulations:

**Receiving Hatchery Operations**

- ❖ Egg deliveries to the hatchery and transfer of hatching eggs into setters must be conducted after hatching and poult processing operations on the same day have been completed or have separate personnel performing these functions.
- ❖ If the hatchery has a loading dock that is used for hatching eggs and poults, poults must leave the loading dock before eggs are received or hatchery loading docks, connecting passages, and receiving storage areas must be cleaned and disinfected with an EPA registered disinfectant after receiving each truckload of hatching eggs.
- ❖ Egg contents leaked onto hatchery floors must be cleaned and disinfected according to hatchery SOP as soon as possible.
- ❖ Employees must wash their hands with soap or apply a hand sanitizer before entering the hatcher room or poult processing rooms as well as prior to leaving the hatchery. Employees must take precautions to prevent the transfer of microbial contamination into the poult processing room via shoes by utilizing a foot bath or clean disposable shoe covers.
- ❖ Egg-handling materials shall be returned to the premises of origin after at least 24 hours have elapsed since these materials were moved from the farm and without contacting materials going to other premises.

If all the above are true, a permit can be issued to move turkey hatching eggs directly to a hatchery after two negative real-time reverse transcriptase polymerase chain reaction (RRT-PCRs) tests on pooled samples from five dead birds from every house on the premises for two consecutive days prior to movement of turkey eggs. The time interval between collection of samples on consecutive days must be at least 18 hours. Samples will consist of 5-bird pooled sample for each 50 dead turkeys. If there are less than 5 dead turkeys in the house, the remainder of the samples should be taken from sick turkeys. (The test must be conducted by a National Animal Health Laboratory Network laboratory.)

**Dates of two consecutive negative RRT-PCR tests for Notifiable Avian Influenza (HPAI):** \_\_\_\_\_ / \_\_\_\_\_

(This permit allows movement of eggs from the premises of origin until the next day's RRT-PCR test results are available).

**This permit is valid ONLY if copies of the two current negative RRT-PCR test results for this flock are attached.**

I certify that the flock of origin of the turkey hatching eggs has met the permit criteria as stated in the Secure Turkey Supply Plan and the destination farm has met the above requirements.

\_\_\_\_\_  
 Incident Commander Signature                      Printed Name                      Date (mm/dd/yyyy)

I certify that the production parameters for the flock of origin of the turkey hatching eggs are within normal range on the date of shipment.

\_\_\_\_\_  
 Premises Manager Signature                      Printed Name                      Date of shipment (mm/dd/yyyy)

*The IC may issue the initial permit as soon as negative RRT-PCR test results have been received if the premises is compliant with the permit guidance. Subsequent permits for movement of this product may be issued by the premises manager unless a significant change in production parameters occurs, the flock is found to have a positive RRT-PCR result for HPAI, or some other significant event occurs such as the onset of obvious clinical signs of HPAI or a determination is made that the flock is a Contact Premises. On an ongoing basis, the IC will monitor RRT-PCR results from each flock and will review flock production parameters to confirm the flock continues to be eligible for this permit.*

## Appendix M: Example Subsequent Permit for Movement of Turkey Hatching Eggs

### SUBSEQUENT PERMIT FOR MOVEMENT OF TURKEY HATCHING EGGS

**PERMIT NUMBER: XX.1**

**DATE OF PERMIT:**

\*xx is premises number; subsequent permits should be renumbered 2, 3, 4, and so on.

Shipment is permitted from \_\_\_\_\_ (premises name & address)

to \_\_\_\_\_ (hatchery name & address).

- ❖ Drivers and trucks used for movement of turkey hatching eggs are biosecure as defined in the Secure Turkey Supply Plan Appendix I: Truck Cleaning and Disinfection Protocol and Report.
- ❖ Egg pick-up drivers shall not enter poult processing areas, conduct poult deliveries, or handle poult on the same day that they have delivered eggs to the hatchery.
- ❖ Turkey hatching eggs must be moved directly and only to the above designated hatchery, on the route authorized by the Incident Command (IC).
- ❖ The State Animal Health Official of the State of destination must receive a copy of the restricted movement permit within 24 hours of issuance

This permit is only valid if accompanied by a negative RRT-PCR test for HPAI conducted on a pooled sample of oropharyngeal swabs from 5 dead birds out of every 50 dead birds from each house on the premises. (The test must be conducted by a National Animal Health Laboratory Network laboratory)

Dates of shipment: \_\_\_\_\_.

Dates of two consecutive negative RRT-PCR tests for Notifiable Avian Influenza (HPAI): \_\_\_\_\_ / \_\_\_\_\_

(This permit allows movement of eggs from the premises of origin until the next day's RRT-PCR test results are available).

**This permit is valid ONLY if copies of the two current negative RRT-PCR test results for this flock are attached.**

I certify that:

- ❖ The production parameters for the flock of origin of the turkey day-old poult are within normal range on the date of shipment.
- ❖ This premises and the receiving brooder premises comply with the permit regulations set out in Initial Permit # \_\_\_\_0.

\_\_\_\_\_  
Premises Manager Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Date of shipment (mm/dd/yyyy)

#### Emergency Contact Information

*The IC may issue the initial permit as soon as negative RRT-PCR test results have been received if the premises is compliant with the permit guidance. Subsequent permits for movement of this product may be issued by the premises manager unless a significant change in production parameters occurs, the flock is found to have a positive RRT-PCR result for HPAI, or some other significant event occurs such as the onset of obvious clinical signs of HPAI or a determination is made that the flock is a Contact Premises. On an ongoing basis, the IC will monitor RRT-PCR results from each flock and will review flock production parameters to confirm the flock continues to be eligible for this permit.*

## Appendix N: Public Health Risk Assessment for Movement of Infected But Undetected Turkeys Out of, Within, and Into a Control Area During an Outbreak of Highly Pathogenic Avian Influenza\*

1. **Public Health Risk Assessment.** The United States Department of Agriculture's (USDA) Food Safety and Inspection Service (FSIS) developed a quantitative public health risk assessment for the highly pathogenic avian influenza virus (HPAI) in turkey products for human consumption in collaboration with the Department of Health and Human Services' (DHHS) Food and Drug Administration (FDA) and USDA's Animal and Plant Health Inspection Service (APHIS). The risk assessment was developed by an Interagency Workgroup formed from representatives of each of these three agencies.

This risk assessment included: 1) an estimate of the exposure and potential human illness from consumption of HPAI-contaminated turkey from the index flock, and 2) examined the effectiveness of mitigation strategies to control HPAI if detected in the United States. The risk assessment was completed in May 2010 and the complete title is "Interagency Risk Assessment for the Public Health Impact of Highly Pathogenic Avian Influenza Virus in Poultry, Shell Eggs, and Egg Products."

2. **Public Health Context.** Avian influenza viruses are typically species-specific, causing disease in birds. However, HPAI H5N1 and other H5 and H7 subtypes have recently become a zoonotic concern. In June 2011, the World Health Organization (WHO) reported that worldwide from 2003-2011, there have been 555 confirmed HPAI human illnesses, resulting in 324 deaths. Retrospective studies have determined that the majority of these cases are associated with close contact with live or dead HPAI-infected birds likely caused by respiratory inhalation of infective droplets or self-inoculation (*e.g.*, by a human handler touching their mucous membranes or conjunctiva after contact with avian feces, avian respiratory secretions, or avian body fluids), rather than consumption of poultry or shell eggs or egg products.

Currently, there is no compelling epidemiological evidence linking the consumption of cooked poultry meat, shell eggs, or egg products to human illness caused by HPAI. HPAI is not considered to be a foodborne pathogen although the virus has been isolated from poultry muscle and the interior of eggs. Two HPAI-confirmed human illnesses may have been related to the consumption of infected raw duck blood products, although contact with live or dead HPAI-infected poultry could not be epidemiologically excluded. Despite this lack of evidence, the possibility of poultry and egg consumption as an exposure route for HPAI remains a concern to food safety experts. In light of this and the recent HPAI poultry and human illnesses in Asia, Africa, Europe, and the Middle East, the Interagency Workgroup developed the 2010 food safety risk assessment for HPAI exposure and illnesses in humans from consumption of poultry meat, shell eggs, and egg products.

3. **Model Approach.** The risk assessment model simulates human exposure and potential illness from consumption of HPAI H5 and H7 strains that can make humans ill and lead to death. Exposure to HPAI is modeled separately for poultry meat and consists of three modules representing: 1) production, 2) processing, and 3) consumer preparation. The production module assumes introduction of HPAI into the index flock of a single U.S.

meat poultry house following HPAI entry into the U.S. A bird-to-bird transmission model simulates HPAI spread to estimate within-flock prevalence of HPAI at the farm and for poultry meat production, during transportation. For an infected flock destined for meat production, the transmission model simulates an increase in the prevalence of HPAI in the flock until substantial bird mortality would allow the disease to be detected or the undetected flock is sent to slaughter. In the processing module, it was assumed birds sent to slaughter are subject to federal inspection, which could result in the removal of infected birds. The likelihood an infected bird is identified due to visible pathology was dependent on how long the bird was infected before slaughter. The amount of HPAI virus in each serving of poultry is related to the time between infection and slaughter. The consumer preparation module examines the impact of cooking and cross-contamination on levels of HPAI, thereby resulting in estimates of the level of HPAI ingested by the consumer. The predicted amount of contaminated poultry meat available for human consumption is used along with a dose-response function to estimate the number of potential human illnesses. Other routes of exposure such as inhalation, mucosal contact, and wound exposures by food preparers and consumer contact with contaminated raw poultry, as well as farm and processing occupational exposures, are not addressed in this risk assessment.

4. **Turkey Model Results.** This risk assessment has been developed as a tool to evaluate mitigation scenarios should HPAI be identified in the U.S. Using scenario analysis, the following was found:
- If the turkeys in the house are exposed to HPAI, the model predicts a **98% probability that a turkey house would be identified as HPAI-positive before slaughter and not enter commerce.** This is because houses infected early in the grow-out period will have enough time to demonstrate significant mortality ( $\geq 2\%$  flock mortality over a single day) on the farm, resulting in identification of the turkeys in the house as HPAI-positive.
  - There is a **2% probability that birds from an HPAI-infected turkey house may go to slaughter without detection** of the disease. This would happen when HPAI infects turkeys that are approaching market weight with not enough time for the house to demonstrate significant mortality. In these instances, some fraction of HPAI-contaminated poultry meat may enter commerce.
  - On-farm HPAI testing as a potential mitigation strategy has the greatest impact of lowering predicted illnesses. Approximately **95% of illnesses are mitigated if houses are tested immediately before being sent for slaughter.**
  - Increased on-farm surveillance of daily house mortality is predicted to reduce human exposure and illness. However, the model predicts that relying on a **single day of house mortality to identify all HPAI-infected, but undetected houses is impractical.** This is because a house may have few dead birds if infected late in its grow-out period as about 36 to 42 hours are required before infected birds die from HPAI.

\*Interagency Risk Assessment for the Public Health Impact of Highly Pathogenic Avian Influenza Virus in Poultry, Shell Eggs, and Egg Products, May 2010. Available at:

[https://www.fsis.usda.gov/wps/wcm/connect/955e7a9a-24f8-4b31-9826-56485c06eab7/HPAI\\_Risk\\_Assess\\_May2010.pdf?MOD=AJPERES](https://www.fsis.usda.gov/wps/wcm/connect/955e7a9a-24f8-4b31-9826-56485c06eab7/HPAI_Risk_Assess_May2010.pdf?MOD=AJPERES)

## Appendix O. Cross-Commodity Pre-Movement Isolation Period (PMIP)

**TO MOVE BIRDS DURING AN HPAI OUTBREAK, PRODUCERS NEED TO AGREE TO A PMIP FOR A SET NUMBER OF DAYS PRIOR TO MOVEMENT. DURING THE PMIP:**

1. **No live or dead poultry will be moved onto or off the premises.**
2. **Only critical operational visits to the premises will continue.**
3. **Manure, litter, and garbage will not be removed from the premises; the producer is responsible for managing the risks associated with any on-site movement that must occur.**
4. **Enhanced biosecurity for people and vehicles; no off-site equipment will be pre-staged.**

**GOAL:** for producers to actively and effectively implement enhanced biosecurity procedures in the critical time period before live poultry is moved, thus reducing the risk of lateral HPAI transmission.

### What is PMIP?

- The Pre-Movement Isolation Period (PMIP) is a critical biosecurity component of the process to obtain a continuity of business permit that involves a defined period of greatly intensified biosecurity for an entire premises prior to permitted movement of live poultry.
- The PMIP is a component of the Secure Poultry Supply Plan, which provides guidelines for poultry premises that seek to move poultry products or live poultry within, into, or out of a regulatory Control Area during an HPAI outbreak.

### What poultry movements require a PMIP?

- The PMIP is required for these live poultry movements:
  - **Terminal movements** (e.g., broilers to processing, turkeys to processing).
    - All out movements, and
    - Movements that do not remove all birds from a premises (e.g., multi-age premises).
  - **Transfer movements** (i.e., live bird movements between farms)
    - All out movements, and
    - Movements that do not remove all birds from a premises.
- These live poultry movements have a moderate to high risk of causing lateral disease transmission if infected but undetected poultry are moved.
- Movement of poultry that are infected but undetected will have subsequent epidemiologic, regulatory, and economic consequences.

### What poultry movements do not require a PMIP?

- The PMIP does not apply to day-old chicks or poults (however, a post-move quarantine does apply to these birds).
- The PMIP does not apply to poultry by-products (except as specifically related to live bird movement).
- The PMIP does not apply to eggs or egg products.

### **When does the PMIP start and end?**

- The PMIP starts the specified number of days prior to the scheduled movement date and ends when load-out begins (i.e., the hours or days of load-out are not considered part of the PMIP).
- The load-out period begins when the first crew, vehicle, or equipment arrives on the premises and ends when the last load of birds departs the premises. Pre-staging of equipment during the PMIP is prohibited.

### **How long is the PMIP?**

- The PMIP takes place for a defined number of days immediately prior to the permitted movement of poultry. This period is as follows (determined by some combination of 95% probability of detection for the type of poultry, the type of housing [contact rate], and the characteristics of HPAI viruses [mean death time], as well as by the ultimate consequences of moving an infected, undetected specific type of flock):
  - For 8 days prior to movement of turkeys to processing
  - For 5 days prior to movement of broilers to processing
- Movements of other types of live poultry may not be advised or may require additional post-movement quarantine.

### **What critical operational visits to a premises may continue during the PMIP (when specific biosecurity measures are in place)? *Please defer to designated regulatory officials to determine what types of movements require a permit in the Control Area; while these critical operational visits need to continue during the PMIP, a permit may or may not be required.***

1. Feed delivery in a dedicated truck directly from a stand-alone feed mill (i.e., no poultry on feed mill site). Trucks delivering individual feed ingredients that are stored on poultry premises will require a permit.
2. Emergency repair of critical mechanical equipment.
3. Service visits to address changes in bird health.

### **What is the specific biosecurity for these critical operational visits?**

- People who have contact with other poultry must shower and change clothes before entering the premises and also wear necessary protective clothing and footwear as described in appropriate biosecurity protocols.
- All vehicles and equipment will be cleaned and disinfected prior to entering premises.

### **What activities are prohibited during PMIP?**

Activities that pose a risk for lateral transmission of HPAI virus are prohibited. Specific prohibited activities are:

1. Off-farm disposal of mortality is prohibited. Risks associated with dead birds on-site must be managed.
2. Off-farm removal of manure or litter is prohibited. Risks associated with manure or litter movement on-site must be managed.
3. Off-farm garbage disposal is prohibited. Risks associated with garbage storage on-site must be managed.



4. Visiting other poultry farms is prohibited for people who work on poultry farms. People should have contact only with their assigned flock.
5. All non-critical visitors are prohibited from entering farms. All non-critical, routine, or operational visits must be replaced by telephone communication or must be scheduled outside of the PMIP. Non-critical visitors who work with or have contact with another commercial poultry operation (farm, hatchery, processing plant, etc.) or have contact with a noncommercial poultry flock (backyard birds, hobby farms with birds, or game birds) are prohibited from entering farms.
6. Entering a poultry house is prohibited unless the person is wearing clothing dedicated to the farm and footwear dedicated to the house.
7. Noncritical equipment from off-site is prohibited from being moved on-site.
8. Moving live poultry onto or off the premises is prohibited.

### **Why is the PMIP critical?**

- The PMIP biosecurity requirements will minimize the likelihood of a flock being exposed to HPAI close to its scheduled movement date.
- The PMIP will increase the likelihood of detection of an infected flock prior to movement of birds.
- The PMIP will decrease the likelihood of moving infected but undetected poultry, thus reducing the risk of lateral transmission of HPAI virus from specific categories of live poultry.
- The PMIP assists regulatory officials evaluating movement permit requests, since producers seeking permits will actively document, for the record, that they have achieved specific biosecurity requirements.

### **How does the PMIP work?**

- Signs of disease take time to develop following exposure to and infection with HPAI virus.
- If a flock is exposed to HPAI virus close to its scheduled movement date, signs of disease (or significant disease spread and mortality) within the flock may not be evident yet, and thus the probability of virus detection is relatively lower.
- If the flock is exposed to and becomes infected with HPAI virus prior to the implementation of the PMIP, disease signs of HPAI are likely to be detected by the day of scheduled movement (i.e., by the end of the PMIP); thus, movement can be halted and the flock is unlikely to pose a movement-associated risk.

### **What can be done for birds scheduled to move before a PMIP can be completed?**

- When a Control Area is first established or is expanded, some flocks newly in that Control Area may already be scheduled to move before a full PMIP can be completed. Additionally, rapid marketing to reduce the susceptible poultry population in a Control Area may be beneficial for HPAI outbreak control, provided that birds can be moved in a biosecure manner. In such situations, PMIP biosecurity measures should be implemented as soon as possible, and additional information must be provided to the designated regulatory officials to request movement prior to a full PMIP.
- Additional information that must be provided to the designated regulatory officials includes: mortality and morbidity data, test results, destination premises location, farm

visitor and farm activity records from the days prior to the Control Area designation, additional equipment requirements, route to be used for transport, defined load-out duration and situation, and defined biosecurity and downtime protocols for load-out crews.