Poultry Biosecurity

Dr. Jim Watson
State Veterinarian
Mississippi Board of Animal Health
Infectious Disease Risk Management
Practical Biosecurity Resources for Commercial Poultry Producers

The Chain of Infection

Scientific Content:
Jean-Pierre Vaillancourt, DVM, MSc, PhD, Poultry Health Management Group, College of Veterinary Medicine, North Carolina State University
Michael Stringham, MSc, Department of Entomology, North Carolina State University

Funded by: The U.S. Poultry & Egg Association
Produced by: Paradigm Media
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The Chain of Infection

Organisms that are able to produce many contagious and damaging diseases in commercial poultry flocks.

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Physical media where disease organisms can grow and multiply, which includes organic material, birds, and pests among others.

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The Chain of Infection

A means for pathogens to leave their reservoir on their way to infecting birds.

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A vehicle for the disease to be transported from the reservoir to the flocks.

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The Chain of Infection

Pathogens need an entry point to get to susceptible hosts in your flocks.

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Birds are able to fight off many infections, but some birds that are not able to resist disease are susceptible hosts for pathogens.

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This video will give you an overview of Biosecurity issues and procedures. It is designed for both management and farm personnel.

Additional videos are available on Traffic Control, Pest Control, Cleaning & Disinfection, Susceptible Hosts, and Communication.
Look here to find more detailed information on sanitation, traffic control, pest control, and management issues. This will provide the foundation for your own, custom biosecurity program.

Also, use the interactive program generator to help custom design a program based on your type of operation and circumstances.
Enter here to learn what you should be looking for as you monitor the health of a flock. Also, this section contains in-depth information on disease risk, and the associated costs of poultry disease to the industry.
This will provide you with directions to a wide variety of biosecurity related resources, from hardware and chemicals, to signs, forms, and web links to assist producers with their biosecurity program.
This is mostly for poultry health professionals who need resources for their own work in the field.

It includes a biosecurity powerpoint presentation template, a library of bitmap images to use, and other resources.
Use this glossary to look up explanations for unfamiliar words and terms if you find them in the program.
The quizzes are designed to help you review the material in the program, and as a training tool for use by everyone in the company.
For each risk, you can identify biosecurity measures that would either be essential or at least help in reducing the risk. The relative importance of each risk and the value of each biosecurity measure is indicated using a scoring system:

- = Not a significant risk or valuable biosecurity measure
+ = minor risk or some value as a biosecurity measure
++ = Important risk or valuable biosecurity measure
+++ = Very important risk or essential biosecurity measure

<table>
<thead>
<tr>
<th>Risk</th>
<th>Importance</th>
<th>Biosecurity measure</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENVIRONMENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease present in the area</td>
<td>+++</td>
<td>Farm level: All aspects of biosecurity must be enhanced on a farm in an area currently affected by an important infectious disease. In particular traffic control and sanitation of vehicles and equipment brought on farm. Company level: intra- and inter-company communications are essential to monitor traffic (redirecting when appropriate) and strictly follow all biosecurity measures.</td>
<td>+++</td>
</tr>
</tbody>
</table>
## BIRDS AND OTHER ANIMALS

| Pets with access to the poultry barns | +++ | Farm level: Avoid. This must not be tolerated  
Company level: monitor situation | +++ |
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeding mortality to other animals (e.g., pets, pigs)</td>
<td>+++</td>
<td>Farm level: This is not an acceptable form of dead bird disposal. It must not be tolerated</td>
<td>+++</td>
</tr>
</tbody>
</table>
| Stray dogs present on the farm | ++ | Farm level: This must not be tolerated. County or city authorities responsible for stray animals should be called. Do not get in contact with such animals for biosecurity and safety reasons.  
Company level: Assist grower if needed | ++ |
| Non-poultry animals raised on poultry farm (swine, bovine, goats, etc.) | ++ | Farm level: Any livestock will bring a greater concentration of pests and some germs can affect more than one species. Although not as critical as other poultry, it does represent a risk. Make sure that separate employees care for these animals and/or that strict people, vehicle, and equipment sanitation procedures are followed. See the sanitation | +++ |
Interactive Biosecurity Risk Management Scenarios for Broilers

Please choose the type of production you would like to simulate:

- Broilers & Turkeys
- Breeders

What is the density of poultry operations, and presence of disease in the area surrounding the operation you are simulating?

- Low Density - No Disease in The Area
- High Density - No Disease in The Area
- Low Density - Disease Present in The Area
- High Density - Disease Present in The Area

Help

Exit Scenarios
Return to Main Menu

Continue
Premises

- Fence around poultry houses
- Gate at entrance of the farm
- Locks used to restrict access after hours for each poultry house
- Backyard flock within a 1/4 mile from the commercial farm
- Pile of material abandoned next to the poultry houses - and dense vegetation to the edge of these houses
- Presence of signs instructing unauthorized people to stay off the farm
- Use of electric wires close to the ground around houses for rodent control

Restart

Continue
Dead Birds

- Dead bird disposal done on farm (no outside service)
- Dead birds are removed at least three times a day.
Farm Environment

1. Restart

2. Red flag

3. Blue flag

4. Red flag

5. Red flag

6. Red flag

7. Red flag

Insert photo of a pile of debris and trash.
Farm Environment

- Pets (dogs and cats) present on the farm
- Rat and/or mice infestation
- Fly infestation
- Darkling beetles infestation
- Poultry house is wild bird proof
- Incoming vehicles are inspected for insects.
Sanitation

- Water chlorination
- Wheel bath available at entrance of the farm
- Clean footbaths used at the entrance of each poultry house
- Poultry houses washed and disinfected between flocks
- Equipment sanitized at the end of each day.

Restart
Equipment

- Vehicles cleaned before visiting the farm
- Equipment cleaned and disinfected before going on the farm
- Parking for cars at least 100 feet from poultry houses
- Cleaning station for vehicles at entrance of farm
Visitors and Employees

- People who have visited another poultry farm are allowed on farm on the same day.
- Face masks are used by all visitors.
- Catch crew has separate clothing for each farm.
- Head gear (cap) used by each person visiting the farm.
- Everyone uses gloves or washes their hands before and after handling birds.
- Everyone wears clean coveralls or "stay-on-farm-only" coveralls each day.
- Everyone wears clean boots each day.
- Farm employees also own birds.
- Farm employees and or grower visit other poultry places (including cock fights).
- Feed truck driver is not allowed in the poultry houses.

Restart

Continue
Management

- Downtime of at least 12 days
- Partial pickup
- All-in all-out production
- Disposal of used litter by the grower
- Implementation of a comprehensive pest control program
## Farm Evaluation

**Scale:** 0 - 550  
**Your Score:** 175

### Things you are doing right:

1. **People who have visited another poultry farm are allowed on farm on the same day.**  
   - Your Answer: No.
2. **Partial pickup**  
   - Your Answer: No.
3. **Backyard flock within a 1/4 mile from the commercial farm**  
   - Your Answer: No.
4. **Pets (dogs and cats) present on the farm**  
   - Your Answer: No.
5. **Rat and/or mice infestation**  
   - Your Answer: No.
6. **Fly infestation**  
   - Your Answer: No.
7. **Darkling beetles infestation**  
   - Your Answer: No.
8. **Pile of material abandoned next to the poultry houses - and dense vegetation to the edge of these houses**

### Needs correcting:

1. **Catch crew has separate clothing for each farm.**  
   - Your Answer: No.
2. **Head gear (cap) used by each person visiting the farm**  
   - Your Answer: No.
3. **Everyone uses gloves or washes their hands before and after handling birds.**  
   - Your Answer: No.
4. **Everyone wears clean overalls or “stay-on-farm-only” coveralls each day.**  
   - Your Answer: No.
5. **Everyone wears clean boots each day.**  
   - Your Answer: No.
6. **Downtime of at least 12 days**  
   - Your Answer: No.
7. **All-in all-out production**  
   - Your Answer: No.
8. **Disposal of used litter by the grower**  
   - Your Answer: No.
## FARM CHARACTERISTICS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Rating</th>
<th>Farm Level</th>
<th>Company Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free access to poultry barns</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Farm barns must be locked outside working hours. Signs should also clearly state that unauthorized people must keep out.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free access to the farm</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Farm level: At a minimum, signs should be posted to inform visitors to keep out unless authorized. Ideally, a gate should be installed and kept locked outside working hours. Company level: Provide signs to the farm. Assist producer by making sure that all service and company people close the gate after coming in and out.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Free range commercial poultry (house opening allowing birds to go to a fenced area)</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>Farm level: This should be rare. Avoid if possible. Such farms may not have as much flock density issues, but birds are more...</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## FLOCK CHARACTERISTICS

<table>
<thead>
<tr>
<th>Breeder flock health status unknown</th>
<th>+++</th>
<th>Farm level: Potentially increased risk of more susceptible birds or diseased birds. This is mainly a company issue. Company level: Good breeder flock monitoring is essential to avoid this problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flock composed of multiple breeder flocks of widely differing ages</td>
<td>+</td>
<td>Farm level: Higher likelihood of a lack of uniformity and variable immune status of the flock. Such flocks may be more susceptible to disease. Minimize stresses (adequate drinker and feeder spaces, density, ambient temperature, etc.) and insure good sanitation to reduce infection pressure. Company level: Avoid as much as possible</td>
</tr>
<tr>
<td>More than one hatchery used to populate a flock</td>
<td>+</td>
<td>Farm level: Potentially increased risk of more susceptible birds or diseased birds. This is mainly a company issue. Company level: Make sure that the breeder flocks of origin are</td>
</tr>
</tbody>
</table>
### BIRDS AND OTHER ANIMALS

<table>
<thead>
<tr>
<th>Description</th>
<th>Rating</th>
<th>Farm level:</th>
<th>Company level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pets with access to the poultry barns</td>
<td>+++</td>
<td>Avoid</td>
<td>monitor situation</td>
</tr>
<tr>
<td>Feeding mortality to other animals (e.g., pets, pigs)</td>
<td>+++</td>
<td>This is not an acceptable form of dead bird disposal. It must not be tolerated.</td>
<td></td>
</tr>
<tr>
<td>Stray dogs present on the farm</td>
<td>++</td>
<td>This must not be tolerated. County or city authorities responsible for stray animals should be called. Do not get in contact with such animals for biosecurity and safety reasons.</td>
<td></td>
</tr>
<tr>
<td>Non-poultry animals raised on poultry farm (swine, bovine, goats, etc.)</td>
<td>++</td>
<td>Any livestock will bring a greater concentration of pests and some germs can affect more than one species. Although not as critical as other poultry, it does represent a risk. Make sure that separate employees care for these animals and/or that strict people, vehicle, and equipment sanitation procedures are followed. See the sanitation plan.</td>
<td></td>
</tr>
</tbody>
</table>
## PESTS

<table>
<thead>
<tr>
<th>Issue</th>
<th>Risk</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| Darkling beetles infestation                                         | +++  | **Farm level:** Immediately request professional assistance (e.g., extension agent or specialized company) and review current beetle control practices. See the pest control section for details.  
**Company level:** Assist grower and monitor the situation.           |
| Rat and/or mice infestation                                          | +++  | **Farm level:** Immediately request professional assistance (e.g., extension agent or specialized company) and review current rodent control practices.  
Integrated pest management is necessary. See the pest control section for details.  
**Company level:** Assist grower                                    |
| Wild birds in poultry house while flock is resident                   | +++  | **Farm level:** Try to eliminate wild birds without inflicting stress on the flock (call professional service for assistance). Fix hole(s) that may have allowed wild birds to get in.  
**Company level:** Assist grower if needed. Monitor situation.        |
### PEOPLE

<table>
<thead>
<tr>
<th>Action</th>
<th>Risk Level</th>
<th>Farm level</th>
<th>Company level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grower or employee visits other poultry farms</td>
<td>+++</td>
<td>Avoid. If it occurred, follow strict sanitation procedures: shower, change clothing, and wear different footwear when returning to the farm. Employees must be reminded that this is not acceptable. If repeated incidents occur, this is cause for termination. Company level: Same as “farm level”</td>
<td>+++</td>
</tr>
<tr>
<td>People who have visited another poultry farm are allowed on farm on the same day</td>
<td>+++</td>
<td>Farm level: Best to avoid this situation with non essential visits. If needed, strictly enforce proper clothing and sanitation procedures (e.g., clean coveralls and boots, washing hands, keeping vehicle away from barns). NEVER allow a visit by anyone who has been on a diseased farm within the past 48 hours (exception would be service people visiting on the next day and who can show that the vehicle has been thoroughly washed and</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>+++</td>
<td></td>
</tr>
</tbody>
</table>
# HYGIENE

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Farm level</th>
<th>Company level</th>
</tr>
</thead>
<tbody>
<tr>
<td>No farm specific clothing for employees or visitors; no special clothing</td>
<td>This is one of the highest, and most documented, risk for a flock. It is</td>
<td>Same as “farm level”.</td>
</tr>
<tr>
<td>requirements</td>
<td>essential to have clean coveralls or farm specific clothing when working</td>
<td></td>
</tr>
<tr>
<td></td>
<td>or visiting a farm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Company level</strong>: Same as “farm level”.</td>
<td><strong>+++</strong></td>
</tr>
<tr>
<td>No special footwear requirements for employees or visitors</td>
<td><strong>+++</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Farm level</strong>: This is a very risky situation. Workers must have different</td>
<td></td>
</tr>
<tr>
<td></td>
<td>footwear for worker and after work. Visitors may use farm boots; if not</td>
<td></td>
</tr>
<tr>
<td></td>
<td>available, plastic boots may be used or rubber boots that have been</td>
<td></td>
</tr>
<tr>
<td></td>
<td>thoroughly washed and disinfected. Plastic boots are only adequate for</td>
<td></td>
</tr>
<tr>
<td></td>
<td>short visits.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Company level</strong>: Same as “farm level”.</td>
<td><strong>+++</strong></td>
</tr>
<tr>
<td>Catch crew keeps same clothing when going between two farms</td>
<td><strong>+++</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Farm level</strong>: Although less of a concern for all-in all-out farms, this</td>
<td></td>
</tr>
<tr>
<td></td>
<td>practice is risky.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It can be minimize by making sure that live-</td>
<td><strong>+++</strong></td>
</tr>
</tbody>
</table>
Biosecurity Quiz
Test Your Knowledge

Select the type of question set you would like:

- Broilers
- Layers
- Hatchery
- Breeders
- Turkeys

To change the number of questions on the quiz, enter a new value: 30

Show correct answer feedback during the quiz
What would be considered an adequate downtime between flocks under normal field conditions?

- 1 Week
- 2 Weeks
- 3 Weeks
- 4 Weeks

Why is a regional perspective important relative to biosecurity in major poultry areas?

- Because companies are usually present in specific regions.
- Because the high density of farms in one area increases the risk of disease transmission.
- Because of state regulations.
- Because more than one poultry company are often present.

All the following are major components of farm level biosecurity except:

- Restricting access to the farm - especially for other poultry people.
- Lock buildings after working hours.
- Having no more than 2 separate entrances to the farm.
- Having a set biosecurity protocol in place for visitors.
Biosecurity Quiz
Test Your Knowledge

At which pH are all disinfectants active?

- Less than 3
- 3 to 5.9
- 6 to 7.9
- 8 to 10

What is a clean area in the context of a biosecurity program?

- Area that has just been cleaned
- Area where no contaminated material can go
- Area without anything in it
- Area where only employees can go

What likely represents the highest risk?

- Dogs allowed around poultry barns
- Backyard flock located near a poultry farm
- Backyard flock owner visiting a poultry farm
- Pond located on or near the farm
### Footbaths are not useful when:

- The disinfectant solution is not changed frequently
- Users have dirty boots
- The disinfectant does not work well in the presence of organic material
- All of the above

### What should be done by the grower if sudden high mortality occurs in a flock?

- Call service person and increase biosecurity immediately
- Try to solve the problem and call service person if the cause is not found
- Treat with antibiotics in the water to see if flock responds to treatment
- Call a service person

### What is the most important reason why it is recommended to let barns dry after washing and after disinfection?

- Wet conditions are hazardous to workers
- Dryness helps kill germs
- It is difficult to deal with humidity once birds are in the barn
- It is easier to install equipment under dry conditions
Biosecurity Quiz
Test Your Knowledge

It is best for farm employees and visitors to park their vehicle

- As close as possible to the poultry house(s)
- As close as possible to the medication or service shed
- Anywhere within the farm
- At least 100 feet from the poultry houses

F ✗ T ✓ Visitors should be required to follow the same sanitary protocol as the employees

Visitors who never were in contact with birds prior to the visit represent a reduced risk. What else is true about them?

- There is no need for them to wear all the biosecurity gears
- That’s good - but they should be treated like all other visitors. Consistency of application of rules is key
- They should be able to park anywhere on the farm
- They may visit more than one farm on the same day
Questions?
Restart