Emerging Risk Notice

October 2019

H9N2 and H3N1 Avian influenza viruses

Key Points

There are two non-H5/H7 avian influenza viruses currently circulating outside the United States which pose a potential risk to U.S. poultry. One is a poultry-adapted H9N2 virus from Asia, and the other is a European wild bird origin H3N1 virus infecting poultry. Both lineages are categorized as low pathogenicity, per the testing prescribed by OIE, and neither are internationally reportable; however, each have been reported to have become poultry-adapted, causing increased morbidity and mortality in poultry.

The Eurasia H9N2 infection has been linked to human illnesses. Additional information on influenza viruses communicable to humans is available from the Centers for Disease Control and Prevention.

Poultry-adapted H9N2

- This virus has been endemic among poultry in Asia since the early 2000's and has spread to poultry in other countries, becoming endemic in the Middle East and Africa. In the past year, Russia has also reported the virus.
- There are several lineages of this poultry-adapted virus which have become endemic among poultry in some countries and some caused human infections.[3, 8]
- Although the H9N2 subtype has sporadically been reported in U.S. poultry, these detections represent North American wild bird lineage viruses and are readily distinguishable from the poultry-adapted Asian H9N2 lineage.

Wild bird origin H3N1 in Europe

- The H3N1 virus was recently detected by animal health officials in Belgium and France, and the initial introduction of the virus was likely from a wild bird source. As with the H9N2 above, this virus is readily distinguishable from North American H3 viruses.
- Between April 6 and July 4, 2019, the Belgium Federal Agency for the Safety of the Food Chain (FASFC) detected H3N1 virus on poultry farms (primarily laying hens and broiler breeders). Some flocks experienced production drops of up to 100 percent and mortality rates up to 60 percent. However, at least one infected flock showed no clinical signs; the potential of cofactor/co-infection involvement in flocks experiencing high morbidity/mortality is being investigated.[6]
- In the north of France, about 5 miles from the Belgium border, three epidemiologically-linked poultry flocks were also reported in May 2019 to be infected with H3N1. The outbreaks had similar production losses and mortality as those observed in Belgium.[4]
- With the increased morbidity and mortality associated with H3N1 infection, Belgium sought permission from the European Commission to cull birds and provide compensation, a measure usually reserved for outbreaks of highly pathogenic avian influenza.[5]

Concerns for US Animal Health

- The current risk of introduction of the H9N2 or H3N1 viruses to U.S. poultry through imports of live birds or products is considered low when U.S. import requirements are followed.
- Illegal importation of infected poultry or poultry products represents the greatest risk for introduction of the poultry-adapted lineages of H9N2 virus into the U.S.
- As a wild bird origin virus, the H3N1 could potentially reach the U.S. via intercontinental migratory bird movements.[1, 2] Poultry production premises vulnerable to wild bird contacts are at greater risk.[7]
- Early notification and response are essential to prevent serious impacts to U.S. poultry.

Epidemiology

- In chickens and turkeys, clinical signs may include mild respiratory disease (noise, swollen faces, conjunctivitis). In breeders, it can also cause a production drop, and birds may produce soft shelled eggs. With severe variants of the avian influenza viruses, the birds may become very quiet, not eat or drink, have diarrhea, and discolored combs and feet. Birds may also die suddenly without any signs of disease.
- Although it is possible for domestic poultry to become infected with avian influenza from direct contact with wild birds, it is more likely that avian influenza viruses are spread indirectly to poultry on contaminated feed, clothing, and equipment.
- Avian influenza subtypes H5 and H7 viruses are reportable regardless of pathogenicity; however, avian influenza of other subtypes are not internationally reportable, and as with the lineages of H9N2 and H3N1 presented in this Notice, may enter the poultry sector and spread, causing significant morbidity and mortality. If this occurs, investigation and testing is necessary to identify the cause of the change in health status of the flock with differential diagnoses including avian influenza.

Diagnostic Testing

- In the U.S., avian influenza surveillance testing is designed to detect influenza A, and the laboratories that conduct official testing [the National Animal Health Laboratory Network (NAHLN) and the National Poultry Improvement Program (NPIP) laboratories] are obliged to forward any influenza A or antibody detection to the National Veterinary Services Laboratories (NVSL) for further characterization, which includes sequence determination of subtype as well as lineage.
- It is of critical importance to promptly notify the State or Federal Animal Health Official when unexplained high morbidity and mortality are present in poultry. A Foreign Animal Disease Investigation (FADI) may be initiated to include required sample collection and submission for avian influenza testing. (9CFR 145.15) (FADI). Refer to *Avian Sample Collection for Influenza A and Newcastle Disease*.

Treatment

- Avian influenza vaccines can prevent clinical signs and death in poultry and may reduce viral replication and shedding from the respiratory and GI tracts.[9] Available licensed vaccines are likely poor antigenic matches to the H3N1 and H9N2 poultry-adapted AI strains, and will provide suboptimal performance. Licensed AI vaccine may only be used as part of an official USDA animal disease control program.

Prevention

- Producers are encouraged to prevent wild birds and other wildlife from coming into direct contact with their poultry, and to avoid transporting wild bird fecal material and secretions to poultry via boots, equipment, and feed.[10]
- Improving biosecurity is an effective strategy to reduce the risk of introduction and spread of avian influenza in the U.S. (NPIP Biosecurity Principles and What Poultry Growers need to Know)
- For early detection, notify your State and Federal Animal Health authorities if changes in your poultry's health status, such as those noted below, occur at the house level:
  - There is a reduction of more than 20% in water and food consumption;
  - The mortality rate is more than 3% per week;
  - Egg production falls more than 5% for more than two days;
  - Clinical signs or lesions suggesting the presence of avian influenza are found during post-mortem examination

Sources

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