Biosafety Considerations for Milk and Dairy Testing

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This document was developed in response to detection of highly pathogenic avian influenza *in dairy cows in 2024*

What We Know Today

As of April 24, 2024, the USDA Animal and Plant Health Inspection Service (APHIS) has confirmed through testing at the National Veterinary Services Laboratory (NVSL) that at least 28 dairy cow herds in eight states (TX, KS, NM, OH, ID, MI, NC, and SD) have been infected with a strain of highly pathogenic avian influenza (HPAI). FDA has no evidence of known risk to consumer health or the safety of the interstate commercial milk supply. CDC confirmed HPAI infection in one dairy worker who was diagnosed with conjunctivitis.

The Association of Public Health Laboratories (APHL) encourages public health laboratories to communicate with your state National Animal Health Laboratory Network (NAHLN) laboratory counterparts and state GRADE 'A' Milk Sanitation personnel or federal liaisons to these programs for questions around H5N1 testing within your state.

Whole Genome Sequence (WGS) analysis of virus from affected cattle performed to date at the NVSL shows the virus 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 since 2022 and has caused sporadic infections in several species of wild mammals and recently in neonatal goats in one herd (MN, 2024) in the United States.

Biosafety Considerations for Milk and Dairy Testing

While there is on-going work on characterizing the virus strain, its life cycle in cows and on the farm, and its behavior in milk samples, much remains unknown at this time. Laboratories receiving raw or pre-processed milk samples for testing should re-examine safety considerations of working with these and other cattle-derived samples. Consult the Biosafety in Microbiological and Biomedical Laboratories (BMBL) regarding the appropriate use of BSL2+ and BSL3 procedures. Raw milk is known to contain human pathogens, including *Salmonella, E. coli, Listeria, Campylobacter*, and *Brucella*, and should be handled with appropriate precautions in place.

An appropriate biosafety level for the specific procedures performed, including disposal of samples after testing is complete, should be determined in accordance with a biosafety risk assessment. Additional information on performing biosafety risk assessments and establishing effective biosafety containment is available in the BMBL manual. Relevant resources from CDC, OSHA, and FDA are referenced below.

USDA APHIS FAQ

Federal agencies, working with dairy farmers, state veterinarians, NAHLN laboratories, and the dairy product industry, continue to monitor for newly detected infections, analyze herd epidemiology data, gather information on transmission route(s), and confirm the safety of the US milk supply. A helpful FAQ document is updated by APHIS regularly.

Resources

- CDC and NIH Biosafety Recommendations for Work with Influenza Viruses Containing a Hemagglutinin from the A/goose/Guangdong/1/96 Lineage: https://pubmed.ncbi.nlm.nih.gov/23803973/
- OSHA Avian Flu Laboratory Worker Quick Card: https://www.osha.gov/sites/default/files/publications/lab_employees.pdf
- APHIS FAQ on HPAI in Dairy Herds: https://www.aphis.usda.gov/sites/default/files/hpai-dairy-faqs.pdf
- APHIS Guidelines for Avian Influenza Viruses (Pgs. 11 and 12) Guidelines for Avian Influenza Viruses (selectagents.gov)
- NAHLN Laboratories Approved to Conduct Avian Influenza Testing https://www.aphis.usda.gov/labs/nahln/approved-labs/iav-a
- FDA Milk Safety Programs Contacts: State GRADE 'A' Milk Sanitation Personnel https://www.fda.gov/food/federalstate-food-programs/milk-safety-programs-contacts-state-grade-milk-sanitation-personnel
- CDC Identification of Human Infection and Recommendations for Investigations and Response https://emergency.cdc.gov/han/2024/han00506.asp
- CDC Information for Health Professionals and Laboratorians (clinical specimens) https://www.cdc.gov/flu/avianflu/healthprofessionals.htm
- APHIS Detections of Highly Pathogenic Avian Influenza in Mammals https://www.aphis.usda.gov/livestock-poultry-disease/avian/avian-influenza/hpai-detections/mammals
- Cornell Animal Health Diagnostic Center on Testing Cattle for HPAI: https://www.vet.cornell.edu/animal-health-diagnostic-center/news/testing-cattle-highly-pathogenic-avian-influenza-hpai
- FDA Raw Milk Websites:
  The Dangers of Raw Milk: Unpasteurized Milk Can Pose a Serious Health Risk | FDA
  Raw Milk Misconceptions and the Danger of Raw Milk Consumption | FDA