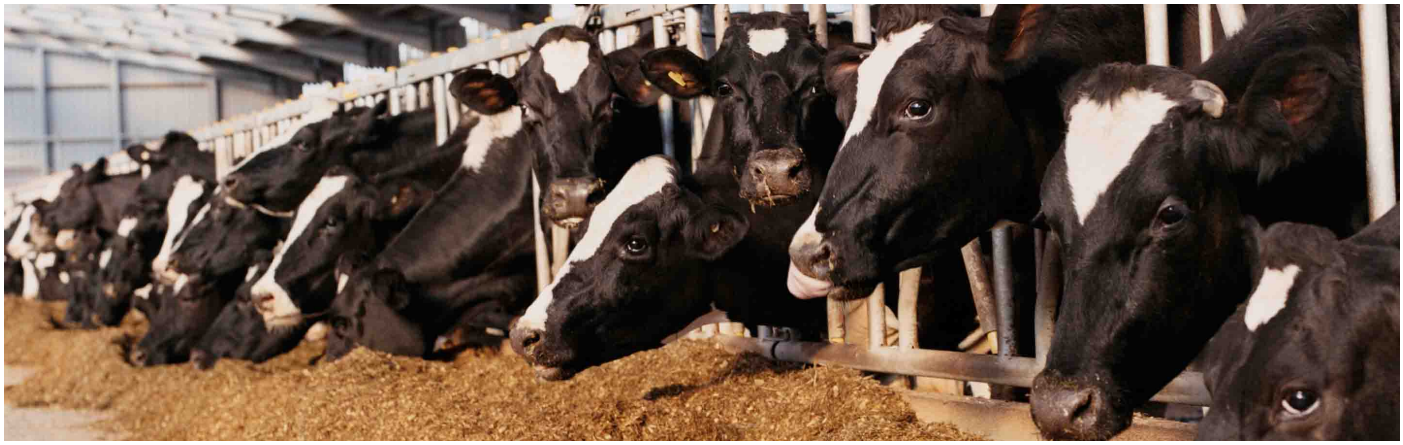
Avian influenza virus type A (H5N1) in U.S. dairy cattle



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On March 25, 2024 the U.S. Department of Agriculture (USDA), Food and Drug Administration (FDA), and Centers for Disease Control and Prevention (CDC) announced that highly pathogenic avian influenza (HPAI), specifically avian influenza virus type A (H5N1), had been identified in U.S. dairy cattle for the first time. Here are important details on this rapidly evolving situation:

- Avian influenza virus type A (H5N1) has been confirmed in dairy cattle in 16 states: 713 herds in California, 64 in Colorado, 35 in Idaho, 30 in Michigan, 27 in Texas, 13 each in Iowa and Utah, nine each in Minnesota and New Mexico, seven in South Dakota, four in Kansas, two in Oklahoma, and one each in Nevada, North Carolina, Ohio, and Wyoming. Get updates on detections here and background information here.
- Tests so far indicate that the virus detected in dairy cattle is H5N1, Eurasian lineage goose/Guangdong clade 2.3.4.4b. This is the same clade that has been affecting wild birds and commercial poultry flocks and that has caused sporadic infections in several species of wild and domestic mammals in the United States.
- Common clinical signs in affected cows include low appetite, reduced milk production, and abnormal appearance of milk (thickened, discolored). Lactating cows have been most highly affected, and signs of illness have been reported in less than 10% of cows within a herd.
- While avian influenza virus type A (H5N1) is associated with high morbidity and mortality in birds ("highly pathogenic"), this hasn't been the case for dairy cattle. Most affected animals reportedly recover with supportive treatment, and the mortality/culling rate has been low at 2% or less on average.
- The spread of H5N1 within and among herds indicates that bovine-to-bovine spread occurs. Overall, animal movement is a recognized risk for disease transmission. Evidence also indicates that the virus can spread from dairy cattle premises to nearby poultry facilities. Potential risk factors for local

transmission between facilities include shared personnel between premises; shared, uncleaned vehicles and equipment between premises; and frequent visitors on/off premises.

- There currently is no genomic or epidemiologic evidence that wild birds are spreading H5N1 to cattle, but this possibility cannot be ruled out.
- Biosecurity remains the best defense against H5N1, and farms are encouraged to practice strong biosecurity even if the virus has not been detected in their state or vicinity. The USDA also urges veterinarians and producers to monitor for, separate, and test sick animals; minimize cattle movements; and isolate and monitor any newly received dairy cattle for 30 days upon arrival.
- Since April 29, 2024, a federal order has been in effect, requiring testing of lactating dairy cattle for H5N1 prior to interstate movement, and reporting of positive nucleic acid detection and serology results for livestock to the USDA's Animal and Plant Health Inspection Service (APHIS). While the movement restriction initially applies to lactating dairy cows, this may be adjusted based on an evolving scientific understanding of the disease and risks. Find answers to frequently asked questions about the order here and guidance for producers and veterinarians here.
- A second federal order went into effect December 6, 2024, requiring that raw (unpasteurized) milk samples be collected from milk silos at dairy processing facilities nationwide and shared with the USDA for testing as part of its National Milk Testing Strategy (NMTS). The order is intended to complement the April federal order by facilitating comprehensive H5N1 surveillance of the nation's milk supply and dairy herds. It also requires that herd owners with positive cattle provide epidemiologic information and that private laboratories and state veterinarians report positive results of NMTS testing to the USDA. Testing, which is being phased in, began on December 16, with California, Colorado, Michigan, Mississippi, Oregon, and Pennsylvania comprising the first round of included states. Find updates on NMTS testing here.
- At the state level, at least 22 states have issued restrictions on the importation of dairy cattle: Alabama, Arizona, Arkansas, California, Delaware, Florida, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maryland, Mississippi, Nebraska, New York, North Carolina, Oregon, Pennsylvania, South Dakota, Tennessee, Utah, and West Virginia. State-specific restrictions on cattle movement must be followed in addition to federal requirements. If and where a particular state's requirements are more restrictive than the federal order, that state's requirements must be followed.
- Michigan issued an emergency order on May 1, 2024, to control and prevent the continued spread of H5N1 within the state by requiring that poultry and livestock producers develop and implement specific biosecurity practices.
- As of July 22, 2024, Colorado is requiring all licensed dairy cow farms in the state that are not under separate order for quarantine or testing to submit weekly bulk-tank samples for viral testing, with the aim of preventing further spread of H5N1 among dairy and poultry farms.
- California, which is the nation's top milk-producing state, declared a state of emergency in December 2024 to bolster the state's preparedness and accelerate cross-agency response efforts.
- Canada has tightened import requirements on dairy cattle from the United States.
- The USDA is providing financial assistance for producers with H5N1-affected premises to improve on-site biosecurity, as well as compensation for lost milk production. Additional financial help to promote biosecurity and viral testing is available for producers whose herds have not tested positive for H5N1.
- In addition to the national milk testing program, federal and state agencies continue to conduct testing of clinical samples, including unpasteurized milk, nasal swabs, and tissue samples, as well as samples of milk along all stages of production. They also are performing viral genome sequencing. The USDA and state health officials encourage producers to work with their veterinarians to support sampling and testing.

- Testing conducted thus far has **not** found changes in the virus that would make it more transmissible to humans.
- The USDA continues to invest heavily in vaccine research and development to help prevent the spread of H5N1 among animals. The agency is conducting field trials of HPAI vaccines for poultry and dairy cattle, and is exploring vaccine options for other species.
- The American Association of Bovine Practitioners (AABP) has a working group of its members that, together with AVMA, is communicating with federal and state officials and working on additional biosecurity guidance. AABP members can find more information about these activities here. AABP guidance on navigating the April 2024 federal order can be found here.
- The CDC recommends monitoring people exposed to infected animals of any species—including people wearing recommended personal protective equipment. Those who develop symptoms of H5N1 infection should be tested for the virus at a state or local public health department.

Impact on other animals and public health

- So far, at least 68 cats have tested positive for H5N1 in states where the virus also has been found in dairy cattle. In cats—a species previously known to contract the virus, illness reportedly has been severe, manifesting as neurological signs, copious oculonasal discharge, and other respiratory signs, often progressing rapidly to death. These cases reinforce the importance of keeping pets away from raw milk or colostrum, raw meat (e.g., poultry), and wild birds and other wildlife. The CDC advises veterinary staff to take precautions when working in close contact with cats with confirmed or suspected exposure to the virus. Find more details on H5N1 in cats here.
- The National Veterinary Services Laboratories (NVSL) confirmed the detection of H5N1 in alpacas from a premises where HPAI-affected poultry were depopulated in May 2024. While this confirmation is not unexpected due to previous detection of the virus on the premises, the high amount of virus in the environment, and comingling of multiple livestock species on the farm, it is the first detection of H5N1 in alpacas.
- In November 2024, the NVSL also confirmed detection of H5N1 in two of five pigs in an Oregon backyard (noncommercial) farm where poultry and livestock were comingled, representing the first detection of the virus in U.S. swine. One of these pigs met the clinical case definition for HPAI H5N1. Poultry on the farm had been diagnosed with HPAI days earlier and were noted to share water sources, housing, and equipment with livestock. Results of viral genome sequencing suggested the animals likely contracted the virus through migratory birds rather than other livestock. The USDA stated that it has no concern about the safety of the nation's pork supply. Overall, the situation underscores the importance of strong biosecurity practices.
- Since the outbreak in dairy cattle began, infection with avian influenza virus type A (H5) has been confirmed in 67 people in the United States. Twenty-three of these cases involved poultry farm workers exposed to infected poultry in Washington (11 cases), Colorado (9 cases) and Iowa, Oregon, and Wisconsin (1 case each). Forty other cases involved dairy farm workers exposed to sick or infected cows —36 in California, two in Michigan, one in Texas, and one in Colorado. Reported symptoms in farm workers generally have ranged from eye redness or discharge (consistent with conjunctivitis) to more typical flu symptoms, such as fever, chills, coughing, and sore throat/runny nose. The CDC, which has been closely monitoring the situation, assures these human cases are unrelated to each other, with no indication of person-to-person transmission. Furthermore, there has been no uptick in human cases of flu. Based on the available information, the CDC continues to consider the risk of HPAI to the general public low.

- People with close or prolonged, unprotected exposure to infected animals or their environments are at greater risk of infection, and people with weak or compromised immune systems may be at risk for more severe illness. For tips on how to protect yourself, see the CDC's information for workers exposed to the virus and the USDA's recommendations on personal protective equipment. For tips on how to protect your workers, see the CDC's interim guidance for employers.

Impact on food safety

- The USDA, FDA, and CDC continue to state they have no concerns about the safety of the commercial milk supply because milk from impacted animals is being diverted or destroyed so it does not enter the human food supply. In addition, products are pasteurized before entering interstate commerce for human consumption.
- The FDA, alongside federal and state partners, continues to undertake research activities to help ensure the safety of the milk and milk product supply during the outbreak. A variety of retail dairy samples from multiple states have been tested for the virus, including pasteurized milk; pasteurized milk-based products, such as butter, ice cream, and various cheeses; and aged raw milk cheese. Although fragments of the H5N1 virus have been found in some samples, additional tests have shown the absence of live, infectious virus in those samples. Overall, the results indicate that pasteurization is effective in inactivating the virus, and reaffirm the FDA's assessment that pasteurized milk is safe for human consumption.
- In December 2024, the FDA also began sampling aged raw cow's milk cheese from warehouses and distribution hubs throughout the country to determine whether these products contain viable H5N1. If the FDA detects viable virus in a sample, the agency will take follow-up action as warranted to protect consumers.
- The USDA's Food Safety and Inspection Service (FSIS) has tested ground beef samples from stores in states with confirmed-positive dairy cattle herds. The samples tested negative for the virus using polymerase chain reaction (PCR) methods, reaffirming that the meat supply is safe.
- The FSIS also has tested 109 muscle samples from cull dairy cows that had been condemned at slaughter because of systemic disease. Overall, 108 samples tested negative for H5N1 viral particles, and one tested positive. Meat from condemned cows is prohibited from entering the human food supply, so the USDA remains confident that the meat supply is safe.
- To better understand the implications of H5N1 on beef destined for human consumption, the FSIS in September 2024 began testing dairy cows at slaughter as part of its existing national residue monitoring program. In the event of a positive test result, the USDA will work with industry to ensure the relevant carcass does not enter the food supply.
- The FDA recommends that states that permit the sale of raw milk (for human or animal consumption) within their state use their regulatory authorities to stop that sale if the milk may contain viable H5N1 virus, as may occur when the milk comes from an infected herd and is not pasteurized. In December 2024, all raw whole milk and cream from a California dairy was recalled following detection of the virus in multiple samples from retail stores and dairy storage and bottling sites. While no illnesses were reported, the finding emphasizes the risks of foodborne disease inherent to unpasteurized milk and milk products.
- The FDA strongly encourages that any milk diverted for feeding calves be heat treated to kill harmful bacteria or viruses before feeding.
- People are advised not to drink unpasteurized milk or eat unpasteurized milk-based cheese, and to properly handle and cook meat to an internal temperature of at least 165°F. This includes any meat used

to feed pets.

For the most current information and resources from the USDA, FDA, and CDC, see the USDA-APHIS page on HPAI detections in livestock.

Additional resources

USDA-APHIS

- Biosecurity best practices
- Resources on H5N1 in livestock
- National epidemiologic brief on H5N1 in dairy cattle
- Factsheet on HPAI dairy herd status program
- Clarifications concerning the April 24 federal order
- Case definition of HPAI H5N1 clade 2.3.4.4b in cattle
- Recommendations to minimize influenza transmission at dairy cattle livestock exhibitions
- Recommendations to protect farm workers
- Testing guidance for influenza A in livestock
- Information for small ruminant and camelid stakeholders

OTHER ORGANIZATIONS

- AABP: H5N1 dairy disease outbreak resources
- Avian influenza – control and prevention
- CDC: Key public health recommendations for preventing HPAI A(H5N1)
- FDA: Food safety and raw milk
- National Milk Producers Federation: H5N1 in dairy cattle
- Occupational Safety and Health Administration: Avian influenza – control and prevention
- World Organisation for Animal Health statement

CONTACTS

- APHIS Area Veterinarians in Charge
- Designated State Animal Health Officials
- Designated State Public Health Veterinarians
- National Animal Health Laboratory Network Laboratories

Avian influenza

Avian influenza appears periodically all over the world, including in the United States.

Avian influenza in pets and backyard flocks

Learn how avian influenza affects companion animals and backyard poultry, and how to prevent it from spreading.