



Backyard Poultry Biosecurity

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Abstract

Biosecurity is taking measures to protect animals and humans from harmful biological agents. In commercial poultry production, this generally means total confinement operations with strict rules to maintain flock health such as shower-in and out systems, special clothing, and other measures. In small production or “backyard” poultry operations these measures aren’t always a reality. However, there are steps that should be taken to help promote biosecurity and safety for backyard flocks.

Why is biosecurity important?

There are many diseases that can have an adverse effect on a flock, but by practicing some simple measures to promote biosecurity, producers can save a lot of money, time, and effort. In 2014-2015 an Avian Influenza epidemic struck the Midwest. The USDA reported that nearly 7.8 million turkeys and approximately 37.5 million egg-laying hens were euthanized to prevent the spread of the disease. This led to a large increase in the price of eggs and had an economy-wide impact estimated at over \$3.3 billion (Greene, 2015). The impact that disease can have on a flock can be devastating for both large and small scale operations. Biosecurity is a method that can help to promote the health of poultry.

What are we protecting from?

Listed below are some common diseases poultry flocks may encounter, risks associated with them, how they are transmitted, treatment of the disease, and ways to prevent the onset or spread of disease.

Type	Disease	Risks	Transmission	Treatment	Prevention
Viral Diseases	Avian Influenza	Range from mild to severe, severe disease usually results in 100% mortality	Released in nasal secretions and feces of infected birds; often comes from wild birds; can survive a long time in cool, moist environments	No treatment, infected birds and all birds in the same enclosure are euthanized to prevent spread of disease	Strict biosecurity, avoid contact with wild birds and waterfowl
	Bronchitis	Nasal or eye discharge, drop in egg production, respiratory problems, death	Nasal secretions and feces of infected birds, highly contagious	No treatment	Biosecurity, vaccination

Viral Diseases	Hemorrhagic Enteritis (Turkeys Only)	Depression, bloody droppings, death	Bird-to-bird through contaminated litter*	No treatment	Biosecurity, sanitation, vaccination
	Marek's Disease	Induces neoplasia (cancer) and can lead to 100% mortality in 10 weeks in infected chickens (longer for turkeys)	Virus can spread in feather dander; dust, feces, and saliva, infected birds carry virus in their blood for life and are a source of infection	No treatment	Vaccination at hatchery, cleanliness, biosecurity
	Exotic Newcastle Disease	High mortality, respiratory and nervous system issues, swollen heads	Nasal secretions and feces of infected birds	No treatment	Biosecurity, vaccination can prevent infection of mild strains
Bacterial Diseases	Fowl Cholera	Mortality	Bird-to-bird contact or contact with rodents (squirrels, rats, mice, etc.) or other wild animals	Sulfonamides and antibiotics	Biosecurity; keep rodents, wild birds, and pets away from flock
	E. Coli	Sick bird syndrome, mortality, lameness, respiratory issues	Contaminated environment (air, water, feed, or litter*)	Antibiotics	Cleaning, control existing infection
	Salmonella	Mortality in chicks and poults, loss of appetite, diarrhea, drop in egg production	From infected hen to chick through the egg, or from bird-to-bird through fecal-oral ingestion	Antibiotics	Control rodents (rats and mice can be carriers), maintain a clean enclosure to limit fecal-oral ingestion
Parasitic Diseases	Blackhead	Sick bird syndrome, yellow-colored droppings, mortality	Chicken cecal worms, earthworms, or directly from the soil	Medicated feed	Control cecal worms and earthworms, keep chickens and turkeys separated, use medicated feed containing Histostat
	Worms (Round, tape, cecal, capillary, gape)	Unthrifty birds, gasping (gapeworms)	Fecal-oral ingestion	Poultry dewormers	Sanitation, remove litter regularly, watch for worms in feces

❖ (Christensen, 2013), (Dunn, 2013), (Frame, 2010), (Helm, 2004), (Nolan, 2013), and (Savage and Darre, 2010)

* Litter is a mixture of spilled feed, poultry manure, and bedding material (Espinoza, Slaton, and Daniels, 2005).

What can producers do to make promote biosecurity?

The following six basic suggestions for keeping backyard flocks safe are adapted from the United States Department of Agriculture's recommendations for biosecurity.

1. Give them space.

- Restrict access to property and flocks. One must assume that the area around poultry and their enclosures could contain disease even if birds appear to be healthy.
- Try to limit the number of people that poultry come in contact with, especially if visitors to the property have birds of their own. Have visitors sanitize their hands and clean their shoes, or provide them with clean shoes or shoe covers (i.e., plastic bags) to wear, before visiting pens
- Wild birds and migratory waterfowl can carry disease and should not have contact with a flock. If poultry are outdoors, try to keep them in a screened area (see Figure 1) where wild fowl will not have contact with them.
- Keep poultry safe from predators by ensuring they are properly enclosed. Consider closing the facility at night or taking further measures to protect from predators.
- Make sure poultry are securely fenced in. Bury fencing several inches deep around the edges to ensure that predators don't get in and chickens don't get out. Have a shelter with enough room. Six square feet per bird is recommended for turkeys (Danko, 2001), three square feet is recommended for layer hens, and two to three square feet is recommended for meat or dual purpose chickens (FAO). Ensure that housing facilities have adequate ventilation.



Figure 1: An example of a screened chicken enclosure
Photo Credit: Micah Rain

2. Keep it clean.

- Cleanliness is crucial to establishing biosecurity. Viral, bacterial, and parasitic diseases can live weeks or even months in unsanitary environments. It is very important to keep feed, water, and bedding clean.
- Poultry frequently ingest feces. Poultry are often consuming things off of the ground and as a result can end up ingesting harmful viruses, bacteria, or parasites that may have come from an infected bird. Because of this, it is important to clean feeders and waterers often, preferably daily. It is also important to clean out bedding from the pen and coop frequently. The frequency of bedding changes varies with the type, number, and size of poultry present. (Use your judgment to know when to replace bedding. If the bedding has wet spots, remove the wet bedding and replace it with fresh dry bedding. Change out all bedding regularly.) If bedding smells bad, is damp, or just looks dirty, change it for fresh bedding.
- Clean pens between batches of chickens or when placing other varieties of poultry into enclosures. This can greatly reduce the chance of disease. For example: Marek's disease, a disease that is common worldwide, can survive for months in bedding or feathers that have come in contact with infected birds (Dunn, 2013). Other diseases can also survive long periods of time, such as the Avian Influenza virus which can survive months in cool, damp environments (Helm, 2004). Regular cleaning can help prevent the spread of diseases.
- See **Cleaning and Disinfecting** on page 5 for more tips on effectively cleaning.
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3. Don't haul disease home.

- Vehicles, clothing, cages, and other equipment can all carry disease. If a person travels to a location where other birds may be present, they must be sure to clean any items that could come in contact with their flock.
- Shoes can be a major source of disease. Always wash shoes before coming in contact with poultry (try using a footbath—see page 7). Perhaps consider having a special set of shoes for use when taking care of poultry.
- Hands, like feet, can be a source of disease. Be sure to sanitize your hands after cleaning your shoes by using a hand sanitizer or hand wipes.
- In 4-H, birds may be going to a show or exhibition. Any time poultry is transported and then brought home, they should be quarantined from the rest of the flock and watched for at least two weeks to make sure they haven't picked up any new diseases. If new birds are going to be added to the flock they should be isolated from the existing flock for at least 30 days before being put in with the existing flock.
- It is best not to mix older and younger birds. This can lead to younger birds being attacked by older birds. Younger birds can also be more susceptible to disease carried by older birds.
- Mixing species can also be harmful to flock health due to diseases that can be transferred between species. For instance, turkeys can get blackhead from chicken cecal worms.
- See **Cleaning and Disinfecting** on page 5 for more tips on effectively cleaning to prevent bringing disease home.



*Figure 2: Newcastle Disease in a broiler chick—Twisted Head and Neck (infonet-biovision)

4. Don't borrow disease from neighbors.

- People who come to visit may not be aware of biosecurity measures and may not even know what biosecurity is. Help them to know the proper way to interact with poultry. Make sure they clean and disinfect their shoes, clothes, and hands before and after interaction with the poultry.
- Do not share birds, equipment (such as cages and feeders), tools, or supplies. Diseases can easily be spread by sharing. If items must be shared, make sure the item is properly cleaned and disinfected *before* it reaches another property. When returning borrowed items, clean and disinfect the items before taking them back to the owner.
- Never share items that are porous and cannot be properly cleaned such as wooden pallets and cardboard egg cartons.

5. Know the warning signs of infectious bird diseases.

It is important to know when there may be something wrong with a bird in a flock. Many avian diseases can be hard to diagnose. Listed below are general symptoms to look for when managing a flock as given by the USDA:

- Sudden increase in bird deaths
- Sneezing, gasping for air, coughing, and nasal discharge
- Watery and green diarrhea
- Lack of energy and poor appetite
- Drop in egg production or soft-shelled, thin-shelled, or misshapen eggs
- Swelling around the eyes, neck, and head
- Purple discoloration of the wattles, comb, and legs (Avian Influenza)

- Tremors, drooping wings, circling, twisting of the head and neck (see Figure 2)*

If any of these symptoms are noticed, contact a veterinarian or extension specialist.

6. Report sick birds.

Don't wait to report signs of disease or unexpected deaths in a flock. Call your local Extension office or agent, local veterinarian, state veterinarian, or the USDA Veterinary Services office. The USDA operates

Backyard chickens

a toll-free hotline with veterinarians to help free of charge.

The number for their service is 1-866-536-7593.



If a bird in a flock gets sick, immediately quarantine the sick bird (place the sick bird as far away from the rest of the flock as possible) until you can properly identify what is ailing the bird.

Cleaning and Disinfecting

In Utah 4-H, we have two poultry programs: the Broiler Program and the Turkey Program. Many youth participate in both of these programs. If the same enclosure or housing is being used for different species it is important that it is cleaned well between the different types of birds.

Steps for Cleaning

1. Thoroughly clean and scrub objects before applying disinfectant. Disinfectants are not effective if they are applied over caked on dirt, manure, or bedding.
2. Apply disinfectants using brushes, sponges, or spray units. Allow adequate contact time.
3. Dispose of used disinfectant properly.

Common Disinfectants

- Roccal: Mix ½ fluid ounce per gallon of water
- Nolvasan (chlorhexidine diacetate 2%): Mix 3 fluid ounces per gallon of water
- Household bleach (sodium hypochlorite 6%): Mix ¾ cup per gallon of water
- Disinfectant spray (i.e., Lysol) for footwear
- Hand Sanitizer (i.e., Purell) for hand disinfection

How to Make a Simple Footbath

What you will need

- A low plastic pan or bin that is wide enough to fit an adult's foot and shallow enough that it can be stepped into easily
- A plastic doormat (the "fake grass" mats that can be purchased at home improvement stores work well)
- A disinfectant that works well for most situations, such as Tek-trol or One Stroke Environ
- Water

Steps

1. Cut the mat to fit inside of the pan or bin.
2. Place the mat into the bottom of the bin (see Figure 3).
3. Mix the disinfectant with the appropriate amount of water.

4. Pour enough disinfectant into the bin that the bottom of the mat is wet, but not enough disinfectant that peoples' feet will get wet (see Figure 4).
5. Ask any visitors to walk through the footbath and wipe their feet on the mat. The mat will scrub their shoes and apply disinfectant.
6. When the liquid starts to get dirty, empty it and put in new disinfectant.

Using "fake grass" in a footbath helps scrub shoes.

Mix disinfectant with water and cover the "grass" mat in the bottom of the pan.



Conclusion

Biosecurity is an important part of keeping flocks safe and healthy. It also is a proven method for saving money. Simple measures can be taken to promote biosecurity in backyard flocks. By cleaning regularly, limiting contact from visitors, and being careful not to bring disease home, backyard or youth poultry producers can increase the health of their flock and decrease the chance of disease. Biosecurity is crucial to the success of any operation.

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