Chapter 16 - Lesson 6

Pullorum-Typhoid, Avian Influenza, & Exotic Newcastle Control Programs

Pullorum-Typhoid Diseases

Two important diseases common to chickens, turkeys, and other fowl are pullorum disease and fowl typhoid. Pullorum disease (*Salmonella pullorum*) is infectious to chickens and turkeys, and fowl typhoid (*Salmonella gallinarum*) is infectious to poultry. Both bacterial diseases readily spread to day-old chicks by infected breeders through the egg hatching process. *Salmonella* infections are capable of producing severe, rapidly spreading disease, especially in young chickens and turkeys. Confirmed laboratory tests are reported to the state animal health agency.

National Poultry Improvement Plan

The National Poultry Improvement Plan (NPIP) is a voluntary state-federal cooperative testing and certification program. Participants that test negative are classified as “U.S. Pullorum-Typhoid Clean.” In 1935, the NPIP became operative with the approval of the Secretary of Agriculture and under the authority of an appropriation made by Congress for the USDA. The program is designed to be used in cooperation with state authorities in the administration of regulations.

Regulations by the NPIP are implemented for the improvement of poultry, poultry products, and hatcheries. The objective of the Plan is to provide a cooperative program through which new technology can be effectively applied with respect to hatchery disseminated diseases.

Sale and Movement of Poultry

For interstate and international movement, most states and countries require that hatching eggs and poultry originate from flocks participating in the NPIP. All poultry going to public exhibition or public sale must be tested for pullorum-typhoid and found to be free of infection, or must originate from certified “Pullorum-Typhoid Clean” flocks. All hatcheries and breeder flocks used in the production of offspring for sale or trade must register with a state Pullorum-Typhoid.
Program Office. However, some untested flocks do exist. To be sure poultry producers avoid the risks of these diseases, they should always insist on “Pullorum-Typhoid Clean” stock.

**Avian Influenza**

Avian influenza (AI) is caused by a virus and affects many bird species including chickens, turkeys, pheasants, quail, ducks, geese, and guinea fowl. The many different strains are organized into two classifications:

- Low-pathogenic avian influenza (LPAI), which is endemic to the United States
- High-pathogenic avian influenza (HPAI), which is considered a foreign animal disease

Continued laboratory tests are reported to the state animal health agency.

**Transmission**

The natural reservoir for the virus is migratory waterfowl. Infected birds carry the virus in their intestines and shed it, potentially infecting other birds. Susceptible birds that come into contact with the saliva, feces, or nasal excretions of infected birds may become infected themselves.

Studies have shown that 1 g of manure contaminated with an HPAI strain can contain enough virus to infect 1 million birds. The virus can also be spread through contact with contaminated equipment, vehicles, egg flats, crates and people (including their clothing and shoes).

**Clinical Symptoms**

With either strain, birds can show a variety of symptoms, including:

- Sudden death without clinical signs
- Lack of energy or appetite
- Decreased egg production
- Soft-shelled or misshapen eggs
- Swelling of the head, eyelids, comb, wattles and hocks
- Purple discoloration of the wattles, comb and legs
• Nasal discharge
• Coughing and sneezing
• Incoordination
• Diarrhea
• No clinical signs

The most common strain is LPAI. Most birds that contract the LPAI strain have few if any symptoms. LPAI is a reportable disease and is considered low risk.

HPAI, on the other hand, is highly infectious and must be reported. It is considered to be highly pathogenic based on several criteria, one being that it results in more than 70% mortality within 10 days. The strain present is determined by the severity of the disease. This strain is so virulent that it can infect and kill flocks before any clinical signs are observed. If HPAI is suspected, state and federal animal health regulatory agencies will quarantine the premises to help contain the disease.

**Prevention**

Producers can decrease the chance of AI being introduced into their flocks by:

• Keeping poultry houses locked
• Fastening windows from the inside
• Providing clothing (including shoes, boots, hats, and gloves) for all workers to wear when caring for flocks; this clothing is kept separate from clothes worn off the farm
• Changing clothes completely and washing hands and arms before leaving the premises
• Prohibiting workers from visiting any other poultry flocks
• Prohibiting visitors from going in or near the poultry houses
• Requiring that essential visitors put on protective outer clothing, boots and head wear, before going near flocks
• Essential visitors include owners, meter readers, service personnel, poultry catchers and haulers, and fuel and feed delivery drivers
• Making sure that vehicles entering the premises (i.e., poultry pickup or delivery and feed or fuel delivery) are scrubbed down and their undercarriages and tires sprayed with disinfectant
• Cleaning and disinfecting all coops, crates and other poultry containers and equipment before and after use
• Sending sick or dying birds to a state veterinary diagnostic laboratory for diagnosis
• In commercial operations, contacting the flock supervisor if birds become sick or die
• Properly disposing of dead birds by composting or incineration
• Making sure persons who have handled wild game (especially waterfowl) bathe and change their clothes completely before entering the poultry premises
• Posting “restricted” signs at drive entrances
• Preventing birds from being brought back to the farm from slaughter channels, especially live-bird markets

**Human Health**

Some strains of HPAI, such as the H5N1 strain, can infect people. This strain causes high mortality rates among people as well as birds. For this reason, people entering infected areas should wear adequate personal protective equipment: boots, coveralls, gloves, face masks, and headgear. They should follow appropriate sanitary and disinfectant procedures according to USDA–APHIS guidelines.

LPAI typically does not infect people; it poses a reduced threat to the industry. However, if an HPAI outbreak occurs, it could serious damage the industry.

**Eradication**

If LPAI is found in a flock, the area must be cleaned and disinfected thoroughly. The virus can be deactivated by heat and drying. It is killed by most disinfectants and detergents.

Where HPAI occurs, all infected and potentially infected animals should be destroyed and the facilities cleaned and disinfected. Notify the proper authorities immediately to help eradicate this disease.
**Exotic Newcastle Disease**

Exotic Newcastle disease (END), previously known as velogenic viscerotropic Newcastle disease (VVND) is a fatal viral disease that infects all species of birds. It is highly contagious and one of the most infectious poultry diseases in the world. Confirmed laboratory tests are reported to the state animal health agency.

**Transmission**

END is transmitted primarily by direct contact when healthy birds come into contact with infected birds. The virus is excreted in the feces and in excretions from the nose, mouth, and eyes. The virus may also be spread mechanically on contaminated clothing and shoes and spread from farm to farm. Biosecurity precautions should be taken by anyone entering a poultry farm, including:

- Vaccinating and debeaking crews
- Manure haulers
- Rendering truck drivers
- Feed delivery personnel; poultry buyers
- Egg service people; employees
- Poultry farm owners; employees

END is one of the most resilient viruses. It can survive for weeks in warm, humid environments on all types of materials. It can also survive indefinitely on frozen material. However, the virus is killed rapidly when dehydrated or exposed to the sun’s ultraviolet rays.

**Clinical Symptoms**

Infected birds sometimes die before they exhibit any clinical symptoms. The incubation period for END is 2 to 15 days before symptoms appear. However, if symptoms appear, they may include the following:

- Respiratory: sneezing, gasping for air, nasal discharge, coughing
- Digestive: greenish, watery diarrhea
- Nervous: depression, muscular tremors, drooping wings, twisting of head and neck, circling, complete paralysis
- Partial to complete drop in egg production
- Production of thin shelled eggs
- Swelling of the tissues around the eyes and in the neck.

If any of these symptoms occur in a flock, a veterinarian or other health officials should be contacted immediately. They will submit samples for testing.

**Prevention**

This disease can kill an entire flock. To prevent it, producers should increase biosecurity measures, including:

- Permitting only essential workers and vehicles on premises
- Providing clean clothing an disinfection facilities for employees
• Cleaning and disinfecting vehicles (including tires and undercarriages) as they enter and leave the premises
• Avoiding visiting other poultry operations
• Maintaining an “all-in, all-out” philosophy of flock management by controlling the movement of all poultry and poultry products from farm to farm, not “skimming” mature birds from a flock for sale to a live poultry market, and cleaning and disinfecting poultry houses between each lot of birds
• Not keeping pet birds on the farm or hiring employees who own pet birds
• Excluding vaccinating crews, catching crews, and other service personnel who have visited other poultry operations within 24 hours
• Protecting flocks from wild birds that may nest in poultry houses or feed with domesticated birds
• Controlling the disposal and handling of bird carcasses, litter and manure
• Taking diseased birds to a diagnostic laboratory for examination

**Eradication**

Any producer who suspects that END has been introduced into a flock should contact a local veterinarian or state and federal veterinarians. The most effective way to eradicate END is to rapidly destroy the infected flock and impose a strict quarantine. Once the animals have been slaughtered and disposed of, the entire premises should be disinfected. Producers should wait 30 days before allowing new birds onto the premises. Poultry houses should not be repopulated with birds whose health status is unknown. Insect and rodent populations should be controlled because they can transmit the virus to birds.

**Reference**


**Questions**

1. Explain how the NPIP prevents the spread of pullorum and typhoid diseases in poultry.
2. Explain the importance of the NPIP in eradicating pullorum and typhoid diseases in poultry.
3. Explain the measures taken to prevent introduction of avian influenza in poultry operations.
4. Explain the measures taken to eradicate exotic Newcastle disease from an infected poultry farm.

**Activity**

1. Visit a poultry exhibition fair and discuss with the superintendent of the show the documents that verify the exhibited poultry meet the testing requirements of the NPIP.