

Poultry Grower Webinar Series: Biosecurity Can Keep Avian Influenza Out of Your Poultry House

James A. Roth, DVM, PhD

Center for Food Security and Public Health

College of Veterinary Medicine

Iowa State University



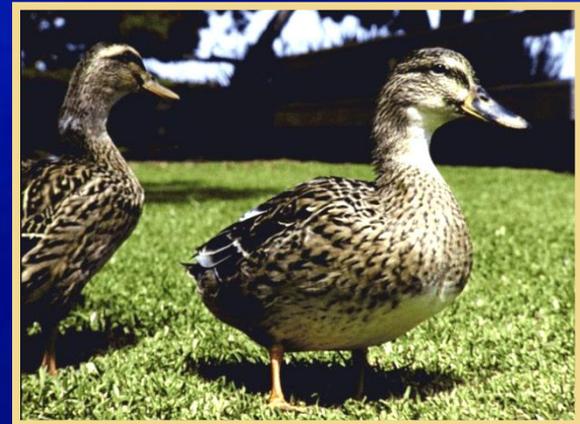
IOWA STATE UNIVERSITY®

Topics for Today's Webinar

- Background on avian influenza
- How did the H5N2 HPAI virus get to the US and spread?
- Biosecurity to Control Introduction of Avian Influenza

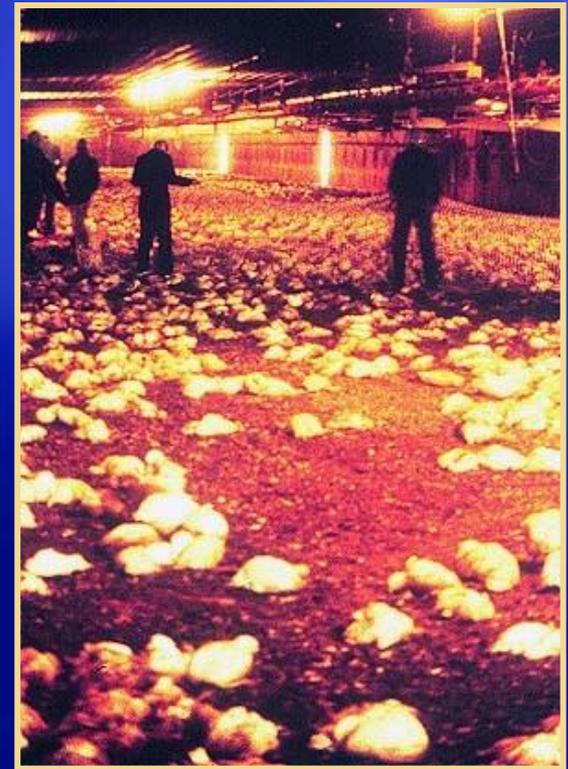
Influenza A Reservoir

- Wild waterfowl and migrating birds are reservoir
- 16 H and 9 N types - low pathogenicity in waterfowl
- Virus shed in feces and respiratory



High Pathogenicity vs Low Pathogenicity Avian Influenza

- LPAI- asymptomatic to mild infection
- HPAI – can have 100% morbidity and mortality, many body systems affected



Human Infections with Avian Influenza

- Avian influenza in humans: sporadic infections, some fatal
 - H5N1, H7N9, H7N7 – **Not in this hemisphere**
- New strains of H5 avian influenza detected in Canada and US fall 2014
 - H5N8, H5N2, H5N1
 - **Did not infect people**

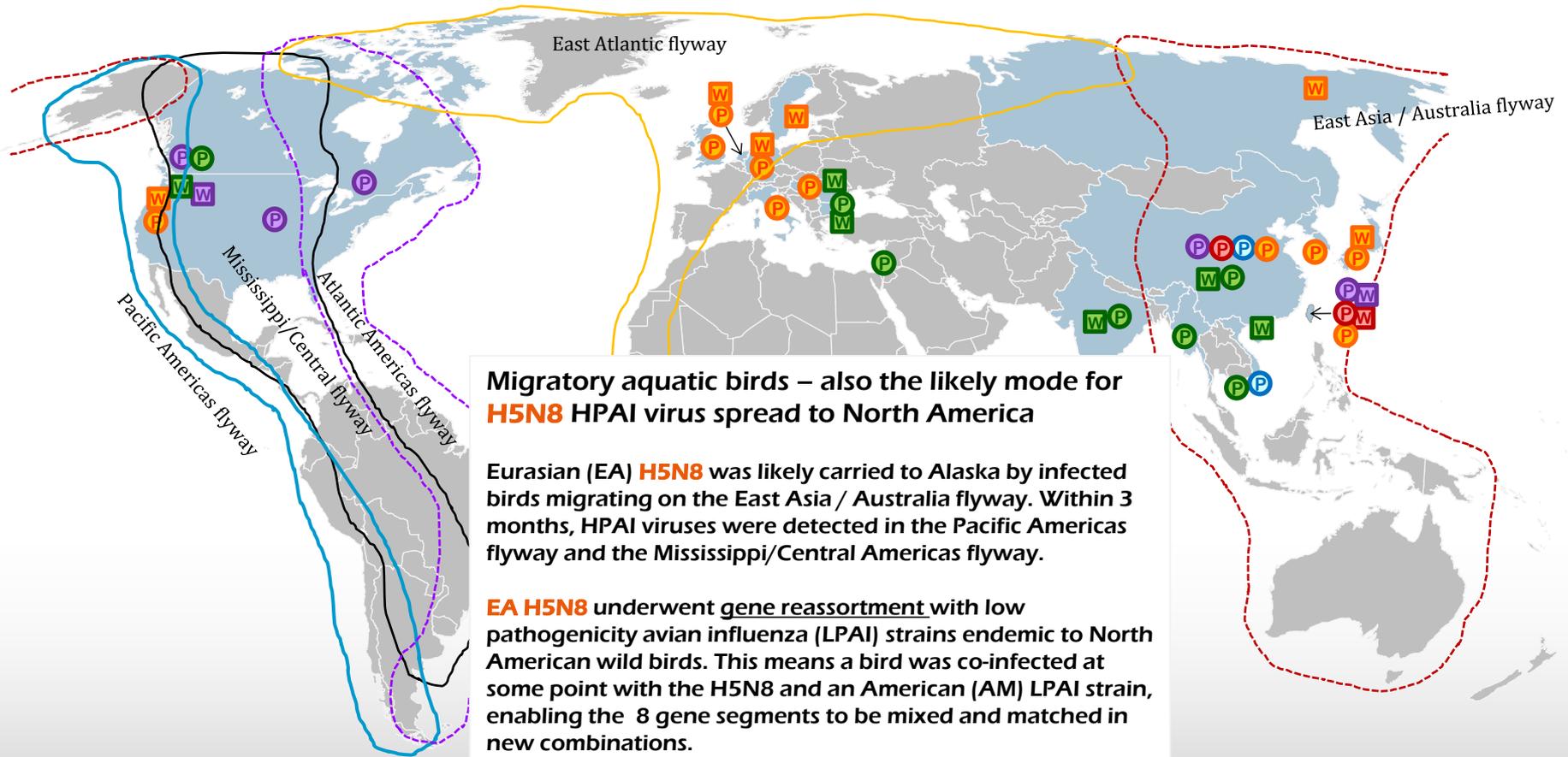
H5N1 Avian Influenza

- 2004/2005 – H5N1 emerged in Asia, killed millions of poultry and infected people with high mortality rate
- Concern that H5N1 would spread through migrating waterfowl from flyways in Europe/Asia to the Western hemisphere
- Extensive surveillance programs established in U.S.
- No detections of this strain of H5N1 in Western hemisphere

How did the highly pathogenic avian influenza viruses get to the US and spread?

H5 HPAI reports from North America

November 2014 through April 8, 2015 (OIE)



Migratory aquatic birds – also the likely mode for H5N8 HPAI virus spread to North America

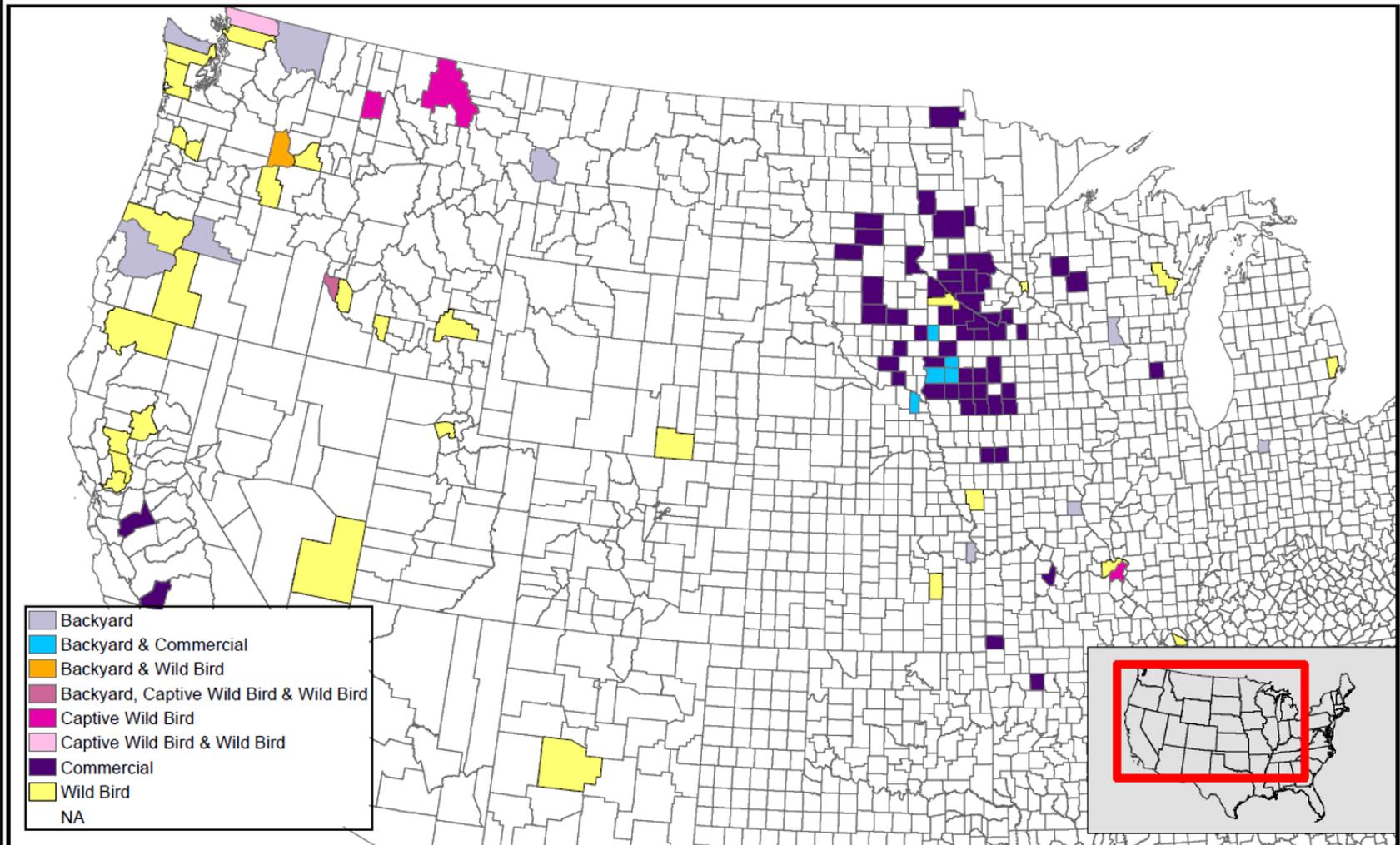
Eurasian (EA) H5N8 was likely carried to Alaska by infected birds migrating on the East Asia / Australia flyway. Within 3 months, HPAI viruses were detected in the Pacific Americas flyway and the Mississippi/Central Americas flyway.

EA H5N8 underwent gene reassortment with low pathogenicity avian influenza (LPAI) strains endemic to North American wild birds. This means a bird was co-infected at some point with the H5N8 and an American (AM) LPAI strain, enabling the 8 gene segments to be mixed and matched in new combinations.

EA/AM H5N1 and EA/AM H5N2 isolates in the western and central US were reassortants that contained genes of North American and Eurasian origin.

- | | | | | |
|--------------------|--------------------|--------------------|--------------------|--------------------|
| H5N1 in wild birds | H5N2 in wild birds | H5N3 in wild birds | H5N6 in wild birds | H5N8 in wild birds |
| H5N1 in poultry | H5N2 in poultry | H5N3 in poultry | H5N6 in poultry | H5N8 in poultry |

Figure 5. All HPAI Detections in All Birds, by Type, as of 8/13/2015 (as reported on www.aphis.usda.gov) *one or more detections may have occurred in county



USDA, APHIS, VS
 Center for Epidemiology and Animal Health
 2150 Centre Ave.
 Fort Collins, CO 80526

Data Source:
 Provided by Requestor



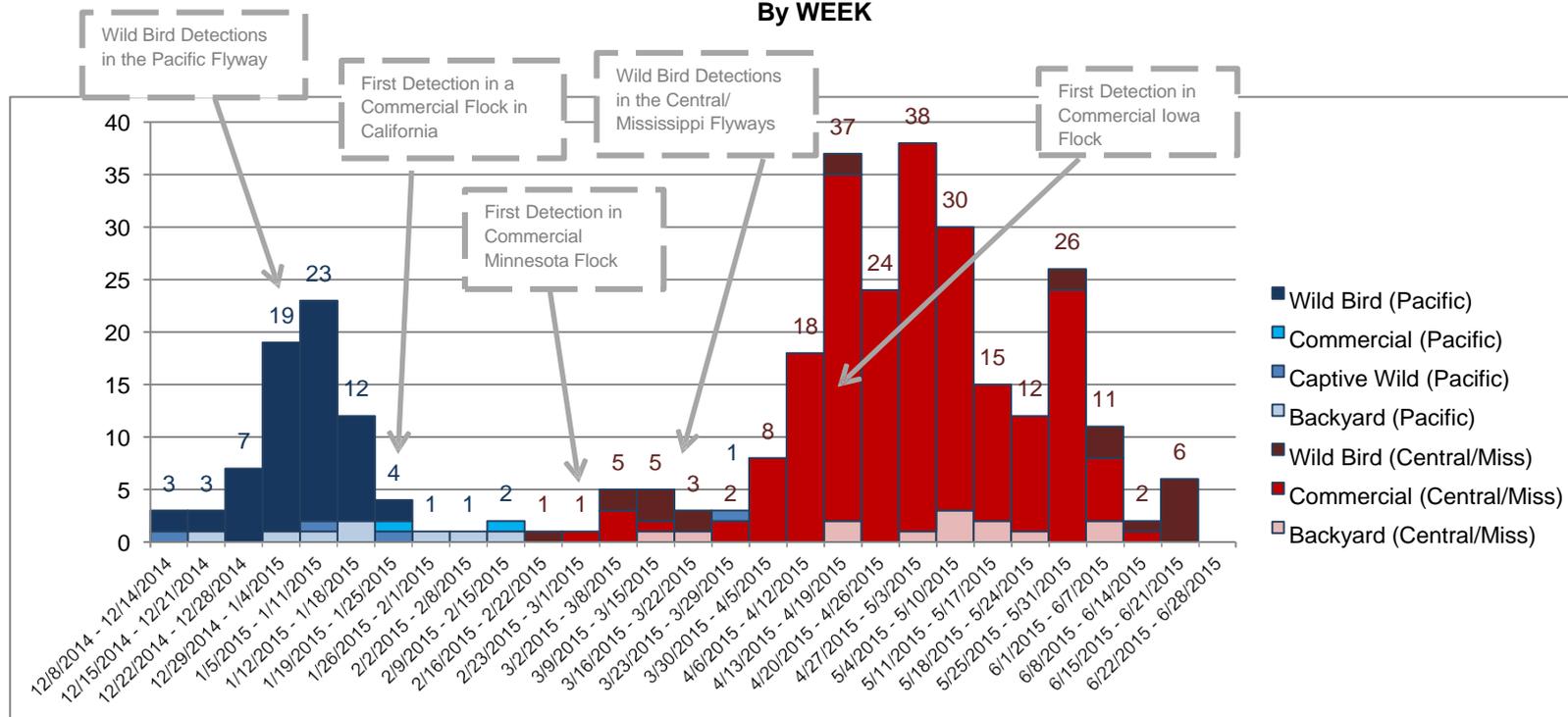
0 100 200 300 400 Miles

Date Created: August 13, 2015
 Time Created: 12:01:45 PM MST

Coordinate System: North America Albers Equal Area Conic

These data, and all the information contained therein, have been collected by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), or by its cooperators on APHIS' behalf, for restricted government purposes only and is the sole property of APHIS. Data may be disseminated on a need-to-know basis only and must be used for their intended government purpose(s). All information contained within these data are subject to required Federal safeguards and shall only be shared and/or used consistent with the Trade Secrets Act [18 U.S.C. 1905], the Privacy Act of 1974, as amended [5 U.S.C. 552a], the Freedom of Information Act [5 U.S.C. 552], the confidentiality provisions of the Food Security Act of 1985 [7 U.S.C. 2276], Section 1619 of the Food, Conservation, and Energy Act of 2008 [7 U.S.C. 8791], and other applicable Federal laws and implementing regulations, as well as with the confidentiality or non-disclosure provisions of any other agreement entered into between APHIS and a cooperator.

Figure 7. Premises Detected for ALL STATES Including WILD BIRD detections from 12/8/2015 to 7/2/2015
By WEEK



- ◆ Earliest available date indicating clinical signs is used for figure. For most premises, this is the date of clinical signs, a suspect status, or a presumptive positive status. Some premises may only have a confirmed positive status date.
- ◆ 320 detections (4 captive wild bird; 21 backyard flocks; 211 commercial flocks; 84 wild birds).
 - Only full weeks (7 days) are pictured; in addition to the dates pictured, there have been **no detections** after 6/28/2015.
 - All captive bird, backyard flock, and commercial flock data are from EMRS.
 - Wild bird dates are based on date of collection, from USDA/USGS/National Flyway Council data.
 - This represents 80% of the captive bird detections, 100% of all other detections.
 - Figures may change slightly as data is added to EMRS (e.g., date of clinical signs).

Iowa Poultry Production

In March 2015:

- Iowa had 59.5 million egg layer chickens in 3,821 laying facilities (1st in US egg production)
- 16.5 billion eggs produced annually (17% of national production)
- Raise over 11 million turkeys (9th in US turkey production) on about 200 farm sites

Highly Pathogenic H5N2 Avian Influenza in Iowa

Total Poultry Affected (6/8/2015)	31,502,052
Layers	24,725,086
Pullets	5,624,336
Turkeys	1,128,729
Hatchery	18,791
Backyard Flocks	5,110

April 13 to June 16, 2015

77 infected sites

- 6 "Backyard" sites
- 71 Commercial sites



Preparedness for
the Potential
Return of Highly
Pathogenic Avian
Influenza

Biosecurity to Control Introduction of Avian Influenza

The structural and operational biosecurity of large caged layer and turkey facilities has proven to be effective for control of endemic diseases

However, the current level of biosecurity failed to protect these facilities from the highly pathogenic H5N2 avian influenza virus

Improved biosecurity is recommended for all poultry facilities



Identified Risks for HPAI Introduction

- The route of HPAI introduction is not known in most cases
- All potential sources of introduction must be mitigated
- The highest risks for HPAI virus introduction were:
 - Personnel who enter the poultry buildings
 - Shared equipment and shared crews
 - Procedures for disposal of dead birds
 - Manure management
- These elements should be the highest priority in allocating resources for improved biosecurity

Biosecurity to Control Introduction of Avian Influenza

To assist poultry producers in implementing effective biosecurity plans, USDA APHIS worked with State, academic, and industry experts to develop:

- Biosecurity checklist
- Biosecurity Officer Information Manual
- Training materials for employees (English and Spanish)

Available on the US Poultry and Egg Association website:

- http://www.uspoultry.org/animal_husbandry/intro.cfm

Improved biosecurity is recommended for routine standard operating procedures even in the absence of HPAI

Enhanced Biosecurity for Poultry Producers

The screenshot shows the USPOULTRY website with a blue header and a white main content area. The header includes the USPOULTRY logo and navigation links for HOME, ABOUT US, PEOPLE & GROUPS, PROGRAMS & EVENTS, PUBLICATIONS & RESOURCES, and EXPO. The main content area features a sidebar with a 'Home' button and a 'Biosecurity' section containing three images: an egg, a white chicken, and a blue chicken. The main content area has a title 'USDA Enhanced Biosecurity for Poultry Producers' with the USDA logo and text describing the program's purpose and providing links to a checklist and educational materials.

USPOULTRY
U.S. POULTRY & EGG ASSOCIATION

HOME ABOUT US PEOPLE & GROUPS PROGRAMS & EVENTS PUBLICATIONS & RESOURCES EXPO

Home
• USDA Enhanced Biosecurity for Poultry Producers
Biosecurity



USDA Enhanced Biosecurity for Poultry Producers

USDA United States Department of Agriculture

Highly pathogenic avian influenza (HPAI) affected over 200 poultry premises in the upper Midwest in spring 2015. The scope of the detections demonstrated that the biosecurity of poultry facilities needs to be strengthened to reduce the risk of future infections as much as possible.

To assist poultry producers in implementing effective biosecurity plans, the Animal and Plant Health Inspection Service (APHIS) worked with State, academic, and industry experts to develop this biosecurity checklist.

[Checklist for Self-Assessment of Enhanced Biosecurity](#)

Educational Materials

- [HPAI Biosecurity Officer Information and Training Materials](#)
- USPOULTRY [Biosecurity Page](#)

1530 Cooledge Road / Tucker, Georgia 30084-7303 / 770.493.9401 / Fax: 770.493.9257
©2015, U.S. Poultry & Egg Association. All rights reserved. [Privacy Policy](#)

http://www.uspoultry.org/animal_husbandry/intro.cfm

Poultry Biosecurity Training Materials

This site offers educational materials for the poultry industry to support implementation of biosecurity recommendations identified in the [Checklist for Self-Assessment of Enhanced Poultry Biosecurity](#). The materials are arranged by checklist item. The materials can be downloaded, printed and used as is. However, poultry Biosecurity Officers are encouraged to modify the resources to best meet the situation at their operations. Spanish-language versions of the handouts and PowerPoint presentations will be developed in the near future.

These HPAI Biosecurity Training Materials were produced by the [Center for Food Security and Public Health](#), Iowa State University, College of Veterinary Medicine. The USDA, APHIS, Veterinary Services, Surveillance, Preparedness and Response Services, [National Preparedness and Incident Coordination](#) provided funding through a cooperative agreement to the Center for Food Security and Public Health to develop these materials.

We welcome your [suggestions for improvement](#).

Biosecurity Officer

The first checklist recommendation is that "each production site (or integrated system) should have a Biosecurity Officer capable of designing and implementing effective biosecurity procedures". The Poultry Biosecurity Officer Information Manual provides guidance for a Biosecurity Officer in accomplishing the other checklist items.

 [Poultry Biosecurity Officer Information Manual](#) |  [Biosecurity Officer Manual – en español](#)

Training Employees and Other Personnel

Short video presentations are available for training purposes. The PowerPoint file for each presentation is also provided. The presentations can be downloaded and modified to better address specific factors at your production site.

Introduction

 [Video \(7 min.\)](#) |  [Presentation](#) |  [Video \(7 min.\) – en español](#) |  [Presentation – en español](#)

Do NOT Bring Avian Influenza to the Site

 [Video \(6 min.\)](#) |  [Presentation](#) |  [Video \(6 min.\) – en español](#) |  [Presentation – en español](#)

Perimeter Buffer Area

 [Video \(8 min.\)](#) |  [Presentation](#) |  [Video \(8 min.\) – en español](#) |  [Presentation – en español](#)

Line of Separation

 [Video \(6 min.\)](#) |  [Presentation](#) |  [Video \(6 min.\) – en español](#) |  [Presentation – en español](#)

The resources below are handouts and signs for training employees, service crews and visitors.

Line of Separation

Line of Separation

[!\[\]\(41034d0756eb325b49f9c2da00394e36_img.jpg\) DOCX](#) | [!\[\]\(d5ca301ee767f6f472f6a0d4319a97d7_img.jpg\) PDF](#) | [!\[\]\(47cb5c95454f06d0012d3b952ebc59bf_img.jpg\) DOCX – en español](#) | [!\[\]\(84aab842be600d8dcc8e259514088ee0_img.jpg\) PDF – en español](#)

Biosecure Entry Procedure

[!\[\]\(0e60d2d9b679b4cf53dbe1e685ee345d_img.jpg\) DOCX](#) | [!\[\]\(cd90fe00c7305acbce23b87dcbd69e39_img.jpg\) PDF](#) | [!\[\]\(de79f4dd4a07b1a5b68cd3a01bbae7d6_img.jpg\) DOCX – en español](#) | [!\[\]\(7eac61f3bf56556c8327e7278eff7c40_img.jpg\) PDF – en español](#)

Boot Baths – Footwear Disinfection

[!\[\]\(b0ba827d2a487ec829cbd8e604d56e0e_img.jpg\) DOCX](#) | [!\[\]\(a992687274647318f0230a378994f08c_img.jpg\) PDF](#) | [!\[\]\(33566fc2aa1d7da778584dd8b5deaeaa_img.jpg\) DOCX – en español](#) | [!\[\]\(f167de6a9db03e4035d534bdb2a96bad_img.jpg\) PDF – en español](#)

Signs:

[!\[\]\(c7143b06b3915be2311cf128bb2424aa_img.jpg\) Wear Protective Boots](#) | [!\[\]\(9d2200aad9739bdca5bf4eb470ef4f38_img.jpg\) Wear Protective Boots – en español](#)

[!\[\]\(eca9dca13a2688a2d5e75f35d4cc16aa_img.jpg\) Hose, Brush, Clean Boots](#) | [!\[\]\(16bf2976a2990817127baef7e213ac5d_img.jpg\) Hose, Brush, Clean Boots – en español](#)

[!\[\]\(6d4cdef06d803dcd63aa9aa8840a2ace_img.jpg\) Disinfect Clean Boots, No Rinse](#) | [!\[\]\(e499dbc6b4436d91339b28ab5d3ef762_img.jpg\) Disinfect Clean Boots, No Rinse – en español](#)

Perimeter Buffer Area

Perimeter Buffer Area

[!\[\]\(04abccf04933d76a5e2e7252f1218f84_img.jpg\) DOCX](#) | [!\[\]\(1bb02199b6d4e28e97a0d15335d6b0d1_img.jpg\) PDF](#) | [!\[\]\(1ea810ef329fff54c995256c4d2710e7_img.jpg\) DOCX – en español](#) | [!\[\]\(9e098b5028b0dddba1866ff88e2b0c4a_img.jpg\) PDF – en español](#)

Signs:

[!\[\]\(e4828b2df63fbf989497c9f8f63cc16d_img.jpg\) Wear Protective Boots](#) | [!\[\]\(32dcc546857da1df96569ebcc8c60c57_img.jpg\) Wear Protective Boots – en español](#)

Personnel

Do NOT Bring Disease to the Site

[!\[\]\(a68114a69291a883e0bcd1745b6c67b7_img.jpg\) DOCX](#) | [!\[\]\(67a08346df1487f0480c751e8acb0c6b_img.jpg\) PDF](#) | [!\[\]\(0819d93fd70810bd54b008d1527e52fa_img.jpg\) DOCX – en español](#) | [!\[\]\(d7f5779b72db3e14326e84fb83f4eb27_img.jpg\) PDF – en español](#)

Poultry Biosecurity Officer Information Manual

POULTRY BIOSECURITY OFFICER INFORMATION MANUAL

September 15, 2015



MANUAL DE INFORMACION PARA EL AGENTE DE BIOSEGURIDAD DE UN ESTABLECIMIENTO AVICOLA

15 de Septiembre del 2015



Biosecurity to Control Introduction of Avian Influenza

The biosecurity recommendations emphasize three concepts that may be new to existing biosecurity plans and should be strongly considered for implementation in all commercial operations:

- Biosecurity Officer
- Line of Separation for each building
- Perimeter Buffer Area

Biosecurity Self-Assessment Checklist

- *Biosecurity Officer*
- *Training of Employees and Other Personnel*
- *Line of Separation*
- *Perimeter Buffer Area*
- *Personnel*
- *Wild Birds, Rodents and Insects*
- *Equipment*
- *Dead Bird Disposal*
- *Manure and Litter Management*
- *Replacement Poultry*
- *Water Supplies*
- *Feed and Replacement Litter*

In place In progress Not In place

Biosecurity Self-Assessment Checklist

- APHIS urges producers to develop a site-specific plan to implement enhanced operational biosecurity as soon as feasible, preferably before Fall migration
- Effective biosecurity requires vigilance; producers should put a system in place to verify that biosecurity enhancements are being followed
- This checklist assumes that infections are limited to animals. Special precautions will be needed if the virus mutates to affect people.

Biosecurity Officer

- The Biosecurity Officer should be an experienced poultry veterinarian or should consult with one. He or she is responsible for developing a site-specific biosecurity plan and training all personnel who enter the farm
- The Biosecurity Officer should have the authority to ensure compliance with biosecurity protocols and take corrective action as needed. He or she continuously adapts the plan and procedures to address changing risks.

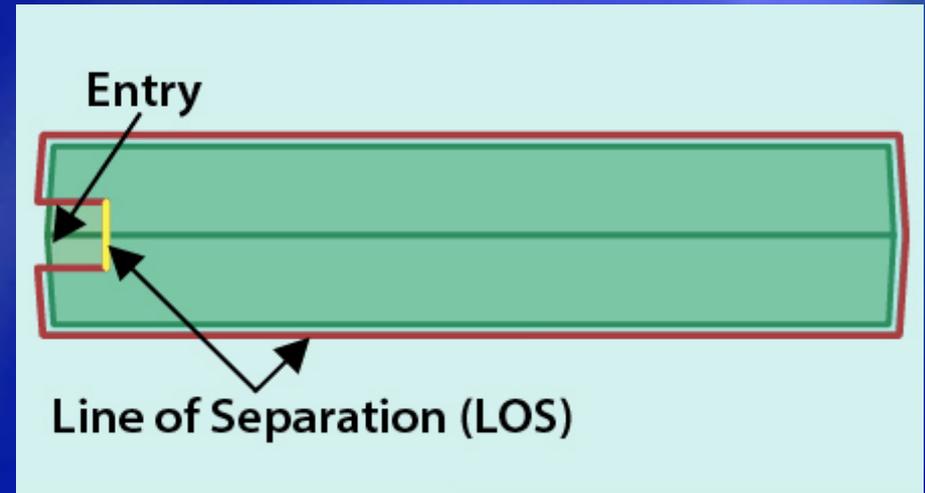
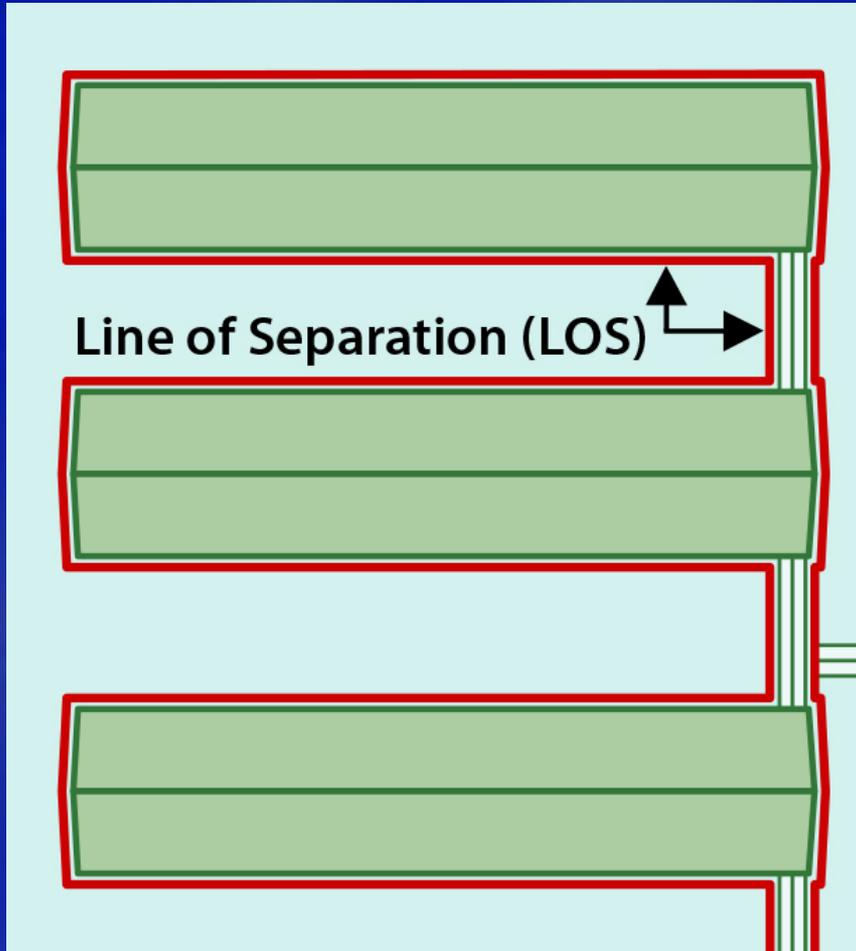
Training of Employees and Other Personnel

- The Biosecurity Officer ensures that farm employees, contract crews, truck drivers and service personnel are trained on site-specific biosecurity standard operating procedures
- Training materials are available on the US poultry website and can be customized to be site specific

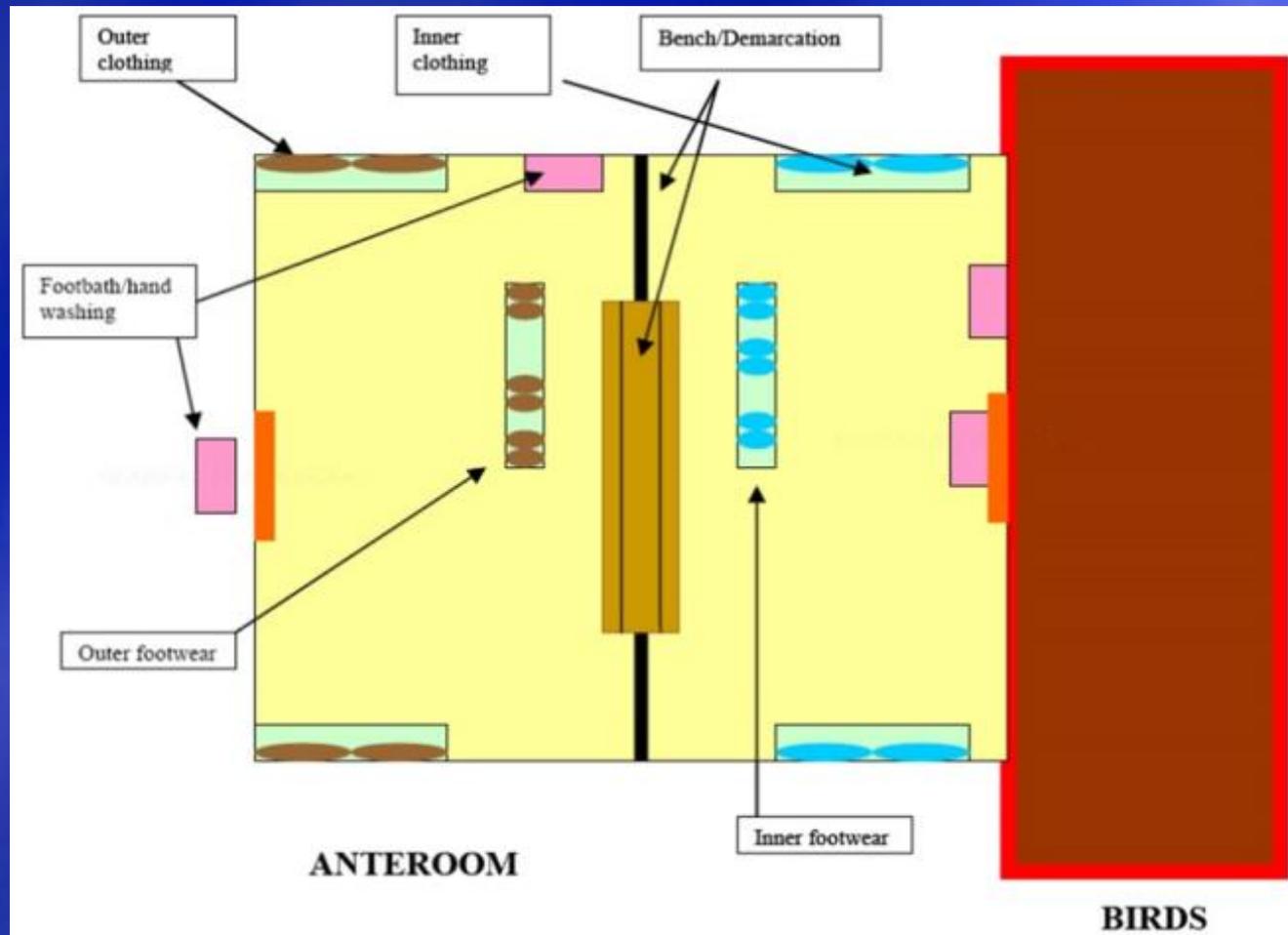
Line of Separation

- An essential component for improved biosecurity is to implement a Line of Separation for each building. The walls of the poultry house form the Line of Separation and should separate poultry from potential sources of HPAI virus.
- The Line of Separation is a critical control point for preventing HPAI virus exposure of poultry. A plan must address how this line will be defined and defended for each poultry house or set of connected houses.

Line of Separation (LOS)



Personnel Must use a Biosecure Entry Procedure to Cross the LOS



Personnel Must use a Biosecure Entry Procedure to Cross the LOS

- Personal items, such as cell phones, watches, and jewelry should not cross the LOS unless they can be disinfected



- All equipment and supplies that cross the LOS must be cleaned and disinfected, or be from a known clean source
- The same procedure will be followed in reverse when crossing back to the outside of the LOS

Examples of the “Danish Entry System”



Examples of the “Danish Entry System”



Perimeter Buffer Area

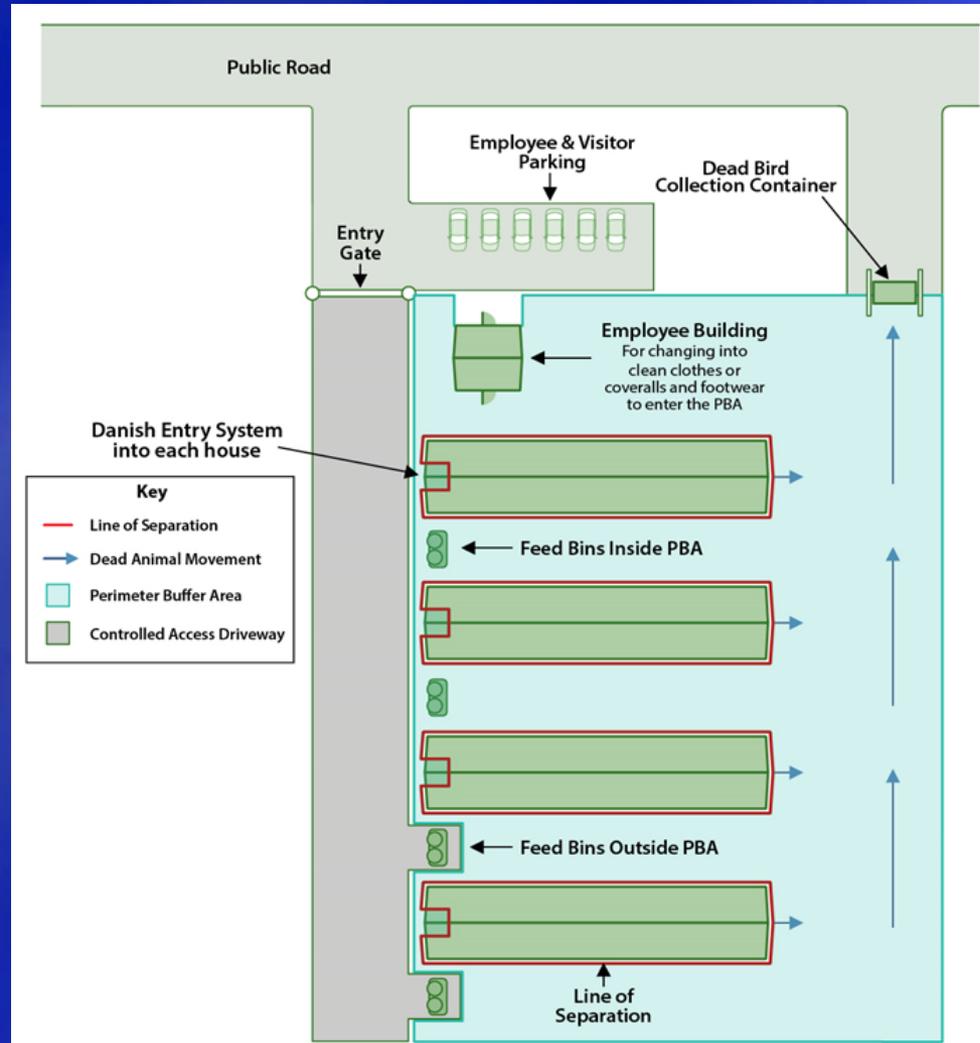
- The Perimeter Buffer Area concept is aimed at reducing virus entering and contaminating the production site
- Complete exclusion is not possible but reducing virus load in the outside environment will reduce risk

Perimeter Buffer Area (PBA)

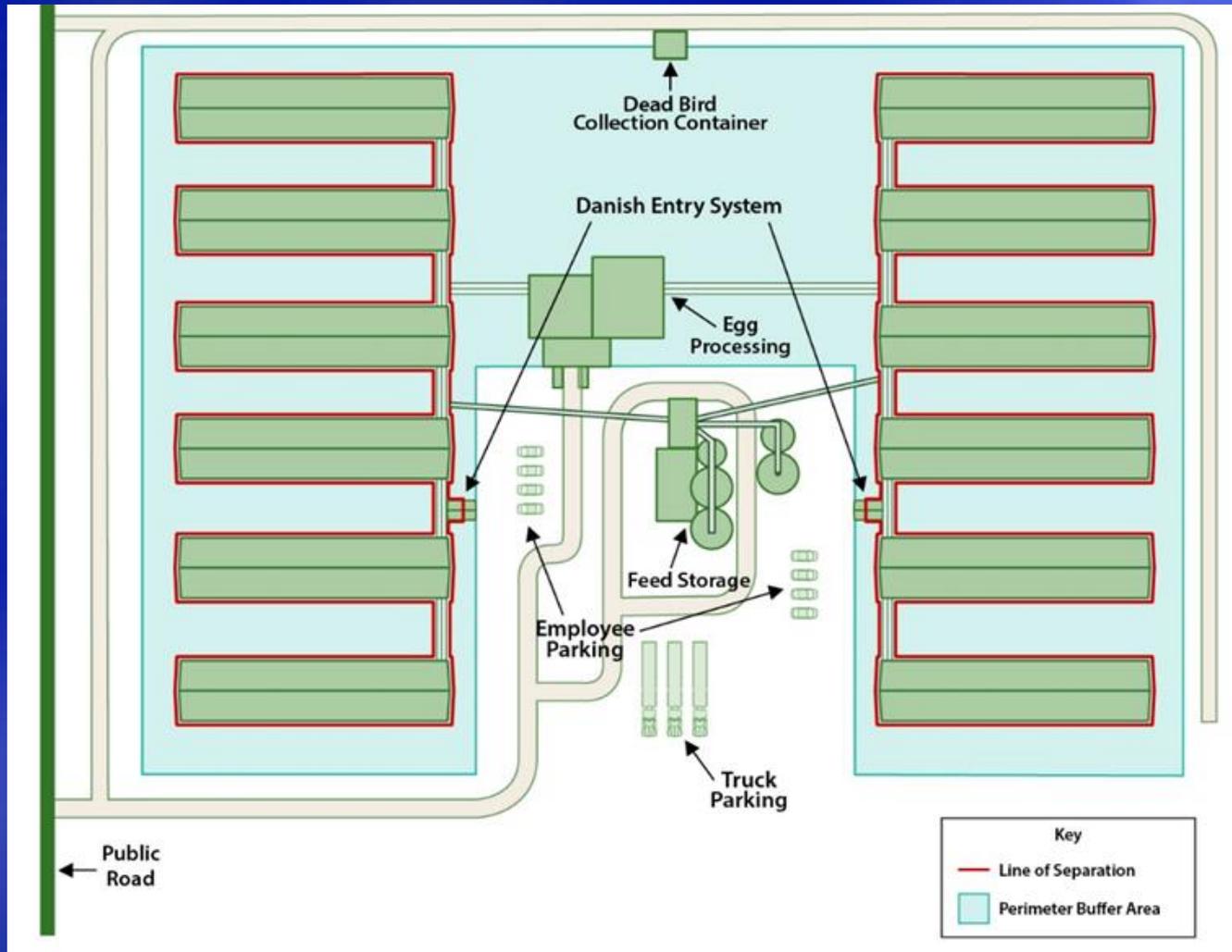
- The PBA is an outer control boundary set up around the poultry houses to keep vehicles, personnel and equipment which have not been cleaned and disinfected from contaminating areas near the poultry houses
- The PBA should be set up so that nonessential vehicles do not enter the PBA and therefore do not need to be cleaned and disinfected each time they arrive at the site



Perimeter Buffer Area (PBA)



Perimeter Buffer Area (PBA)



Minimize HPAI Introduction by Personnel

- Personnel and their clothing/footwear may become contaminated by AI virus through a variety of activities and contacts when they are off-site
- Showering and changing into clean clothes immediately prior to arriving at a poultry site, or upon arrival, will greatly reduce the risk of AI virus introduction
- Personnel should ensure that the inside of their vehicle is clean and has not become contaminated by soiled clothes or footwear
- This would apply to anyone who will enter the perimeter buffer area or cross the line of separation at a minimum

Wild Birds, Rodents and Insects

- Poultry operations should have control measures to protect poultry from wild birds, their feces and their feathers
- Rodent and insect control programs should be in place



Vehicles and Equipment that Cross the PBA

- Equipment should be effectively sanitized between uses
 - Thorough cleaning, application of an effective disinfectant, then allowing time for the disinfectant to kill the virus
 - OR
 - Heat the equipment for a time and temperature that will inactivate the virus; 56°C (133°F) for three hours has been recommended
-
- Sharing of equipment should be minimized

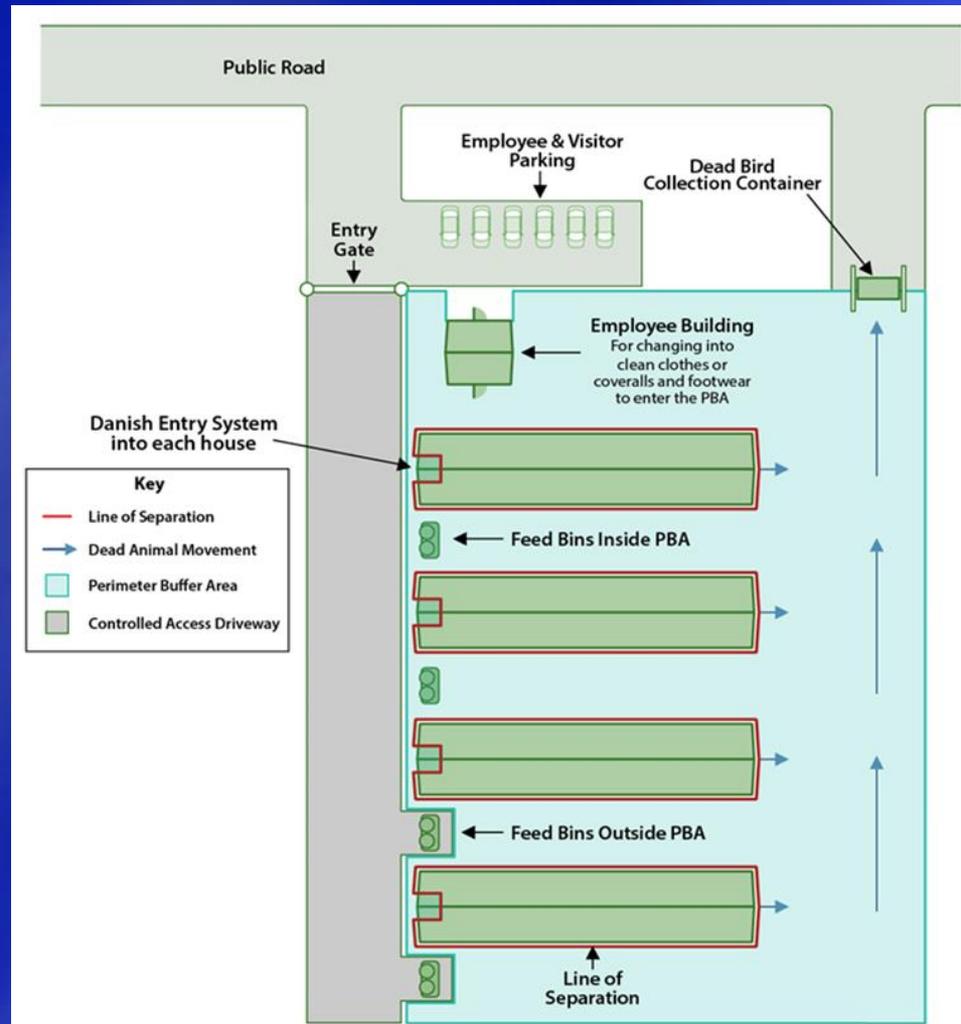


Dead Bird Disposal

- Dead birds should be disposed of in a manner that prevents the attraction of wild birds, rodents and other animals
- And avoids the potential for cross-contamination with dead birds from other facilities



Dead Bird Disposal



Manure and Litter Management

- Manure and spent litter should be removed in a manner to prevent exposure of susceptible poultry (either on or off the farm of origin) to disease agents
- Techniques for manure and litter management vary with the type of production system, physical characteristics of the site, and weather
- For these reasons, it is very important for the Biosecurity Officer to develop site specific SOPs for manure and litter management for each poultry facility

Replacement Poultry

- Replacement poultry should come from sources with documented biosecurity practices and a history of freedom from HPAI infection
- There should be recent HPAI surveillance testing on the source flock
- Replacement birds should be transported in vehicles cleaned and disinfected appropriately to minimize the risk of HPAI transmission from previously transported birds

Water Supplies

- Water should come from deep wells or sources that have been treated to eliminate any potential contamination with live virus
- If water comes from a surface water source, experts in water treatment should be consulted on how to continuously treat the water to eliminate viable virus

Feed and Replacement Litter

- Feed, feed ingredients and fresh litter can be contaminated if they have been exposed to wild waterfowl or other birds or if they contain insects or rodents that might be carrying the virus
- Grain, feed, and fresh litter should be stored and handled so that it cannot be contaminated with AI virus

Prospects for Control of HPAI

- State and Federal officials and producers are better prepared if the virus returns
- A collaborative approach emphasizing enhanced biosecurity, rapid detection, and rapid depopulation should keep an outbreak under control

Comments and Questions:
jaroth@iastate.edu 515-294-8459



The Gentle Doctor by Christian Petersen, 1938