

# **Public Health Veterinarian Training Program**

## **Excerpt from the Foreign Animal Disease Module**

### **Avian Influenza**

#### **Background**

Avian Influenza was previously known as Fowl Plague. The virus is in the family of Orthomyxoviridae. Clinical signs of birds with AI range from asymptomatic to an acute fatal disease of chickens, turkeys, guinea fowls, and other avian species, particularly migratory waterfowl.

Avian Influenza strains are divided into two groups based on the pathogenicity of the virus; Low Pathogenic Avian Influenza (LPAI) and Highly Pathogenic Avian Influenza (HPAI). Most strains are classified as low pathogenicity and cause few clinical signs in infected birds. High Pathogenicity Avian Influenza is frequently fatal to birds and is easily transmissible between susceptible species. Historically there have been three HPAI outbreaks in poultry in the United States, in 1924, 1983 and the most recent in Texas in February 2004.

AI viruses are classified by a combination of two groups of surface antigens; Hemagglutinin proteins, designated by "H" and Neuraminidase proteins, designated by "N". There are 16 H proteins (1-16) and 9 N proteins (1-9). These strains can mutate into highly pathogenic forms, especially the H5 and H7. The strain that is currently of concern is the H5N1 HPAI virus.

#### **Clinical Signs:**

- Marked depression with ruffled feathers
- Inappetence
- Facial edema
- Neurologic signs (torticollis and ataxia)
- Excessive thirst
- Cessation of egg production or soft shell eggs
- Green to white watery diarrhea
- Swollen combs, wattles, and periorbital edema
- Cyanotic combs with vesicles at tips and necrotic foci
- Conjunctivitis
- Death in 24 hours to 1 week

#### **Morbidity and Mortality**

The prognosis for flocks infected with HPAI is poor. Morbidity and mortality rates may be near 100 percent within 2 to 12 days after the first signs of illness. Birds that survive are usually in poor condition and resume laying only after a period of several weeks.



## Gross Lesions

Birds that die with the peracute disease and young birds may not have significant gross lesions other than severe congestion of the musculature and dehydration. In the less acute form, and in mature birds, significant gross lesions are frequently observed. They may consist of subcutaneous edema of the head and neck area, which is evident as the skin is reflected. Fluid may exit the nares and oral cavity as the bird is positioned for postmortem examination. The conjunctivae are severely congested occasionally with petechiation. The trachea may appear relatively normal except that the lumen contains excessive mucous exudate. It may also be severely involved with hemorrhagic tracheitis similar to that seen with infectious laryngotracheitis. When the bird is opened, pinpoint petechial hemorrhages are frequently observed on the inside of the keel as it is bent back. Very small petechia may cover the abdominal fat, serosal surfaces, and peritoneum, which appears as if it were finely splattered with red paint. Kidneys are severely congested and may occasionally be grossly plugged with white urate deposits in the tubules.

In spent laying hens, the ovary may be hemorrhagic or degenerated with darkened areas of necrosis. The peritoneal cavity is frequently filled with yolk from ruptured ova, causing severe airsacculitis and peritonitis in birds that survive for 7 to 10 days.

Hemorrhages may be present on the mucosal surface of the proventriculus particularly at the juncture with the gizzard. The lining of the gizzard peels easily and frequently reveals hemorrhages and erosions underneath. The intestinal mucosa may have hemorrhagic areas especially in the lymphoid foci such as the cecal tonsils.

The lesions in turkeys and domestic ducks are similar to those in chickens but may not be as marked. The gross lesions are not distinctly different from those observed with Velogenic Viscerotropic Newcastle Disease (VVND).

## Actions to Take

What is most important is that, if you see something unusual that you contact the District Office as soon as possible.

Provide information, such as the producer's name, address, and county/parish and telephone number. Also provide clinical signs, number affected and any gross lesions observed.

The District Office will notify the Area Veterinarian in Charge (AVIC) of APHIS or the State Animal Health Official (SAHO). The SAHO or AVIC will determine how the case is to be handled and the give the DO specific instructions at that time.

Follow existing FSIS procedures and retain or control any poultry products until directed by APHIS.