CFAES

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Avian Influenza

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Figure 1. Chickens are among the bird species susceptible to Avian Influenza.

Outbreaks of Highly Pathogenic Avian Influenza (HPAI) in poultry (Figure 1) and wild birds are happening worldwide. The majority of the cases have happened in European and North American countries, but more recently, outbreaks started to occur in Central and South America [World Organization for Animal Health (WOAH)]. In the US, 58.39 million commercial and backyard birds have been affected, impacting mainly egg prices but also turkey prices [USDA, 2022; USDA, 2023]. The severity and dimension of the current epidemic represent a threat to birds' health, the livelihood of farmers, and food security.

Avian Influenza (AI) is caused by influenza virus A from the Orthomyxoviridae family. Subtypes are classified according to hemagglutinin (H) and neuraminidase (N) antigens. There are 16 H (H1-16) and 9 N (N1-9) subtypes officially recognized; the predominant subtype linked to the present outbreak is H5N1.

AI is divided into low or high pathogenicity avian influenza according to the subtype and virulence of influenza A viruses; HPAI are cases involving subtypes H5 or H7 or other subtypes causing high pathogenicity (HP) using intravenous inoculation; LPAI are infections with any H subtype (H1-16) not causing high pathogenicity. Although AI caused by LPAI viruses does not cause severe clinical signs, LPAI viruses can mutate and become HPAI [WOAH].

Clinical signs vary depending on the bird species, immunological status, and virus virulence. In domestic birds, including chickens and turkeys, general respiratory signs can be observed, including coughing, difficulty breathing, and swelling of the sinuses and/or head, in addition to cyanosis, incoordination, tremors, twisted necks, decreased water and feed consumption, and diarrhea.

In some cases, no clinical signs are present, only sudden death [University of Minnesota Extension; WOAH]. Aquatic birds, mainly waterfowl and shorebirds, are the natural reservoir of AI viruses. The spread of AI viruses has been linked to the large congregations, seasonal

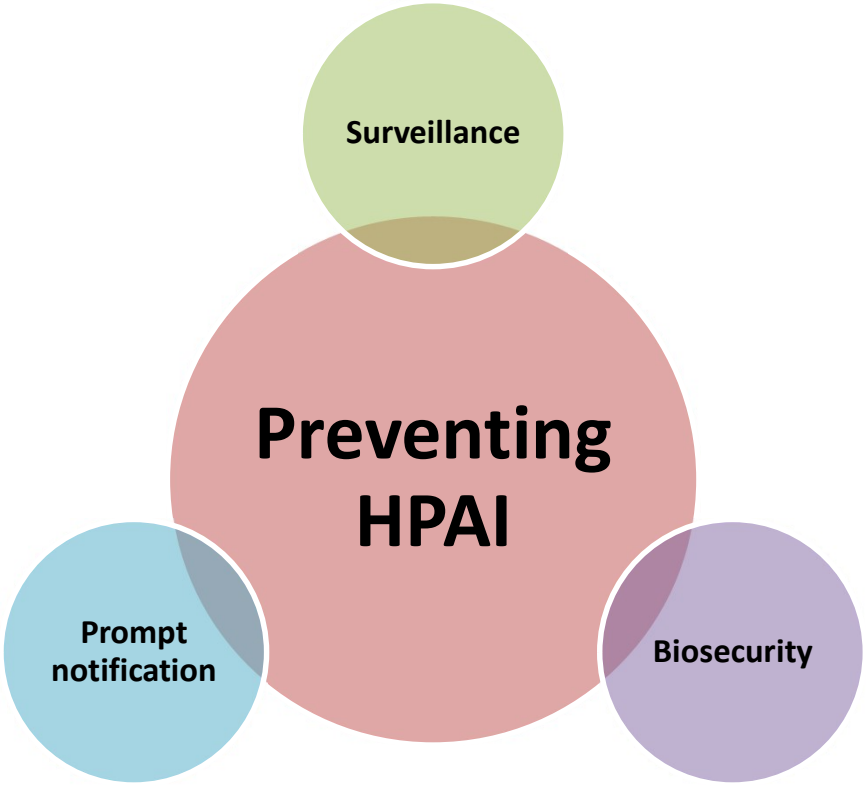

Figure 2. Preventing future highly pathogenic avian influenza (HPAI) outbreaks.

migration, and interconnection of migratory routes of wild birds. All the elements behind the severity of the current outbreak remain unclear. Compared to past HPAI outbreaks, the present H5N1 subtype seems to infect a diverse range of wild bird species, leading to clinical signs and mortality in some cases and also infecting mammals more frequently [Sidik, 2022; USGS National Wildlife Health Center]. It is important to emphasize that wild birds and mammals should not be harmed to avoid transmission of HPAI. Conservation of wildlife habitats is part of a planetary health approach.

Avian influenza is a zoonotic disease, meaning that it can be transmitted to humans. However, presently, **the risk for public health is considered low** because human cases have been sporadic, and no human-to-human transmission has been observed [CDC; World Health Organization]. People at risk are those in direct contact with birds (farms, shows, and live markets). Transmission of HPAI is not associated with the consumption of poultry products adequately prepared and cooked.

Strong biosecurity measures are the only and best tool that we have right now to avoid new outbreaks in birds and to avoid causing human transmission, even though the risk for public health is considered low.

Some biosecurity measures include:

- Use designated clothes, rubber boots, and work gloves when handling birds
- Wash your hands after handling birds
- Keep domestic birds away from wild birds
- Keep domestic birds away from open water
- Protect feed and water sources from wild birds
- Restrict visitors
- Avoid visiting other domestic and wild birds
- Develop an integrated pest management control

To see more biosecurity measures, check the "Defend the Flock Program" by USDA and for more measures to prevent contact with wild birds, click here.

If your birds are showing clinical signs related to AI, or sudden death is occurring, contact a veterinarian or state authorities. In Ohio, the Department of Agriculture's (ODA) Animal Disease Diagnostic Laboratory and the Ohio Poultry Association can be contacted when a case in domestic birds is suspected. In case of a sick or dead wild bird, report it to the Ohio Division of Wildlife.

Due to the enormous impact of HPAI not only on birds, financial and mental stress on farmers, and international trade restrictions, the efforts to prevent outbreaks need to be holistic, global, and collaborative, including **surveillance of wild birds in popular flyways and breeding grounds, strengthening biosecurity measures in poultry farms and backyard flocks, and prompt notification of new outbreaks (Figure 2)**. International organizations, including the World Health Organization (WHO), the World Organization for Animal Health (WOAH), and the Food and Agriculture Organization (FAO), together with authorities at the country level, such as USDA and CDC in the USA, are constantly monitoring and evaluating the risk of outbreaks of HPAI for animal and human health.

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