# NVAP Reference Guide: Avian Influenza

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Avian influenza (AI) viruses are classified by a combination of two groups of proteins: the hemagglutinin or H proteins, of which there are 16 (H1-H16), and neuraminidase or N proteins, of which there are 9 (N1-N9). Many strains of avian influenza (AI) virus exist worldwide. These viruses affect chickens, turkeys, pheasants, quail, ducks, geese, and guinea fowl as well as a wide variety of free-flying species. Migratory waterfowl have been shown to be a natural reservoir for AI. AI strains also are divided into two groups based upon the ability of the virus to produce disease.

## Low Pathogenicity or "low path" Avian Influenza (LPAI)

LPAI occurs naturally in wild birds and can spread to domestic birds. In most cases it causes no signs of infection or only minor symptoms in birds. These strains of the disease pose little significant threat to human health. These strains are common in the U.S. and around the world.

# High Pathogenicity or "high path" Avian Influenza (HPAI)

HPAI is often fatal in chickens and turkeys. HPAI spreads rapidly and has a high death rate in birds than LPAI. HPAI has been detected and eradicated three times in U.S. domestic poultry. HPAI H5N1 is the subtype rapidly spreading in some parts of the world. Most of the highly pathogenic AI viruses fall under types H5 or H7; however, most AI infections, including those typed as H5 or H7, are clinically of low pathogenicity. These typically produce few or no clinical signs in affected birds. Sometimes the only evidence of this virus is a minor increase in bird mortality. Aside from the possible mutation of low-pathogenicity strains under field conditions into high-pathogenicity strains, the presence of low-pathogenicity virus can also result in restrictions on exports and serious repercussions on the production economy. Avian Influenza of H5 and H7 subtypes are known as  Notifiable Avian Influenza (NAI). APHIS works to keep NAI from becoming established in U.S. poultry populations.

# Identifying Infected Birds

Birds infected with the HPAI virus may show one or more of the following signs:

- Sudden death without clinical signs;
- Lack of energy and appetite;
- Decreased egg production or soft-shelled or misshapen eggs;
- Swelling of head, comb, eyelid, wattles, and hocks;
- Purple discoloration of wattles, comb, and legs;
- Nasal discharge, coughing, and sneezing;
- Incoordination; or
- Diarrhea.

# Epidemiology

HPAI can strike poultry quickly and spread rapidly from premises to premises. Migratory waterfowl can introduce the disease to U.S. poultry. International visitors or smuggled  birds are also risk factors. Once introduced, the disease spreads from bird to bird by direct contact or through contact with contaminated manure,

equipment, vehicles, crates, and the clothing or shoes of individuals who have come in contact with the virus. The virus remains viable in the environment for long periods, particularly at lower temperatures, and it can survive indefinitely in frozen material.

## Biosecurity Measures on the Farm

Veterinarians should work with poultry producers to strengthen biosecurity practices. Established and enforced biosecurity protocols will help prevent introduction of HPAI and other infectious agents. Recommended biosecurity measures include

- Establishing an “all-in, all-out” flock-management policy;
- Protecting against exposure to wild birds or water or ground contaminated by wild birds;
- Closing bird areas to nonessential personnel or vehicles;
- Providing employees with clean clothing and disinfection facilities and directions for their use;
- Thoroughly cleaning and disinfecting equipment and vehicles (including tires and undercarriage) when entering or leaving the farm;
- Banning the borrowing or lending of equipment or vehicles;
- Banning visits to other poultry farms, exhibitions, fairs, and sales or swap meets (if visits must occur, direct workers to change footwear and clothing on their return); and
- Banning bringing birds in slaughter channels back to the farm.

## Reporting Suspicious Diseases

Practitioners are encouraged to educate their poultry clientele and pet bird owners to report all signs of disease. If signs of disease resemble AI or cannot be diagnosed, they should immediately be reported to both the Assistant District Director and the State Animal Health Official.

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