

Preliminary rapid risk assessment of foodborne avian influenza A (H5N1) virus

Summary

- The risk of people acquiring avian influenza A (H5N1) from food is negligible. This conclusion is based on the absence of any evidence that people can become infected after ingesting the virus and the unlikely chance of exposure to infectious avian influenza A (H5N1) virus through food or drink.
- Illnesses associated with influenza viruses have been tracked for more than 100 years. During this time, there have been no confirmed reports of foodborne transmission of this virus to humans.
- Avian influenza A (H5N1) virus is destroyed by pasteurization and adequate cooking temperatures (70°C), rendering it non-infectious.
- Many diagnostic tests target and detect only very specific parts of viruses (e.g. proteins, nucleic acid), but the presence of these parts does not confirm the virus is infectious. Therefore, the presence of remnants or viral fragments of inactivated viruses can yield positive test results, even when no infectious viruses are present in the specimen.
- To further safeguard against all foodborne illnesses, consumers are advised to drink only milk that has been pasteurized and to fully cook foods of animal origin, prior to consumption.
- FAO will continually monitor the risk of foodborne transmission of avian influenza A (H5N1), as the virus can change (mutate), altering its ability to infect humans. Information is current as of 14 June 2024.

	Risk of foodborne avian influenza A (H5N1)				
Present Risk Estimate ¹	Negligible^a	Very low	Low	Moderate	High
	Classification Criteria				
Likelihood of foodborne exposure ²	Unlikely^b May occur under exceptional circumstances	Rare Is remotely possible	Possible Might occur on some occasions	Likely Will probably occur in most circumstances	Almost Certain Occurs in most circumstances
Likelihood of infection following foodborne exposure ³	Negligible^c Foodborne transmission has never been confirmed	Very low Rare following exposure to high doses in susceptible populations	Low Occasional after high dose exposure	Moderate Occasional after low dose exposure or consistently after high doses	High Occurs frequently after exposure to low doses in most individuals
Effectiveness of measures to control infectious virus in foods ⁴	Excellent^d Easily applied to reduce exposure by more than 99.99%	Good Effective at reducing contamination but inconsistently applied	Fair Moderately effective and/or only occasionally applied	Poor Interventions are ineffective or rarely applied	Unavailable Effective control measures to reduce risk to negligible are not available
Severity of disease symptoms ⁵	Negligible No adverse human health consequences	Mild Minimally bothersome and no therapy is typically necessary	Moderate More serious or of a more systemic nature Some form of treatment is usually indicated	Severe^e Potentially life-threatening and require systemic treatment	Fatal Directly or indirectly contributes to the death of the subject with greater than 90% mortality

¹The present risk estimate is an integrated measure of the likelihood and severity of the adverse effects that may occur in a population. It considers available data such as the likelihood of exposure to infectious virus and the severity of disease outcomes in susceptible populations.

^aThe risk estimate for foodborne disease is negligible because: i) avian influenza A does not transmit to humans via food, based on epidemiological evidence; ii) its presence in foods is limited to those derived from food-producing animals infected with the virus; iii) the presence of infectious virus can be readily reduced even further through routine control measures (cooking, pasteurization).

²Exposure depends upon dietary patterns and frequency of contamination of the food. Food contamination depends on the application of appropriate food safety practices, beginning with the production of the food through to the time of consumption.

^bAvian influenza A (H5N1) is absent from most foods, the exception being the potential for contamination of raw meat, undercooked eggs and unpasteurized milk from infected animals.

³To cause infection, a virus must be able to overwhelm or evade the host's defense mechanisms (e.g. stomach acidity, immune response) and be able to enter and replicate within the hosts' cells. In humans, cells that express the preferential receptors for influenza A (H5N1) and permit the virus to enter and replicate are not reported in the human digestive tract.

^cOf the very small number of individuals who have contracted avian influenza A (H5N1) worldwide (n=30, 2020 to May 2024), none have been associated with the consumption of contaminated foods.

⁴Effective control measures are those that reduce the likelihood of contamination (prevalence) or the numbers (exposure dose) of microorganisms in a food.

^dThorough cooking, to a temperature of greater than 70°C, and routine pasteurization processes, destroy the virus, rendering it non-infectious.

⁵The severity of disease following infection depends on the susceptibility of the individual who consumes the food (e.g., age, immune status, concurrent other illnesses) and the strain or subtype of the pathogen encountered.

^e Influenza viruses can cause mild to serious morbidity (illness) and mortality (death) in humans and animals. People who have become infected with avian influenza A (H5N1) following close contact with animals have developed a range of symptoms, from conjunctivitis (eye infection) or mild respiratory illness, to death. The mortality rate of the current (May 2024) avian influenza A (H5N1) subtype (clade) of concern is near 50%.

Statement of purpose – Investigations into disease and drop in milk production among dairy cattle in March of 2024 identified avian influenza A (H5N1) clade 2.3.4.4b infections in dairy cattle, a virus typically only found in birds. Three dairy farm workers who had contact with infected cattle have become sick, two with eye infections (conjunctivitis) and one person with more serious respiratory disease. However, infectious avian influenza A (H5N1) virus has not been detected in pasteurized milk and there has never been documented cases of avian influenza A in humans acquired from consuming any type of contaminated foods. The purpose of this assessment is to review global public health risks associated with the presence of avian influenza A (H5N1) virus in commonly consumed foods. Understanding of the current situation of avian influenza A in dairy cattle is still evolving (May 2024) and there are still many unanswered questions. FAO is following the events closely to protect food safety and public health. We will refine and update this assessment as appropriate. We encourage individuals to seek trusted news sources and continue to safely and confidently enjoy pasteurized dairy products and fully cooked meat and eggs that are prepared under hygienic conditions as part of a healthy diet, without the fear of acquiring avian influenza A from their foods.

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