

Risk assessment of acquiring Avian Influenza from Poultry Products: Executive Summary

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Avian influenza (AI) viruses cause infections primarily in bird species, although they are capable of spill-over infections into mammalian species, including humans. Many different strains of AI viruses are found in birds, but they can be divided into two groups based on their virulence in poultry: high pathogenicity (HPAI) and low pathogenicity (LPAI); both are capable of quickly spreading through a flock. HPAI infections often lead to severe clinical signs and high mortality while LPAI infections may not present with any clinical signs. Certain strains of AI have been associated with human case fatality rates of over 50%.

Since October 2021, there has been a substantial increase in the number of AI infections reported both at commercial premises and in wild birds in the UK. The last FSA assessment on the risk to consumers of exposure to AI from the food chain was in 2015. Since the increase in infections may lead to an increased likelihood that poultry products from infected birds are entering the retail market, an updated risk assessment was commissioned to ensure advice relating to the consumption of poultry products is still appropriate. This risk assessment did not focus on the currently circulating outbreak strain but considered any AI virus.

This assessment considered the risk of consumers acquiring an AI infection from poultry products, including commercial poultry, game birds, and table eggs. The risk of home processing of birds was also considered. The farm to fork risk pathway spanned from the probability that products from infected poultry would reach market to the ability of AI to cause infections in humans via the gastrointestinal route.

HPAI causes systemic infections in birds, so it can be found in feathers, blood, organs and muscle tissue. It may also be present on eggshells and in the yolk and albumen of eggs. For HP AI infections in commercial poultry, it was considered unlikely that meat and eggs from infected flocks would reach retail as the severity of clinical signs would lead to rapid detection of the infection and removal of the flock and any associated products from the food chain. Evidence also suggested that some game birds, like pheasants and grouse, infected with HPAI would unlikely be processed for consumption due to either their clinical signs preventing them from being

available for shooting or trained hunters recognising signs of infection and thus disposing of those birds. However, some game birds, like wild ducks and geese, do not exhibit obvious clinical signs even when infected with HPAI viruses.

LPAI infections are mostly restricted to the respiratory and gastrointestinal tract in infected birds, although there is limited experimental evidence that these viruses can infect other tissues and contaminate eggs in some species of birds. The lack of clinical signs when birds are infected with LPAI means there is a greater probability infected birds may be processed to enter the food chain, but the virus is unlikely to be present in the products that would be reaching the consumer because little or no virus has been reported in muscle tissue or eggs.

Despite the increase in AI outbreaks around the world in the past two years, there has not been an observed increase in human infections. This suggests there is a sufficient species barrier for current circulating clades to limit humans becoming infected with AI. When human cases have occurred, infection usually follows close, direct contact with infected birds as opposed to consumption of poultry products. This, combined with the fact that AI viruses are heat-labile and inactivated by cooking, reduces the likelihood that infection would occur in humans even if exposed to poultry products contaminated with AI.

The risk of acquiring AI from poultry products was considered on a UK population basis; subpopulations were considered for some situations when evidence indicated the activity (consumption or processing) was undertaken infrequently. The likelihood of infection for people in the UK from handling and consuming commercial chicken or turkey is **negligible (so rare that it does not merit to be considered)** with **low uncertainty**. For the consumption of farmed duck and geese and wild game birds, the likelihood is **very low (very rare but cannot be excluded)** with **medium uncertainty**. Given the difference in likelihood for systemic infections between virus types, HPAI and LPAI were considered separately for home processing of birds. Since HPAI can be distributed in tissues throughout the bird and processing birds at home could potentially include exposure by inhalation, the likelihood of HPAI infection in people handling and home processing birds is **low (rare but does occur)**. For LPAI, the likelihood is **very low (very rare but cannot be excluded)**. Both of these situations are associated with **medium uncertainty**. The likelihood of infection for people in the UK from handling and consuming hen table eggs is **very low (very rare but cannot be excluded)** with **low uncertainty**. As for the severity of illness in humans from AI infection, this was considered **high (severe illness: causing life-threatening or substantial sequelae or illness of long duration)** with **medium uncertainty**. This reflects the high case fatality rate associated with AI infections in humans, even if mild infections are also possible.

Several key uncertainties remain after reviewing the available evidence. One is around the frequency with which poultry products from infected flocks may be reaching the UK market as the data is not available to estimate this. Since AI infections in humans can present in a variety of ways, there is the possibility that human cases and the associated transmission pathways are being missed in UK surveillance. A final uncertainty relates to the ability of AI to lead to infection in humans via consumption. There is little epidemiological evidence to support this transmission pathway, but there have also been few research studies investigating it.