

Influenza

DISEASE IN ANIMALS

Of the three types of influenza, A, B, and C, only type A affects both humans and animals. Influenza A viruses in animals are diverse and constantly evolving due to genetic recombination and point mutation. Pathogenicity depends on the subtype, species affected and host immunity. Virus subtypes are characterized by H and N antigens, of which there are 135 different combinations. In addition, avian viruses are classified as “high pathogenic” or “low pathogenic,” which is a measure of virulence in poultry. Major subtypes and the primary affected species are described below:

Humans	H1N1, H2N2, H3N2 (seasonal), H1N1 (2009) (since 1997: H5N1, H7N2, H7N7, H7N2)
Swine	H1N1, H3N2, H1N2, (H3N1, H4N6, H5N1, H9N2, H1N1)
Equine	H7N7, H3N8
Poultry	Many HA-NA combinations recovered
Wild Birds	Many more HA-NA combinations recovered All HA and NA subtypes recovered
Canine	H3N8

Reporting: Any H5 or H7, or any suspected highly pathogenic influenza infection in birds must be immediately reported to the Ohio Department of Agriculture (ODA), Division of Animal Industry at (614) 728-6220 or (800) 300-9755 or the USDA APHIS Veterinary Services at (614) 856-4735 or (800) 536-7593. Reporting of other animal influenza to ODA or USDA other than H5, H7 or high pathogenic is voluntary, but encouraged. In particular, ODA is requesting reports of suspect cases of swine influenza as part of a national surveillance program.

Transmission: The virus is transmitted in droplet or aerosols created by coughing and sneezing and by contact with nasal discharges, directly or on fomites. Close contact and closed environments enhance transmission. In wild birds, the virus is also shed in the feces and spread via fecal-oral route. The virus can persist in the environment, especially in water.

Clinical signs: Primarily respiratory, but severity varies with host adaptation. In birds, low pathogenic viruses usually cause subclinical infections with a slight decrease in egg production or mortality rate. More severe illness is characterized by sinusitis, lacrimation, and edema of the head, cyanosis, diarrhea, hemorrhagic lesions, and acute high flock mortality. In mammals, fever, cough, lethargy, and nasal discharge that lasts several weeks. Abortions, hemorrhagic lesions, myocarditis and secondary pneumonia have also been described.

Highly Pathogenic Avian Influenza is a Select Agent and must be handled under Biosafety Level 3 conditions. Seek appropriate laboratory assistance with suspect animal cases. The Ohio Animal Disease Diagnostic Laboratory has BSL 3 space and is registered with CDC/USDA to work with this agent.

Diagnostics:

- Ag detection ELISA (Rapid test), DFA or IFA: detects Influenza Type A
- RT-PCR: matrix, H and N genes
- Serology (agar gel immunodiffusion, HI & ELISA): useful for surveillance & identification of naive individuals
- Virus isolation

Case classification:

- Suspected: a clinical case with signs consistent with influenza.
- Probable: a clinically suspect case with laboratory evidence from a screening or unvalidated test.
- Confirmed: a case that meets confirmatory testing criteria determined by a state or federal diagnostic laboratory.

DISEASE IN HUMANS

Reporting: Any positive laboratory finding of influenza associated with a hospitalized patient or a pediatric death must be reported to the LHD. Reporting of persons with influenza-like illness with exposure to animals with respiratory disease should also be reported to the [local health department](#) (LHD) as it may be a novel influenza virus. Novel subtypes include, but are not limited to, H2, H5, H7, and H9. Influenza H1 and H3 subtypes originating from a non-human species or from genetic reassortment between animal and human viruses are also novel subtypes. Non-human influenza viruses include avian subtypes (e.g. H5, H7, or H9 viruses), swine and other mammalian subtypes. Suspected novel influenza cases should be reported immediately via telephone the case or suspected case and/or a positive laboratory result to the LHD where the patient resides. If unknown, report immediately to the LHD within the jurisdiction of the health facility or ODH.

Human illness: Typically, influenza causes an acute infection of the respiratory tract characterized by fever (101° to 102° F, usually with an abrupt onset), chills, headache, myalgia, prostration (extreme exhaustion), coryza, sore throat and cough. GI symptoms (e.g. nausea, vomiting, and diarrhea) sometimes occur in children. Most uncomplicated infections subside in three to seven days. Complications associated with influenza include febrile convulsions, viral pneumonia, bacterial pneumonia (e.g. pneumococcal, staphylococcal), otitis media, sinusitis, acute myositis and Reye syndrome.

Personal protection: Persons working around animals should not eat, drink, or smoke during their duties and should wash their hands frequently. Personal protective equipment e.g. coveralls, gloves, and respirators (preferably at least N95), eye protection (goggles), and boots or protective foot covers are recommended when working around animals with known or suspected influenza. Swine and poultry workers are highly encouraged to receive the current season's inactivated influenza virus and consider antiviral drug prophylaxis when activities involve exposure to a highly pathogenic avian or other novel influenza virus thought to be pathogenic to humans. If exposed, humans must monitor their health for influenza symptoms for one week after last exposure and seek medical attention if illness develops. During this time, they should take measures to prevent spread to contacts and household members. Ill persons must practice good respiratory and hand hygiene, including wash your hands often with soap and water, especially after you cough or sneeze, and avoid touching your eyes, nose or mouth.

FOR MORE INFORMATION**Reportable Animal Diseases in Ohio**

[ODA Division of Animal Industry](#)

[OAC Chapter 901:1-21 Dangerously Contagious or Infectious and Reportable Diseases](#)

[USDA Animal and Plant Health Inspection Service](#)

Disease in Animals

[Ohio Animal Disease Diagnostic Laboratory](#)

[Iowa State University Center for Food Security and Public Health Animal Disease Factsheets](#)

[OIE Manual of Diagnostic Tests](#)

[USDA Animal and Plant Health Inspection Service Animal Diseases](#)

Disease in Humans

[ODH Infectious Disease Control Manual](#)

[CDC-Influenza](#)