Acknowledgments

The Avian Flu School International Program is a project of the Global Livestock CRSP

Avian Flu School was developed by the Wildlife Health Center and Cooperative Extension of the School of Veterinary Medicine at the University of California, Davis. Development of the Avian Flu School course curriculum was supported the Global Livestock CRSP and the National Center for Foreign Animal and Zoonotic Disease Defense.

This publication was made possible in part through support provided to the Global Livestock Collaborative Research Support Program by the Office of Agriculture, Bureau for Economic Growth, Agriculture and Trade, United States Agency for International Development under terms of Grant No. PCE-G-00-98-00036-00. The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the USAID.

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www.avianfluschool.org

Disclaimer

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Response Plans

Conclusion and Final Exercise
INTRODUCTION

<table>
<thead>
<tr>
<th>Instructor Notes</th>
<th>Course Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>In addition to this Course Guide, you will need the following for this module:</td>
<td></td>
</tr>
<tr>
<td>Avian Flu School Handouts</td>
<td></td>
</tr>
<tr>
<td>L  Chicken vaccination procedures</td>
<td></td>
</tr>
<tr>
<td>M  Euthanasia and disposal of infected birds</td>
<td></td>
</tr>
<tr>
<td>N  Disinfection checklist</td>
<td></td>
</tr>
<tr>
<td>O  Biosecurity visitor protocols</td>
<td></td>
</tr>
<tr>
<td>P  Sample biosecurity plan</td>
<td></td>
</tr>
<tr>
<td>This module includes the following training methods:</td>
<td></td>
</tr>
<tr>
<td>• Lecture</td>
<td></td>
</tr>
<tr>
<td>• Visuals</td>
<td></td>
</tr>
<tr>
<td>• Small and Large Group Discussion</td>
<td></td>
</tr>
<tr>
<td>• Exercises</td>
<td></td>
</tr>
<tr>
<td>Introduce this module by welcoming the participants to Module 4 of the Avian Flu School.</td>
<td></td>
</tr>
<tr>
<td>Introduce any new instructors for this module and ask each to briefly describe his or her relevant experience.</td>
<td></td>
</tr>
<tr>
<td>TARGET AUDIENCES</td>
<td></td>
</tr>
<tr>
<td>This module is designed for people in contact with poultry or other birds, including poultry producers, veterinarians, and zookeepers among others. In addition to broadening the understanding of viruses and transmission, audiences will take prevention, response and recovery planning capabilities back to their home flocks and communities.</td>
<td></td>
</tr>
</tbody>
</table>

MODULE PREVIEW

- The most effective ways to reduce transmission of H5N1 HPAI to humans is to reduce its occurrence in birds and reduce risky interactions between humans and birds.
- Because HPAI control methods are limited and often involve drastic measures, such as destroying infected flocks, prevention is the most effective defense against the disease.
- Public awareness and training campaigns can be successful in assisting in eradication efforts. After CARE Vietnam trained local animal health care workers, provided simple disinfection equipment, and developed and distributed educational pamphlets in two provinces in 2004, there were no further cases of H5N1 HPAI reported in those areas.
- Historically, over and under-responding to AI outbreaks has spread the disease even further. It is important that appropriate response plans be created before an incident occurs.
- Effective recovery measures help affected areas resume business as quickly as possible while minimizing the further spread of the disease.
<table>
<thead>
<tr>
<th><strong>TIMELINE</strong></th>
<th><strong>OBJECTIVES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A suggested time plan for this module is as follows:</strong></td>
<td>At the conclusion of this module, participants will be able to:</td>
</tr>
<tr>
<td><strong>Introduction and Module Overview:</strong> 15 minutes</td>
<td>• Define biosecurity and its three components</td>
</tr>
<tr>
<td><strong>Lesson 1:</strong> 35 minutes</td>
<td>• Describe basic biosecurity measures</td>
</tr>
<tr>
<td><strong>Lesson 2:</strong> 50 minutes</td>
<td>• Identify potential biosecurity risks</td>
</tr>
<tr>
<td><strong>Lesson 3:</strong> 65 minutes</td>
<td>• Explain why proper response is important</td>
</tr>
<tr>
<td><strong>Lesson 4:</strong> 140 minutes</td>
<td>• Describe basic response procedures</td>
</tr>
<tr>
<td><strong>Lesson 4 Exercises:</strong> 180 minutes</td>
<td>• Describe basic recovery options and benefits</td>
</tr>
<tr>
<td><strong>Total Time:</strong> 7.9 hrs</td>
<td>• Identify common intervention measures for different settings</td>
</tr>
<tr>
<td><strong>Briefly preview the lessons, covering the key points listed.</strong></td>
<td>• Prepare a biosecurity plan for a given setting</td>
</tr>
</tbody>
</table>

Instructor may add or omit material to customize length of module as necessary.

**Answer questions, then continue.**

---

*Wildlife Health Center and Cooperative Extension Global Livestock CRSP*  
*UC Davis School of Veterinary Medicine*  
*Module 4: Prevention and Response*
**LESSON 1**
**PREVENTION**

<table>
<thead>
<tr>
<th>Instructor Notes</th>
<th>Course Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>TIME: 35 MINUTES</td>
<td></td>
</tr>
</tbody>
</table>

**START TIME:** ________

**END:** ________

**TRANSITION**

As discussed in Module 1, with recent outbreaks responsible for the deaths of over 140 million birds and 220 people, it is vital that at-risk communities understand how they can prevent infection.

Briefly discuss each of the following biosecurity principles involved in controlling the spread of disease:

- **Isolation** of premises and poultry from sources of infection.
- **Controlling traffic** flow in and out of susceptible areas to limit exposure
- **Sanitation** of equipment and housing destroys disease agents.

**IMPORTANT POINT**

The most effective defense against the spread of Avian Flu is **PREVENTION**. Prevention is accomplished through **BIOSECURITY**.

**DEFINITION:**

**Biosecurity** refers to the implementation of policies and practices that prevent the introduction and spread of diseases.

- Isolation
- Controlling traffic
- Sanitation
Although specific biosecurity measures will vary depending on the needs of a site, there are some **basic biosecurity measures** common across settings, including:

- Wearing clean, protective clothing when working with flocks and storing it in the immediate work area
- Preventing domestic flocks from mixing with wild birds.
- Restricting the movement of animals, manure, eggs, equipment, and people between farms and markets
- Practicing basic hygiene such as hand-washing protects people as well as poultry from transmission of disease.

### EXERCISE 4-1
**IDENTIFYING BIOSECURITY INFRACTIONS**

Purpose: This exercise allows participants to apply knowledge of biosecurity to a real-world setting.

Instructions: Follow the steps below to conduct this exercise:

1. Ask participants to review the illustration of a Problem Farm on page 10.
2. Working individually, have participants circle or highlight biosecurity risks.
3. In the spaces below the graphic, have participants write in their directions for correcting the infractions.
4. When everyone is finished, go around the group asking individuals to share one of their answers.
5. For discussion, ask participants to name one or more risks to biosecurity that they have witnessed or know to be an issue for poultry producers or owners.

**Basic biosecurity measures**

- Dedicated clothing
- No mixing with wild birds
- Restrict movements between farms
- Basic hygiene
EXERCISE 4-1: IDENTIFYING BIOSECURITY INFRACTIONS

Purpose: This exercise allows participants to apply their knowledge of biosecurity principles to a “real-world” setting.

Instructions: Follow the steps below to complete this exercise.

1. Study the illustration of the farm on the next page.

2. Circle each biosecurity risk that you notice.

3. In the space below, write directions for correcting the infractions that you indicated on the graphic.

4. Be prepared to share your answers with the group.

HINT: There are at least 10 infractions pictured.

ADDITIONAL NOTES:
Lesson 1: Prevention
## LESSON 2
### RESPONSE

<table>
<thead>
<tr>
<th>Instructor Notes</th>
<th>Course Material</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TIME: 15 MINUTES</strong></td>
<td>Historically, over or under-responding to AI outbreaks has spread disease. If not properly implemented, the movement of crews, carcasses, manure, and contaminated vehicles can easily carry the disease from one contaminated location to create many more.</td>
</tr>
<tr>
<td><strong>START TIME:</strong>________</td>
<td><strong>END:</strong>________</td>
</tr>
</tbody>
</table>

**TRANSITION**

Although biosecurity measures will minimize the risk of transmitting disease, efforts may not prevent every case. Preparing in advance for appropriate responses to potential cases will help limit the spread and consequences of AI.

**IMPORTANT POINT**

Proper RESPONSE to an Avian Flu outbreak is required to keep from spreading the disease from one contaminated location to create many more.
It is important to understand **basic response measures** common across sites:

Be sure everyone involved in handling poultry **watches for signs of disease** among flock and/or unusual or suspect mortality.

**BASIC RESPONSE MEASURES:**

1) Watch

(See Table 1 below for symptoms of HPAI)

**DEFINITION:**

**Suspect mortality** refers to sudden and unexpected high mortality rates that cannot be explained by other causes.
Stop all movement of birds into/out of infected site.

Although only laboratory **diagnostic tests can confirm** whether the flock is infected with H5N1 HPAI, poultry handlers must immediately take steps as if the disease is present, to prevent spread.

- **Notify** local veterinary authorities who should conduct an outbreak investigation in the surrounding area and notify neighbors of incident
- **Diagnose** – finding out the specific cause for morbidity or mortality greatly improves the ability to conduct surveillance and justifies additional response measures, like depopulation.
- **Humanely euthanize (depopulate)** all birds on the farm if positively diagnosed with HPAI
- **Dispose** of carcasses (composting, burial, or burning) See Handout, “Disposal Procedures for Infected Poultry.”
- Thoroughly **clean and disinfect** premises and equipment that had contact with birds
- **Regional quarantines** by authorities should be used to determine the extent of the outbreak and prevent its further spread.

Depending on the audience, ask participants to identify how disease might be transmitted between flocks in their community and how many people and/or businesses might be affected by an improper response (for example: continued trading from a diseased flock).

<table>
<thead>
<tr>
<th>Instructor Notes</th>
<th>Course Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stop all movement of birds into/out of infected site.</td>
<td>2) Stop</td>
</tr>
<tr>
<td>Although only laboratory <strong>diagnostic tests can confirm</strong> whether the flock is</td>
<td>3) Notify</td>
</tr>
<tr>
<td>infected with H5N1 HPAI, poultry handlers must immediately take steps as if</td>
<td>4) Diagnose</td>
</tr>
<tr>
<td>the disease is present, to prevent spread.</td>
<td>5) Depopulate</td>
</tr>
<tr>
<td>• <strong>Notify</strong> local veterinary authorities who should conduct an outbreak</td>
<td>6) Dispose</td>
</tr>
<tr>
<td>investigation in the surrounding area and notify neighbors of incident</td>
<td>7) Clean</td>
</tr>
<tr>
<td>• <strong>Diagnose</strong> – finding out the specific cause for morbidity or mortality</td>
<td>8) Regional quarantines</td>
</tr>
<tr>
<td>greatly improves the ability to conduct surveillance and justifies additional</td>
<td></td>
</tr>
<tr>
<td>response measures, like depopulation.</td>
<td></td>
</tr>
<tr>
<td>• <strong>Humanely euthanize (depopulate)</strong> all birds on the farm if positively</td>
<td></td>
</tr>
<tr>
<td>diagnosed with HPAI</td>
<td></td>
</tr>
<tr>
<td>• <strong>Dispose</strong> of carcasses (composting, burial, or burning) See Handout, “Dis-</td>
<td></td>
</tr>
<tr>
<td>posal Procedures for Infected Poultry.”</td>
<td></td>
</tr>
<tr>
<td>• Thoroughly <strong>clean and disinfect</strong> premises and equipment that had contact</td>
<td></td>
</tr>
<tr>
<td>with birds</td>
<td></td>
</tr>
<tr>
<td>• <strong>Regional quarantines</strong> by authorities should be used to determine the</td>
<td></td>
</tr>
<tr>
<td>extent of the outbreak and prevent its further spread.</td>
<td></td>
</tr>
<tr>
<td>Depending on the audience, ask participants to identify how disease might be</td>
<td></td>
</tr>
<tr>
<td>transmitted between flocks in their community and how many people and/or</td>
<td></td>
</tr>
<tr>
<td>businesses might be affected by an improper response (for example: continued</td>
<td></td>
</tr>
<tr>
<td>trading from a diseased flock).</td>
<td></td>
</tr>
<tr>
<td>Global Livestock CRSP</td>
<td>Wildlife Health Center and Cooperative Extension</td>
</tr>
<tr>
<td>12 Module 4: Prevention and Resonse</td>
<td>UC Davis School of Veterinary Medicine</td>
</tr>
</tbody>
</table>
WHAT DOES AVIAN FLU LOOK LIKE?

TABLE 1 - AVIAN FLU SYMPTOMS

<table>
<thead>
<tr>
<th>Bird</th>
<th>Mortality</th>
<th>Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickens, turkeys, game birds</td>
<td>50%-100%</td>
<td>Hemorrhages under the skin, swollen heads, severe depression, no egg production, death</td>
</tr>
<tr>
<td>Ducks</td>
<td>0%-50%</td>
<td>Coughing, depression, swimming in circles, off feed, weight loss, cloudy eyes, twisted necks, death</td>
</tr>
<tr>
<td>Geese</td>
<td>0%-25%</td>
<td>Twisted necks, lack of coordination, unusual behavior, death</td>
</tr>
<tr>
<td>Pigeons</td>
<td>?</td>
<td>Normal appearance, diarrhea, decreased egg production, off feed</td>
</tr>
<tr>
<td>Ostriches</td>
<td>30%-60%</td>
<td>Anorexia, depression, nervous and enteric. Hemorrhagic enteritis, liver degradation</td>
</tr>
<tr>
<td>Instructor Notes</td>
<td>Course Material</td>
<td></td>
</tr>
<tr>
<td>------------------</td>
<td>----------------</td>
<td></td>
</tr>
</tbody>
</table>
| **EXERCISE 4-2: QUICK REVIEW**  
Purpose: This exercise helps participants commit key concepts to memory. | **EXERCISE 4-2: QUICK REVIEW**  
Purpose: This exercise helps participants commit important information to memory. |
| **Instructions:** Follow the steps below to conduct this exercise:  
 1. Working individually, have participants fill in the appropriate catch-words from memory next to the icon for each basic measure.  
 2. Working individually, have participants respond to the prompt in the participant guide, “How would you explain in your own words to someone in your community why it is important to follow the response guidelines?”  
Ask one or more volunteers to share their answers with the group. Reinforce/highlight participant answers that summarize well and may influence effectively. | **Instructions:** Follow the steps below to complete this exercise.  
 1. Write down eight key response measures.  
 2. How would you explain, in your own words, to someone in your community why it is important to follow the suggested response measures?  
 3. Be prepared to share your answers with the group. |
Basic recovery measures common across sites include:

- **Wait** – Verify a sufficient waiting period before restocking
- **Determine Infection source** – Determine how a flock became infected and correct any deficient biosecurity measures
- **Compensation** – Compensation for losses – provided by governments, communities, or co-ops – encourages participation and cooperation
- **Vaccination** – Consider vaccinating as an adjunct to biosecurity
- **Restore Confidence** – When an outbreak is over, it is important to communicate effectively with consumers and the public to restore their confidence.

Response activities can be costly to farmers and communities. Successful recovery from an outbreak focuses on preserving farms and businesses, protecting valuable birds and infrastructure, and resuming business as quickly as possible.
VACCINATING POULTRY

Background

° Vaccines protect against specific diseases by stimulating the host’s immune system
° AI vaccines protect against subtypes with the same HA (i.e. H5 vaccines will protect against H5 viruses, but not against H7 viruses)

Response in poultry

° Influenza vaccines do not create “sterilizing immunity” – a response so strong that birds will resist infection
° Birds that are vaccinated, are more resistant to infection than unvaccinated birds
° Vaccinated birds do not show clinical signs of disease and shed much less virus than unvaccinated birds

Strategies

° Protect valuable or irreplaceable birds or animals at risk of infection
° Protect high risk populations (like fighting cocks) from infection and thereby protect other compartments they may put at risk
° Vaccinating in a high risk zone
° Ring vaccination, i.e, vaccinating populations in close proximity to cases is one approach. However, it has not generally been effective for controlling avian influenza because the virus tends not to move from one farm to the one next door but rather through the movement of people and equipment.
° Vaccinating dangerous contacts i.e., protecting the populations epidemiologically linked to cases
° Diseased populations should always be depopulated, and not vaccinated

IMPORTANT POINT

Vaccination is an addition to biosecurity and NOT an alternative to proper biosecurity measures!
Monitoring of Vaccinated Flocks

Because vaccination can mask the signs of disease, monitoring for infections in vaccinated flocks should
be a part of any vaccination plan. It can be done with the placement of unvaccinated sentinel birds, mortality
monitoring, and/or using a Differentiation of Infected from Vaccinated Animals (DIVA) strategy. A
DIVA strategy is one in which a vaccine is used that does not completely “match” the subtype of the
challenge virus.

An example might be to use an H5N9 vaccine to protect birds from an H5N1 HPAI virus. In this case,
the flocks can be monitored for antibodies to N1. If they are found, then the flock has been infected.

Table 2. Differentiating Infection and Vaccination

<table>
<thead>
<tr>
<th>Vaccinated with:</th>
<th>Serologic tests will show:</th>
<th>Virologic tests will show:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virus Exposure?</td>
<td>AGID/ELISA</td>
<td>HI</td>
</tr>
<tr>
<td>None</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td>H5N1 (HP)</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>H7N2 (LP)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Homologous, killed (H5N1)</td>
<td>None</td>
<td>+</td>
</tr>
<tr>
<td>H5N1 (HP)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>H7N2 (LP)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Heterologous, killed (H5N9)</td>
<td>None</td>
<td>+</td>
</tr>
<tr>
<td>H5N1 (HP)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>H7N2 (LP)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Recombinant (FPV-H5)</td>
<td>None</td>
<td>-</td>
</tr>
<tr>
<td>H5N1 (HP)</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>H7N2 (LP)</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

1 Hemagglutination inhibition (HI) tests for the presence of antibodies to a specific HA protein, e.g., H5
2 Neuraminidase inhibition (NI) tests for the presence of antibodies to a specific NA protein, e.g., N1
3 Can be done with virus isolation, RT-PCR or antigen detection kits
4 Serotyping of the viruses, RT-PCR classification or sequencing
5 NA=not applicable
<table>
<thead>
<tr>
<th>Instructor Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXERCISE 4.3, VACCINATION: INSTRUCTIONS</td>
</tr>
<tr>
<td>See exercise on next page.</td>
</tr>
<tr>
<td>1. Each table is assigned a vaccination status from the following list.</td>
</tr>
<tr>
<td>a. H5N1 inactivated</td>
</tr>
<tr>
<td>b. H5N9 inactivated</td>
</tr>
<tr>
<td>c. FPV H5</td>
</tr>
<tr>
<td>d. Not vaccinated</td>
</tr>
</tbody>
</table>

Ask the participants to discuss the answers to the questions in the guide at their tables (5-10 min).

Ask the groups by table to say what their vaccination status is and ask them to explain how they would detect infection with H5N1 HPAI and/or H7N2 LPAI.

Ask if there are any questions about DIVA vaccination.
EXERCISE 4-3: DIFFERENTIATION OF INFECTED FROM VACCINATED ANIMALS (DIVA)

Purpose: This exercise allows participants to apply their knowledge of DIVA vaccination strategies in a “real-world” setting.

Instructions: Follow the steps below to complete this exercise.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>THE VACCINATION</td>
</tr>
<tr>
<td></td>
<td>At your table, you are a flock that has either been vaccinated or not. The type of vaccination is one of the following: inactivated homologous vaccine (H5N1), an inactivated heterologous vaccine (H5N9), recombinant vaccine (FPV-H5), or you have not been vaccinated.</td>
</tr>
<tr>
<td></td>
<td>Which vaccine did you receive? __________________</td>
</tr>
<tr>
<td>2</td>
<td>ANTIBODY RESPONSE</td>
</tr>
<tr>
<td></td>
<td>Answer the following questions in your groups:</td>
</tr>
<tr>
<td></td>
<td>° 1) Do you have AIV antibodies? __________________</td>
</tr>
<tr>
<td></td>
<td>° 2) Do you have H5 antibodies? __________________</td>
</tr>
<tr>
<td></td>
<td>(Hint: refer to preceding chart.)</td>
</tr>
<tr>
<td>3</td>
<td>At your table, select a system for monitoring for infection appropriate to your assigned vaccination status.</td>
</tr>
<tr>
<td>4</td>
<td>THE CHALLENGE</td>
</tr>
<tr>
<td></td>
<td>Discuss at your table the following questions after infection with H5N1 HPAI. What would your responses be if you were infected with H7N2 LPAI?</td>
</tr>
<tr>
<td></td>
<td>1. How would you know that you are infected?</td>
</tr>
<tr>
<td></td>
<td>2. What are the tests that should be run to determine your true status?</td>
</tr>
<tr>
<td>5</td>
<td>REVIEW</td>
</tr>
<tr>
<td></td>
<td>Participate with the larger group to answer questions about DIVA vaccination strategies.</td>
</tr>
</tbody>
</table>
## LESSON 4
### SCENARIOS

<table>
<thead>
<tr>
<th>Instructor Notes</th>
<th>Course Material</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TIME: 75 MINUTES</strong></td>
<td><strong>SMALLHOLDER POULTRY</strong></td>
</tr>
<tr>
<td><strong>START TIME:</strong> _______</td>
<td>Smallholder poultry operations include backyard or village flocks. Backyard or village poultry are often at risk of contracting diseases because basic biosecurity principles are not followed.</td>
</tr>
<tr>
<td><strong>END:</strong> _______</td>
<td><strong>IMPORTANT POINT</strong></td>
</tr>
<tr>
<td><strong>TRANSITION</strong></td>
<td>Implementing basic biosecurity measures greatly reduces the risk of HPAI infection</td>
</tr>
</tbody>
</table>

Although the basic principles apply to all settings, some types of settings will require additional or alternative measures for maximum protection. In this section, we will discuss up to 5 different settings and their special requirements. We will also finish this lesson by working in groups to create a biosecurity plan and response plan for the setting that most closely matches your area of expertise or experience.
Before discussing the measures for this setting, ask participants to identify measures they think will be unique or especially important for small poultry operations.

FOR SMALL POULTRY OPERATIONS, THE FOLLOWING PREVENTION MEASURES ARE IMPORTANT:

Isolation

- Avoid cockfights and other places where birds commingle and can easily spread disease
- Separate ducks from other poultry
- Keep flocks in roofed houses or fenced enclosures with netting, as in flight cages, to separate from wildlife
- Either replace or rest equipment like baskets, which can’t easily be disinfected.
- Add new birds only from trusted sources, avoiding auctions where the origin and health of the birds may be uncertain or where birds may become infected
- Keep new birds in a separate area for 2 weeks, visiting them after existing flocks and never in reverse
- Control pests that can spread disease
- Use only clean water for drinking and misting
Traffic Control

- Visitors – minimize casual visitors with a sign at the farm entrance and track all visits with a log (see sample visitor plan)
- People who handle birds, manure, eggs, or meat present the most risk to the home flock from other flocks.
- Minimize the number of people who have contact with poultry and enter the areas where poultry are kept.
- Parking should be off the farm and clearly marked or vehicles should be cleaned and disinfected before driving onto farm.

Sanitation

- Soap, water, and brushes should be supplied at farm to clean hands, shoes, vehicles.
- Vehicle disinfection is important, but it is more important to keep vehicles off the farm and away from flocks.
- Clean and disinfect facilities between flocks.
- Slaughtering of poultry should occur away from poultry flocks.
- Feathers, entrails, etc., from cleaned birds should be disposed of in an appropriate manner such as composting, burying, or burning.
## RESPONSE

- Be sure everyone involved in handling poultry watches for signs of disease among flock and/or unusual or suspect mortality.
- Stop movement of birds into/out of infected site. When a farm is experiencing a disease, apparently healthy birds should never be sold or given away. Even if they appear healthy, they may spread the disease to other poultry.
- Notify local veterinary authorities – who should conduct an outbreak investigation in the surrounding area and notify neighbors of incident.
- Diagnose – finding out the specific cause for morbidity or mortality greatly improves the ability to conduct surveillance and justifies additional response measures, like depopulation.
- Depopulate (humanely euthanize) all birds on the farm if positively diagnosed with HPAI
- Dispose of carcasses (composting, burial, or burning). See Handout M, “Euthanasia and Disposal of Infected Birds.”
- Thoroughly clean and disinfect premises and equipment that had contact with birds.

## Important response measures for small poultry operations:

1. Watch

2. STOP

3. Notify

4. Diagnose

5. Depopulate

6. Dispose (See Handout M, “Euthanasia and Disposal of Infected Birds.”)

7. Clean (See Handout N, USAID Disinfection Checklist)
### Instructor Notes

**RECOVERY**

- After the site has been thoroughly cleaned and disinfected, wait for a period of time required for virus to die before restocking to reduce the risk of infecting the replacement flocks.
- Consider **vaccinating** replacement flocks. 
  See: Handout L, “Chicken Vaccination Procedures”
- **Compensation** for losses – provided by governments, communities, or coops – encourages participation and cooperation, especially when owners may rely solely on the sale of their birds for their livelihood.

Ask participants which measures they feel will be the most difficult to implement on small poultry farms. What barriers might keep them from being implemented and what could be done to overcome those barriers?

### Course Material

**Important recovery measures:**

- Sufficient waiting

- Vaccinate replacements

- Compensation programs
Before discussing the measures for this setting, ask participants to identify measures they think will be unique or especially important in live bird markets.

### LIVE-BIRD MARKETS OR WET MARKETS

The mixing together of poultry from different sources makes wet markets excellent places for disease transmission and for virus amplification.

#### IMPORTANT POINT

Properly managing birds in the markets by implementing basic biosecurity measures reduces the chances that H5N1 HPAI will enter a market system, persist, and spread from the markets to outside flocks.

For **wet markets**, the following **prevention** measures are important:

**Isolation**

- Never return live birds to a flock after they have been at a market—even if they are only there a brief period. They can easily become infected and carry disease agents back to any flock they join.
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<thead>
<tr>
<th>Instructor Notes</th>
<th>Course Material</th>
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<tbody>
<tr>
<td></td>
<td>• Separate bird species; chickens, turkeys, pigeons, and gamebirds should be housed separately from ducks and geese</td>
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<tr>
<td></td>
<td>◦ at a minimum they should be kept in different cages</td>
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<tr>
<td></td>
<td>◦ waterfowl should not be placed above poultry cages</td>
</tr>
<tr>
<td></td>
<td>• Control pests and predators that may spread disease</td>
</tr>
<tr>
<td></td>
<td>• Either replace or rest equipment like baskets, which can’t easily be disinfected</td>
</tr>
</tbody>
</table>

**Traffic control**

- Supply markets from healthy flocks only; test to make sure they are not infected  
- Cages used for transport should not enter farms or the market when they are dirty  

**Sanitation**

- Clean and disinfect (or rest) transport cages before using at a farm again  
- Depopulate and clean & disinfect regularly to break the cycle of any disease agents circulating in the market
### Instructor Notes

- Dispose of birds that die in market; birds that die are not fit for consumption.
- Waste should be collected in covered waste bins and removed from the market daily.
- Slaughtering should be done in facilities that can be cleaned and disinfected.
- Vaccination of supply flocks may be helpful.

### Course Material

Ask participants to recommend additional measures that would be helpful in this setting.

**Response**

- Be sure everyone involved in handling poultry **watches for signs of disease** and/or unusual or suspect mortality.
- **Stop** all sales and movement of birds into/out of infected site. Notify all suppliers to stop their movements too.
- **Notify** local veterinary authorities if type or number of deaths is suspicious (over 5%) – who should conduct an outbreak investigation in the surrounding area and notify the community of incident (especially suppliers).
- Getting an accurate **diagnosis** is critical in determining how to respond and ultimately recover.
- **Dispose** sick or dead (composting, burial, or burning). See Handout M, “Euthanasia and Disposal of Infected Birds.”

**Important response measures for wet markets:**

1. **Watch**
   
2. **STOP**
   
3. **Notify**
   
4. **Diagnose**

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Wildlife Health Center and Cooperative Extension

UC Davis School of Veterinary Medicine

Global Livestock CRSP

Module 4: Prevention and Response  27
## Instructor Notes

- **Depopulate**: Slaughter or euthanize remaining live birds according to safe procedures
  - Workers should avoid other contact with other poultry to avoid spreading disease
- Thoroughly **clean and disinfect** premises

## Course Material

5. Depopulate

6. Dispose (See Handout M, “Euthanasia and Disposal of Infected Birds.”)

7. Clean (See Handout N, USAID Disinfection Checklist)

### Recovery

- After the site has been fully cleaned and disinfected, have the market inspected by someone knowledgeable about disease before restocking
- Verify a sufficient waiting period before repopulating (24 hours after inspection verifies thorough cleaning or several days if there is uncertainty about how well the market has been cleaned)
  - determining the source of infection is critical and may take additional time
  - repopulation without getting ride of the infection in supply flocks will result in immediate reinfection of the market.
- **Compensation** for losses – provided by governments, communities, or coops – encourages participation and cooperation
- Consider vaccinating supply flocks. See Handout L, “Chicken Vaccination Procedures”
- Accurate information about disease outbreaks can help to restore confidence

### Important recovery measures:

- Inspection
- Waiting
- Compensation programs
- Vaccinate supply flocks
- Restore confidence
Because there are multiple poultry diseases that can affect commercial flocks and cause economic hardship to producers, most commercial facilities have some biosecurity measures in place.

The potentially disastrous effects of an outbreak in a poultry facility make prevention an utmost concern and each farm should have a specific biosecurity plan which addresses isolation, traffic control, and sanitation (see Handout P, Sample Biosecurity Plan).

**IMPORTANT POINT**

Following a biosecurity plan greatly reduces the risk of HPAI infection.

For commercial poultry facilities, the following prevention measures are important:

**Isolation**

- Keep flocks separate from all other animals – especially wild birds
- Remove items that attract wild birds & pests (standing water, weeds, spilled feed, etc)
- Add new birds from tested and trusted sources only
- Control pests and predators that may spread disease
Traffic control

- Signs should be posted at farm entrance to stop casual visitors from entering the farm
- No visitors should enter poultry houses without prior arrangement with the farm manager.
- No visitors that have visited other chickens that day should be allowed (see Handout O for a sample visitor policy)
- Employees should not be shared between farms
- Farm workers should not keep poultry at home

DEFINITION

**Clean areas** are those where no or few disease-causing organisms are harbored. Even dirt-caked work clothing is considered clean if it has not been contaminated with potential disease agents. Clean functions include bird handling, egg pickup, and feed handling.

**Dirty areas** are those that are likely to be contaminated with disease-causing organisms. Dirty functions include manure pickup and dead bird handling.

- Separate “clean” and “dirty” areas and functions
  - No one should go from dirty to clean on the farm without a shower and a complete change of clothes. Usually it is easier to do clean functions first and...
leave clean shoes and clothes in the clean area.

- Vehicle traffic to and on the farm should be restricted and managed.

- Service and delivery trucks should only enter if necessary; drivers should check in and fill out a visitor log; should be parked on paved areas away from “clean” areas; and should keep windows closed to avoid flies.

- When entering and exiting the property, vehicles should have tires, wheel wells, and undercarriage sprayed with an approved disinfectant.

- Drivers should remain in their trucks if possible. If not, they should be kept away from the flocks. They should disinfect footwear before re-entering their trucks.

- In areas with many poultry farms, off-farm traffic should be separated into clean and dirty routes. Clean traffic includes uninfected cargo such as pullets, feed, chicks, poults, or clean supplies. Dirty traffic contains manure trucks, live haul, trucks, spent fowl, and rendering trucks.

- When multiple producers must share routes, coordination between them is critical. For example, the same route can be used for clean and dirty loads by all producers on certain dates or times of the day, provided dirty loads are sufficiently contained or separated by time, to prevent the spread of infectious material.

**Guidelines for moving birds**

- Test flocks two weeks prior to movement and do...
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<thead>
<tr>
<th>Instructor Notes</th>
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<tr>
<td></td>
<td>not move them if they are positive.</td>
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<tr>
<td></td>
<td>• Healthy birds can be moved in clean, disinfected trucks; if moved off the farm, use cages that will not return to the farm.</td>
</tr>
<tr>
<td></td>
<td>• Birds that have been infected with HPAI should not move except for disposal.</td>
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<td></td>
<td>• For meat bird farms, “all-in/all-out” production methods, in which all birds enter and exit the farm together, prevent newly-added birds from introducing disease into the facility, and allow for thorough sanitation and disinfection procedures between flocks.</td>
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<tr>
<td></td>
<td>• Older birds should not be brought in to fill in cages in an existing flock.</td>
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<td></td>
<td>• Never mix younger and older birds in a flock (cannibalism and disease will result).</td>
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</table>

Sanitation

- Showers, soap and water, and/or alcohol-based sanitizers should be available at farm for workers and visitors
- Workers should wear clean clothes to work then change into clean protective work clothing that remains at the farm at the end of the day
- Farm vehicles should be cleaned and disinfected regularly
- Between flocks a minimum of 2 weeks downtime is suggested for complete removal of bedding and feed and thorough cleaning and disinfection of facilities and equipment
Ask participants if there were any measures that they found surprising or they had not previously considered.

**Response**

- Be sure everyone involved in handling poultry **watches for signs of disease** among flock and/or unusual or suspect mortality
- **Stop** all movement of birds into/out of infected site. *Although only laboratory diagnostic tests can confirm whether the flock is infected with H5N1 HPAI, poultry handlers must immediately take steps as if the disease is present, to prevent spread.*
- **Notify** local veterinary authorities – who should conduct an outbreak investigation in the surrounding area and notify neighbors of incident
- Getting a specific **diagnosis** aids in outbreak surveillance and specific recovery activities like indemnification and vaccination.
- **Depopulate:** Humanely euthanize all birds on the farm if positively diagnosed with HPAI
- **Dispose** of carcasses and all infectious materials such as eggs and manure (composting, burial, or burning). See Handout M, “Euthanasia and Disposal of Infected Birds.”
- Thoroughly **clean** and disinfect premises and equipment that had contact with birds

Important **response** measures for commercial poultry facilities:

1. Watch
2. STOP
3. Notify
4. Diagnose
5. Depopulate
Instructor Notes | Course Material
---|---

6. Dispose (See Handout M, “Euthanasia and Disposal of Infected Birds.”)

7. Clean (See Handout N, USAID Disinfection Checklist)

**RECOVERY**

- **Wait for period** of time required for virus to die before restocking to reduce the risk of infecting the replacement flocks (at least 2 weeks)
- Consider **vaccinating** replacement flocks. Vaccination will reduce the chances that replacements will be infected either from virus still on the farm or circulating in the area.
- **Compensation** for losses – provided by governments, communities, or coops – encourages participation and cooperation
- Communication with consumers and trading partners to **restore confidence** is critical to the recovery of business.

Important **recovery** measures:

- Sufficient waiting
- Vaccinate replacements
- Compensation programs
- Restore Confidence

Ask participants which measures they feel will be the most difficult to implement in this setting. What barriers might keep them from being implemented and what could be done to overcome those barriers?
Before discussing the measures for this setting, ask participants to identify measures they think will be unique or especially important in zoos and aviaries.

ZOOES AND AVIARIES

Twenty-three Bengal tigers, one white tiger, and a clouded leopard in Thailand zoos died in 2004 from the H5N1 after eating carcasses of infected poultry; tiger-to-tiger transmission was observed in one case.

Although zoo managers may not think their facilities are at risk, if they use untested and raw poultry for food, receive animals without prior testing for exhibits or have exhibits that are open to wild birds, their animals may be at risk.

**IMPORTANT POINT**

Implementing basic biosecurity measures greatly reduces the risk of HPAI infection.
Ask participants if there were any measures that they found surprising or they had not previously considered.

For zoo and aviary collections, the following additional prevention measures are important:

**Isolation**

- Make sure meat used as food for zoo animals comes only from supply flocks or herds that have tested negative
- Add new animals only from trusted sources and test them prior to introductions
  - Wildlife trade, especially illegally traded wild birds, can spread the virus to new areas
- Keep collections separate from wildlife and each other

**Traffic Control**

- Map and separate clean and dirty routes and areas.
- Have employees wear protective clothing, and disinfect their shoes or boots in foot baths when entering or leaving each housing area.

**Sanitation**

- Disinfect items such as toys before placing in cages/enclosures
Instructor Notes  Course Material

**Response**

- Be sure zoo veterinarians, workers and volunteers know and watch for the **clinical signs** of AI in the various potential host animals in their care.
- **Stop** movement; secure the perimeter and stop internal movements (contain free-ranging animals).
- Getting an accurate **diagnosis** is critical in determining how to respond and ultimately recover.
- Humanely euthanize (depopulate) infected animals or work with authorities to determine options like vaccination or waiting. See Handout M, “Euthanasia and Disposal of Infected Birds.”
- **Dispose** of carcasses (composting, burial, or burning) See: Handout, “Disposal Procedures for Infected Poultry”
- Thoroughly clean and disinfect premises

**RESPONSE**

Important response measures for zoo and aviary collections:

1. Watch

2. STOP

3. Notify

4. Diagnose

5. Depopulate, vaccinate, or wait

6. Dispose (See Handout M, “Euthanasia and Disposal of Infected Birds.”)

7. Clean (See Handout N, USAID Disinfection Checklist)

**Recovery**

- **Wait** for period of time required for virus to die before restocking to reduce the risk of infecting the replacement animals.
- It is a good idea to use sentinel birds to ensure virus is gone before fully restocking

**Important recovery measures:**

- Waiting

- Use sentinels
### Instructor Notes

- **Consider vaccinating replacements**
  
  See Handout L, “Chicken Vaccination Procedures”

- **Restoring the confidence** of visitors and tourists after an outbreak is key in restoring income streams.

Ask participants which measures they feel will be the most difficult to implement in this setting. What barriers might keep them from being implemented and what could be done to overcome those barriers?

### ADDITIONAL NOTES:

<table>
<thead>
<tr>
<th>Instructor Notes</th>
<th>Course Material</th>
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<tbody>
<tr>
<td>- Vaccinate replacements</td>
<td>-</td>
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<tr>
<td>- Restore confidence</td>
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</table>
Instructor Notes

Explain each of the following measures intended to limit transmission from wildlife to nearby poultry and/or the reverse.

• People who have been in contact with wild birds (hunting) should not be in contact with poultry without cleaning and disinfecting vehicles and selves.

• Poultry keepers should adhere to biosecurity principles such as covering food & water and removing other attractants to keep wild birds away.

Ask participants if there were any measures that they found surprising or they had not previously considered.

Course Material

WILDLIFE

Unlike the other settings, there is no way to prevent AI infection in wildlife.

Since there is no feasible method for controlling the movement of wild migratory birds, the guiding principle of management of H5N1 HPAI in wildlife consists of preventing the spread of the virus from wildlife to poultry, people, and other animals.

IMPORTANT POINT

Preventing contact between domestic poultry and wild waterfowl helps protect all birds.

Limiting Transmission

• Limiting contact

• Biosecurity principles
### Instructor Notes

**Response**

1. Be sure everyone involved in managing wildlife areas watches for signs of disease among birds and/or unusual or suspect mortality.
2. Conduct surveillance for H5N1 HPAI if resources permit.
3. Dead birds found should be reported and treated as infectious.
4. Testing to confirm presence of disease.
5. Control movement of people and equipment into and out of areas with infected birds until an assessment is made.
6. Dead birds need to be properly disposed of. See Handout M, “Euthanasia and Disposal of Infected Birds.”
7. Notification of area authorities/farmers.
8. Some responses, like indiscriminately culling and eliminating habitat are ineffective response and may spread the disease further. Eliminating attractants for wild birds is more effective.

### Course Material

Culling indiscriminately and destroying habitat are ineffective responses and may spread the disease further.

**Important response measures for wildlife:**

1. Watch

2. Surveillance for H5N1 HPAI

3. Report dead birds

4. Test

5. Control movement

6. Dispose (See Handout M, “Euthanasia and Disposal of Infected Birds.”)

7. Notify
### Instructor Notes

#### Recovery
- Continued prevention through biosecurity measures in the area surrounding infection is important.
- Many wildlife areas rely on tourism for income and volunteers as a workforce and it is critical to communicate accurate information about disease status to restore confidence in visiting refuges after disease detection.

Ask participants which measures they feel will be the most difficult to implement in this setting. What barriers might keep them from being implemented and what could be done to overcome those barriers?

### Course Material

#### Important recovery measures
- Area biosecurity
- Restore confidence

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**ADDITIONAL NOTES:**
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<th>Instructor Notes</th>
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**Time:** 180 minutes

**Start Time:** ________

**End:** ________

**EXERCISE 4-4: BIOSECURITY PLANNING**

Purpose: This exercise allows participants to apply acquired knowledge to a real-world setting by creating a sample biosecurity plan.

Instructions: Follow the steps below to conduct this exercise:

1. Ask participants to break into groups of 4 or 5 according to their common background to complete plans.

2. Explain that they will be evaluating the biosecurity efforts of a specific farm, community, or region and creating a plan for improvements. Each person in the group will describe the setting with which they are most familiar to the rest of their group. Then the group will choose one setting to use for the remainder of the exercise. They should write that description on the blanks in the step 1.

3. Once the setting has been selected, the groups should refer to the prevention measures listed in the participant guide for that type of setting. In step 2, they will write in the measures that are currently observed in the specific setting and those that have not been implemented yet. Encourage groups to include measures that they currently think don’t apply since they may later think of ways that they are applicable.
### Instructor Notes

4. Next, the group should discuss each of the items in the column of items not yet implemented and choose the top 3 measures that should be addressed first. If items are very similar, it is acceptable for them to group them into a larger category.

5. Each group should consider the potential obstacles for each of the three measures they selected in the previous step. You may need to discuss an example with the large group if they are not able to think of them at first. For each obstacle that they list, they should also list as many options for overcoming the obstacle as possible. Encourage the groups to think of this as “brainstorming” so they should list all proposed options and worry about selecting the most feasible one in later steps.

6. To create their actual plan, each group should list the steps necessary for implementing the 3 measures they chose, including the most feasible solutions to the most likely 1 or 2 obstacles.

7. Be sure to check with groups as they work and answer any questions they have.

8. Finally, ask each group to share their plan, pointing out important points and measures that are different than other group’s answers.

<table>
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<tr>
<th>Instructor Notes</th>
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<tbody>
<tr>
<td>4. Next, the group should discuss each of the items in the column of items not yet implemented and choose the top 3 measures that should be addressed first. If items are very similar, it is acceptable for them to group them into a larger category.</td>
</tr>
<tr>
<td>5. Each group should consider the potential obstacles for each of the three measures they selected in the previous step. You may need to discuss an example with the large group if they are not able to think of them at first. For each obstacle that they list, they should also list as many options for overcoming the obstacle as possible. Encourage the groups to think of this as “brainstorming” so they should list all proposed options and worry about selecting the most feasible one in later steps.</td>
</tr>
<tr>
<td>6. To create their actual plan, each group should list the steps necessary for implementing the 3 measures they chose, including the most feasible solutions to the most likely 1 or 2 obstacles.</td>
</tr>
<tr>
<td>7. Be sure to check with groups as they work and answer any questions they have.</td>
</tr>
<tr>
<td>8. Finally, ask each group to share their plan, pointing out important points and measures that are different than other group’s answers.</td>
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</tbody>
</table>
### EXERCISE 4-4: BIOSECURITY PLANNING

Purpose: This exercise allows participants to apply acquired knowledge to a real-world setting by creating a biosecurity plan.

Instructions: Follow the steps below to complete this exercise.

<table>
<thead>
<tr>
<th></th>
<th>Describe</th>
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<tbody>
<tr>
<td></td>
<td>In this exercise, you will be evaluating the biosecurity efforts of a specific farm, community, or region and creating a plan for improvements. Have each person in the group describe the setting with which they are most familiar and then choose one to use for the remainder of the exercise.</td>
</tr>
<tr>
<td></td>
<td>Description of the setting your group will evaluate:</td>
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</table>
**EXERCISE 4-4: BIOSECURITY PLANNING (CONTINUED)**

2 **Evaluate**

Look at the prevention measures listed in your participant guide for your type of setting. In the columns below, indicate which measures are currently observed and which have not been implemented yet.

<table>
<thead>
<tr>
<th>Measures currently implemented</th>
<th>Measures not currently implemented</th>
</tr>
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<tbody>
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3 **Prioritize**

As a group, discuss the relative importance and impact of each of the measures not currently implemented. Identify the 3 measures your group feels should be addressed first:

1)  

2)  

3)  


<table>
<thead>
<tr>
<th></th>
<th>Analyze</th>
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<tbody>
<tr>
<td></td>
<td>Identify any likely or potential obstacles that might be faced when implementing the measures your group selected. Then, for each potential obstacle, identify options that would help overcome it.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Potential obstacles</th>
<th>Options for overcoming obstacles</th>
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<tbody>
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<thead>
<tr>
<th></th>
<th>Plan</th>
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<td></td>
<td>Describe, as thoroughly as possible, the steps necessary to implement your top 3 measures successfully.</td>
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<tr>
<td>1)</td>
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<td>2)</td>
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<td>3)</td>
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</table>
EXERCISE 4-4: BIOSECURITY PLANNING (CONTINUED)

6  Review and Revise

Note that in the “real-world,” you should review your biosecurity compliance often and evaluate how successfully you implemented new measures. Once new measures are in place, go through the steps again to identify additional areas for improvement.

7  Be prepared to share your answers with the group.

ADDITIONAL NOTES:
EXERCISE 4-5: RESPONSE PLANNING

**Purpose:** This exercise allows participants to apply acquired knowledge to a real-world setting by creating a sample response plan.

**Instructions:** Follow the steps below to conduct this exercise:

1. Explain that they will be evaluating the response measures feasible for the specific farm, community, or setting in the previous exercise and creating a plan for improving its response capabilities.

2. The groups should refer to the response measures listed in the participant guide for that type of setting. In step 2, they will write in the response measures that are currently feasible in the specific setting and those that require further preparation. Encourage groups to include measures that they currently think don't apply since they may later think of ways that they are applicable.

3. Next, the group should discuss each of the items in the column of items that require further preparation and choose the top 3 measures that should be addressed first. If items are very similar, it is acceptable for them to group them into a larger category.

4. Each group should consider the potential obstacles for each of the three measures they selected in the previous step. You may need to discuss an example with the large group if they are not able to think of them at first. For each obstacle that they list, they should also list as many options for over-
<table>
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<th>Instructor Notes</th>
<th>Course Material</th>
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<tr>
<td>coming the obstacle as possible. Encourage the groups to think of this as “brainstorming” so they should list all proposed options and worry about selecting the most feasible one in later steps.</td>
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<tr>
<td>5. To create their actual plan, each group should list the steps necessary to prepare for the 3 measures they chose, including the most feasible solutions to the most likely 1 or 2 obstacles.</td>
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<tr>
<td>6. Be sure to check with groups as they work and answer any questions they have.</td>
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<tr>
<td>7. Finally, ask each group to share their plan, pointing out important points and measures that are different than other group’s answers.</td>
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</table>
**Exercise 4-5: Response Planning**

**Purpose:** This exercise allows participants to apply acquired knowledge to a real-world setting by creating a response plan.

**Instructions:** Follow the steps below to complete this exercise.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
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<tbody>
<tr>
<td>1</td>
<td>In this exercise, you will be evaluating the response measures feasible for the specific farm, community, or region selected in the previous exercise and creating a plan for improving its response capabilities.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Evaluate</strong></td>
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<tr>
<td></td>
<td>Look at the response measures listed in your participant guide for your type of setting. In the columns below, indicate which measures your setting is currently equipped to handle and which will require further preparation.</td>
</tr>
</tbody>
</table>

| Responses currently feasible | Responses requiring preparation |
### EXERCISE 4-5: RESPONSE PLANNING (CONTINUED)

#### 3 Prioritize

As a group, discuss the relative importance, impact, and difficulty of each of the measures requiring further preparation. Identify the 3 measures your group feels should be addressed first:

1)  

2)  

3)  

#### 4 Analyze

Identify any likely or potential obstacles that might be faced when preparing for the measures your group selected. Then, for each potential obstacle, identify options that would help overcome it.

<table>
<thead>
<tr>
<th>Potential obstacles</th>
<th>Options for overcoming obstacles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
### EXERCISE 4-5: RESPONSE PLANNING (CONTINUED)

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td><strong>Plan</strong></td>
</tr>
<tr>
<td></td>
<td>Describe, as thoroughly as possible, the steps necessary to prepare for your top 3 response measures successfully.</td>
</tr>
<tr>
<td>1)</td>
<td></td>
</tr>
<tr>
<td>2)</td>
<td></td>
</tr>
<tr>
<td>3)</td>
<td></td>
</tr>
</tbody>
</table>

| **6** | **Review and Revise** |
|   | Note that in the “real-world,” you should review your response capabilities often. Once new capabilities have been added, go through the steps again to identify additional areas for improvement. |

| **7** | Be prepared to share your answers with the group. |
**Instructor Notes**

Large group discussion questions after all have shared:

- Which measures will make the most impact?
- Which may be the most difficult to implement?
- What did you find most difficult about completing this plan?
- What could be done to help those in your setting to make this type of plan and implement it successfully?

**ADDITIONAL NOTES:**
Review objectives and gather participants’ input about whether course objectives and individual expectations were met.

**TIME: 20 MINUTES**

**START TIME:**

**END:**

<table>
<thead>
<tr>
<th>Instructor Notes</th>
<th>Course Material</th>
</tr>
</thead>
</table>

**Review**

- The most effective way to reduce transmission of HPAI to humans is to reduce its occurrence in birds.
- Because HPAI control methods are limited and often involve drastic measures, such as destroying infected flocks, prevention measures are much more effective.
- Historically, over- and under-responding to AI outbreaks has spread the disease even further. It is important that appropriate response plans be created before an incident occurs.
- Effective recovery measures help effected areas resume business as quickly as possible while minimizing the further spread of the disease.

**Module Objectives**

Now that we’ve concluded this module, you should be able to:

- Define biosecurity and its three components
- Describe basic biosecurity measures
- Identify potential biosecurity risks
- Explain why proper response is important
- Describe basic response procedures
- Describe basic recovery options and benefits
- Identify common intervention measures for different settings
- Prepare a biosecurity plan for a given setting
- Prepare a response plan for a given setting
### Instructor Notes

Ask participants to identify one tip, tool, idea, strategy or resource they plan to use as a result of what they learned from this session.

Allow 2-3 minutes for individuals to record their planned action.

Next, ask participants to pair up with another group member and discuss planned actions. Allow 5-10 minutes for discussion. Invite participants to share examples of planned actions with the larger group, as time allows.

Encourage participants to preview materials for the next scheduled module prior to attendance.

Thank everyone for attending this session.

### Course Material

#### Ideas, Strategies and Resources:

- 
- 
- 

#### Planned Action

Identify one action you plan to take with regard to what you learned from this Module:

- 
- 
- 

By when:

With whom will you share your planned action?

- 
- 
- 

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Wildlife Health Center and Cooperative Extension
UC Davis School of Veterinary Medicine

Global Livestock CRSP
Module 4: Prevention and Response 55
REFERENCES AND RESOURCES


Cardona, C. (a.) The importance of good neighbor policies in poultry production. 2 pages.

______. (b) Recommendations to prevent the spread of and/or introduction of Avian Influenza virus. 5 pages.


______. 2005b. Enemy at the gate: Saving farms and people from bird flu.


