Module 3: Common Poultry Diseases and Prevention Methods

What You Will Learn in This Module:

When you have completed this module, you should:
- know how a disease is defined
- be familiar with disease-causing agents
- recognize the vulnerabilities of poultry
- know what symptoms to look for to identify high-risk poultry diseases
- know who to contact when you have sick birds

What Is a Disease?

In common terms, disease is an abnormal condition that is caused by infection, basic weaknesses, or environmental stress. A disease is defined by a specific group of signs or symptoms. Diseases prevent affected animals from functioning normally.

Health is the overall condition of an animal at a given time. Disease causes this condition to weaken. This can result in poor productivity and reduced quality of the affected animals. It could even lead to the death/loss of one or all of the birds in a flock.

Diseases can be categorized by common causes, such as genetic, mechanical, toxic, and nutritional. Infectious diseases are caused by viruses, bacteria, and fungi. Parasitic diseases are caused by protozoa, worms, and external parasites such as mites and lice.

Infectious agents, commonly referred to as “germs,” move from one susceptible bird to another in order to survive. For this to occur in a flock, a sufficient number of disease-causing agents must be able to gain access to the susceptible birds. These are birds that have no immunity or other resistance against these agents or whose defense mechanisms have been reduced or overwhelmed at the time of infection.

Why Is Disease Such a Concern in Poultry?

Certain diseases have the potential to decimate a region’s poultry industry. When one of these diseases strikes, a quarantine or embargo could suddenly be placed on a region or nation. This could cause widespread economic hardship for both commercial and small flock owners. To protect their animals—and the poultry industry—flock owners must be able to identify diseases quickly to prevent them from spreading to other animals. The sooner a disease is identified and action is taken, the better.

How Are Diseases Spread?

Diseases are spread by:
- direct contact (bird-to-bird, infected manure)
- indirect contact (contaminated equipment, people, environment)
- vectors (wild animals, rodents, insects)

In addition, infectious agents need a “home base,” or reservoir of the disease, to persist in an area. This reservoir could be other birds or organic matter providing life support for these agents. Disrupting the methods by which diseases are spread can greatly reduce the threat to your flock.
Poultry Diseases with High Devastation Rates

Some diseases have a greater effect and higher consequences for the bird population than other diseases. One of these, pullorum-typhoid disease, caused such concern that it prompted the creation of the National Poultry Improvement Plan. Active efforts by the NPIP to control this disease have proven very successful, and as a result, the disease has nearly been eradicated. However, pullorum-typhoid testing needs to be continued due to continued exposure from imported birds and other sources.

But while concern about pullorum-typhoid disease has been reduced significantly, other diseases still threaten today’s poultry population. Two of these are avian influenza and exotic Newcastle disease.

By becoming educated about these diseases, flock owners can protect their birds and promote better animal health. Below are descriptions of these diseases, including their symptoms, how they are spread, and effective prevention methods. Take time to become familiar with this information.

Avian Influenza

Avian influenza (AI) is a respiratory disease of birds. AI viruses can infect chickens, turkeys, pheasants, quail, ducks, geese, and guinea fowl, as well as a wide variety of other birds. Migratory waterfowl seem to be a natural reservoir/host for AI viruses. Type A influenza viruses are classified according to the severity of illness they cause. AI viruses can be classified into low pathogenic and highly pathogenic based on the severity of the illness they cause in birds.

Low Pathogenic Avian Influenza (LPAI): Most AI strains are classified as LPAI and cause few clinical signs in infected birds. Birds with LPAI may appear healthy and without signs of sickness. However, LPAI can cause mild clinical signs, such as slight facial swelling and some respiratory symptoms. LPAI is monitored because two strains of LPAI—the H5 and H7 strains—can mutate into highly pathogenic forms.

Highly Pathogenic Avian Influenza (HPAI): This is a very infectious and fatal form of the disease that, once established, can spread rapidly from bird to bird or flock to flock. One gram (approximately one fourth of a sugar packet) of contaminated manure can contain enough virus to infect 1 million birds. HPAI typically causes severe illness with high death losses.

How AI Is Spread: AI viruses spread primarily by direct contact between healthy and infected birds through respiratory secretions and feces. The disease can spread through:

- exposure of poultry to wild waterfowl
- illegal international movement of birds
- movement of people and farm equipment
- smuggling of poultry and poultry products
- contaminated poultry equipment (such as cages and crates, manure, vehicles, and egg flats) and people whose clothing or shoes have come into contact with the virus
- direct bird-to-bird contact

Survival Period of the AI Virus: HPAI viruses can remain viable at moderate temperatures for several weeks in the environment and can survive indefinitely in frozen material. The virus can be killed by dehydration or sunlight.
Clinical signs of HPAI:
- sudden death without clinical signs
- lack of energy and appetite
- decreased egg production and/or soft-shelled or misshapen eggs
- swelling of the head, eyelids, comb, wattles, and legs
- purple discoloration of the wattles, combs, and legs
- nasal discharge, coughing, and sneezing
- lack of coordination
- diarrhea

Prevention of AI:
- House poultry indoors.
- Avoid the use of farm ponds and bird feeders.
- Avoid all contact with wild and domestic waterfowl.
- Avoid live bird markets.
- Control cats, rodents, beetles, insects, and other pests.
- Seek diagnostic help on unusual deaths.
- Avoid contact with your flock if working in poultry or swine processing.
- Try to avoid sharing equipment. If you share or borrow equipment, thoroughly clean and disinfect.

Exotic Newcastle Disease

Exotic Newcastle disease (END) is a contagious and fatal viral disease that affects all bird species. It is one of the most infectious poultry diseases in the world. END is so deadly that many birds die without showing any signs of disease. In unvaccinated poultry flocks, a death rate of almost 100 percent can occur, and END can cause death even in vaccinated poultry. Poultry hobbyists and owners of pet birds should be especially careful because birds illegally smuggled into the United States are not quarantined and tested by U.S. Department of Agriculture and, therefore, may carry the END virus.

How END Spread:
- primarily through direct contact between healthy birds and the bodily discharges of infected birds
- rapidly among birds kept in confinement, such as commercially raised chickens and turkeys
- through exposure to virus-bearing material picked up on shoes, clothing, equipment, and vehicles

Survival Period of the END Virus: The virus that causes END can survive in a warm and humid environment for several weeks. This environment could be birds’ feathers, manure, and other materials. Frozen, the virus can survive for extremely long periods. However, it is destroyed quickly by dehydration or sunlight.

Clinical Signs of END:
- sneezing, gasping for air, nasal discharge, coughing
- greenish, watery diarrhea
- depression, muscular tremors, drooping wings, twisting of head and neck, circling, and paralysis
- partial to complete drop in egg production
- production of thin-shelled eggs
• swelling of tissues around the eyes and in the neck
• sudden death and a high death rate in infected flocks

Prevention of END: Prevention of END can be done through sound vaccination programs and practicing biosecurity. Also, avoid contact with pet birds that belong to others, game fowl, and live bird markets.

Pullorum-Typhoid Disease

Pullorum-typhoid (PT) bacteria are host-adapted, with all types of fowl being vulnerable to infection. Turkeys, for instance, are very prone to the disease. For them a serum test must be used, since research has shown this is most effective for these particular birds. Chickens are especially susceptible to pullorum-typhoid disease. Both hens and roosters can carry the bacteria, oftentimes doing so without showing any outward sign of infection. Occasionally, though, an adult bird’s joints may show signs of swelling, which is an indicator of possible pullorum-typhoid contamination.

How PT Spreads:
• primarily transmitted from hen to young hatchlings directly through the egg
• often localized in the reproductive organs of a diseased female
• can also be transmitted through the digestive and respiratory secretions of infected birds

Survival Period of PT: Pullorum-typhoid bacteria can live in birds or eggs for more than a few weeks in the appropriate temperatures. The bacteria can be inactivated in extreme freezing temperatures and killed in extreme heat.

Clinical Signs of PT:
• signs of swelling in joints of adult birds
• severe lesions on many of the internal organs
• white pasty excrement (the disease was originally called bacillary white diarrhea)
• physical appearance of chicks and poults (drowsiness, lack of appetite, drooping wing, labored breathing, swelling in joints, and a stunted or distorted body appearance)
• high death rate in the first three weeks after hatching, sometimes approaching 100 percent of the brood

Prevention of PT:
Since pullorum-typhoid disease is primarily transmitted through breeding, eliminating carriers from a flock is a key element of prevention. Blood testing by NPIP participants has helped to identify disease carriers and contributed to the success of NPIP prevention efforts. Educating flock owners about the steps to take following a potential positive result has also helped to eliminate this disease.

Additional information about Avian Influenza, Exotic Newcastle Disease, and Pullorum-Typhoid through the Indiana Board of Animal Health (BOAH) and the USDA:
• Link to BOAH AI info page: http://www.in.gov/boah/2390.htm
• Link to USDA AI info page: http://www.aphis.usda.gov/animal_health/birdbiosecurity/AI/
• Link to BOAH END info page: http://www.in.gov/boah/2389.htm
• Link to USDA END info page: http://www.aphis.usda.gov/animal_health/birdbiosecurity/end/
• Helping you, the Poultry Breeder, Prevent Disease: http://www.aphis.usda.gov/publications/animal_health/content/printable_version/HelpingYouPoultryBreeder-PA1708-FinalJuly09.pdf
**When You Recognize a Disease Problem in Your Flock**

1. **Take steps immediately to reduce the spread of disease.**

   If you suspect that a disease is present in your flock, taking steps to contain it will reduce its effect and eliminate it sooner. To prevent the disease from spreading to even more birds—both within your flock and to other flocks throughout the industry—take the following precautions:
   - Separate the sick bird(s) from the rest of the flock.
   - Do not allow any person or equipment to come into contact with your flock or property until you can consult with a veterinarian.
   - Shower and disinfect your clothing and footwear after contact with the sick bird(s) or its environment; you will need to repeat these actions each time you have further contact with the sick bird(s).

   There are many additional steps you can take to reduce the risk of infection for your birds. Module 4 contains more information about protecting your flock through a biosecurity plan, or a group of actions that are used specifically to prevent the spread of diseases.

2. **Contact your veterinarian.**

   When a bird shows signs of being ill, symptoms alone may not be enough to diagnose a particular disease, since some diseases share similar symptoms. You should ask your local veterinarian to diagnose all unidentified illnesses. If you do not have a veterinarian, contact your county extension office at [http://www3.ag.purdue.edu/extension/Pages/Counties.aspx](http://www3.ag.purdue.edu/extension/Pages/Counties.aspx).

3. **Contact the Purdue Animal Disease Diagnostic Laboratory.**

   This facility can perform the tests necessary to help diagnose a disease in your flock. In northern Indiana, contact the West Lafayette location at (765) 494-7440. In southern Indiana, contact the Dubois location at (812) 678-3401. Their website is [https://www.addl.purdue.edu/](https://www.addl.purdue.edu/)

4. **(Optional) Call the USDA’s Biosecurity for the Birds toll-free hotline at (866) 536-7593.**

   The USDA operates a toll-free hotline that can offer information about the proper steps for dealing with a possible disease outbreak. They can provide a local contact.
Module 3 Quiz

**Question 1:**
Which of the following describes a disease?
a. It is an abnormal condition that is the result of infection, weaknesses, or environmental stress and prevents normal functioning
b. It is characterized by an identifiable group of signs or symptoms
c. It has the potential of decimating a region’s poultry industry
d. All of the above

**Question 2:**
In what way do viruses spread?
a. Direct contact (bird-to-bird, infected manure)
b. Indirect contact (contaminated equipment, people, environment)
c. Vectors (wild animals, rodents, insects)
d. All of the above

**Question 3:**
What poultry disease is so virulent that many birds die without showing any clinical signs?
a. Exotic Newcastle disease
b. *Salmonella gallinarum*
c. Pullorum-typhoid disease
d. *Mycoplasma gallisepticum*

**Question 4:**
What prevention methods should be practiced to lower the risk of avian influenza?
a. Avoid wild and domestic waterfowl, bird feeders, live bird markets, and housing poultry outdoors
b. Control cats, rodents, beetles, insects, and other pests
c. Avoid contact with your flock if working in poultry or swine processing
d. All of the above

**Question 5:**
Who do you contact if you have sick birds?
a. Local veterinarian
b. Purdue Animal Disease Diagnostic Laboratory
c. USDA’s Biosecurity for the Birds toll-free hotline
d. You should call “c” first, then “a”, and then “b”
e. You should try calling “a” first, then “b”, and then “c” if necessary

Go to Quiz Key, Module 3