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Highly Pathogenic Avian Influenza in Dairy Herds

The U.S. Department of Agriculture (USDA), the Centers for Disease Control and Prevention (CDC), and the Food and Drug Administration (FDA) confirmed a strain (H5N1) of highly pathogenic avian Influenza A virus (HPAI) in dairy herds in Texas and Kansas on March 25, 2024. To date, cases in dairy herds in Colorado, Idaho, Ohio, Michigan, New Mexico, North Carolina, and South Dakota also have been confirmed.

The Animal Health Protection Act (AHPA; 7 U.S.C. §8301 et seq.) provides USDA's Animal and Plant Health Inspection Service (APHIS) authorities to manage animal health. As of May 6, 2024, APHIS had reported that 34 dairy herds had been infected with HPAI. APHIS reports the number of infected dairy herds only, as all cows in a herd may not be tested once positives are confirmed. To date, HPAI has not been confirmed in beef cattle herds.

HPAI

The H5N1 strain of HPAI has a high mortality rate for domestic birds. The latest domestic outbreak of the H5N1 strain in wild birds was first detected in late 2021 and since has been found in most states. Infected wild birds shed the virus through mucus, saliva, and feces, leading to HPAI infection outbreaks in domestic commercial and backyard poultry flocks, as well as infections in other wildlife and marine mammals. According to CDC, 23 countries since 1997 have reported H5N1 infections in humans, mostly due to close exposure to infected poultry; only a small number of human cases have been reported since 2022. In 2022, one person involved in culling HPAI infected poultry tested positive for HPAI. On April 1, 2024, CDC confirmed that one person exposed to dairy cattle tested positive for HPAI. CDC considers the human health risk of HPAI to be low. However, the ability for Influenza A viruses to adapt and transmit to other species is cause for concern among both animal health and public health officials.

Dairy Cattle Symptoms

Unlike the high mortality caused by HPAI in domesticated poultry flocks, infected cows have been recovering in 10-20 days. HPAI in poultry flocks is controlled through culling of exposed flocks to eradicate the HPAI outbreak. Infected dairy cows are not culled to control the outbreak.

HPAI in dairy cattle initially showed up as an unexplained illness in dairy herds in Texas, then in Kansas and New Mexico, in February and March of 2024, respectively. The symptoms—drop in feed consumption, sudden decline in milk production, thick and discolored milk, tacky feces or diarrhea, and fever—were similar across herds. The illness primarily affected older dairy cows, not dry cows or heifers (i.e., cows not producing milk). Recently released research indicates that the HPAI virus may have been circulating in

dairy herds four months (i.e., since late 2023) prior to the USDA announcement.

APHIS Federal Order

On April 24, 2024, APHIS issued a federal order under Section 8305 of the AHPA, which allows USDA to restrict or prohibit the movement of animals in interstate commerce to protect animal health. The federal order requires testing of dairy cattle and negative results before they are moved interstate. The order went into effect on April 29, 2024, and requires

- dairy cattle to be tested for Influenza A by an approved National Animal Health Laboratory Network (NAHLN) laboratory;
- owners of herds with positive tests to provide epidemiological information, including movement tracing;
- dairy cattle moving interstate to follow APHIS conditions (see “APHIS Guidance”); and
- immediate adoption of the movement conditions for lactating dairy cows. Conditions for other classes of dairy cattle will be determined based on scientific factors and evolving risk profile.

The federal order also requires laboratories and state veterinarians to report positive Influenza A nucleic acid detection (e.g., polymerase chain reaction [PCR] or genetic sequencing) and serology diagnostic results to APHIS. The PCR test detects the presence of HPAI genetic material in samples but does not indicate whether the detected virus is active. Other tests can show the presence of active or live virus.

USDA clarified that the federal order applies to lactating dairy cows moving *interstate* only and not to other cows moving *intrastate*. Cows from various farms are often collected at sale barns or auctions and then moved to slaughter. If these cows are lactating and being moved interstate directly to a slaughter facility, the cows need only a Certificate of Veterinary Inspection confirming they are clinically healthy.

APHIS Guidance

On April 26, 2024, APHIS issued testing requirements for interstate movement and recommendations for state animal health officials, veterinarians, and producers.

Lactating dairy cattle must receive a negative Influenza A virus test result from an approved NAHLN laboratory using an approved test before they are moved interstate. Such

testing includes milk samples and nasal swabs collected by and supervised by an accredited veterinarian, state licensed veterinarian, or sample collector approved by state animal health officials. Milk samples are to be from each quarter of the udder. For groups of lactating dairy cows of fewer than 30 being moved, each cow must be tested. For larger groups, 30 of the cows must be tested. Tests must be done no more than 7 days prior to interstate movement.

The tests are completed by a NAHLN laboratory using an approved PCR test that detects the HPAI pathogen in fluids. Producers or those that submit samples to the laboratories do not pay for the testing; APHIS reimburses the laboratories for tests but does not pay for sample collection or shipping.

Lactating dairy cows are not eligible for interstate movement for 30 days from the most recent collection of any positive testing sample from any individual animal in the herd. After the 30-day period, animals must be tested again before movement. If an HPAI-positive lactating dairy cow needs to be moved to a premises in another state, the state animal health officials and APHIS must agree to the specific circumstances.

APHIS recommends that cattle movement be minimized; not be moved if there are any signs of HPAI; and once moved, be isolated for 30 days to minimize the spread of infection. APHIS also states that cattle producers need to follow any additional state cattle movement requirements. In addition, producers are encouraged to follow biosecurity procedures to reduce the potential spread of the virus.

USDA Testing

The NAHLN is a key component for managing this disease event. NAHLN is a network of 63 federal, state, and university veterinary diagnostic laboratories in 42 states that test for foreign animal diseases, including avian influenza. NAHLN personnel work with APHIS's National Veterinary Services Laboratory (Ames, IA, and Plum Island, NY) on diagnostic testing and surveillance of animal disease.

In the case of dairy herd infections with H5N1, APHIS announced that the NAHLN laboratories will be reimbursed for (1) testing suspect dairy cattle, (2) pre-movement testing, (3) tests requested by producers of asymptomatic cattle, and (4) testing of samples from other animals on dairies with HPAI infections.

FDA Milk Safety

FDA is responsible for the safety of the U.S. milk supply. Almost all commercial milk is produced under the Grade "A" Pasteurized Milk Ordinance (PMO) that regulates milk safety and sanitary conditions of milk facilities. The PMO specifies that milk from sick dairy cows should not enter the milk supply.

FDA has concluded that the PMO and the pasteurization of milk kills the H5N1 virus, making the milk safe for consumption. Initial FDA PCR tests of milk found that 20% of commercial milk samples contained viral HPAI fragments, with more positive results in areas with infected

herds. FDA found no live virus in follow-up testing, leading it to conclude that pasteurization effectively deactivates HPAI virus. FDA also tested infant and toddler formula and found no viral fragments. FDA expanded testing to other retail dairy products (cottage cheese and sour cream), as well as fluid milk, and found no live HPAI virus.

H5N1 virus can be transferred to young calves through raw milk. FDA recommends that milk from cows showing signs of HPAI be discarded. The discarded milk should be heat treated to kill the virus before being dumped in a lagoon or spread as waste solid to prevent infection of other animals. If used to feed calves or other farm animals, such as farm cats, it should also be heat treated similarly to the commercial pasteurization process to kill the virus.

FDA is testing raw milk sent to processors to understand the H5N1 virus load in milk. At this time, FDA has limited information about the transmission of HPAI in raw milk. FDA has a long-standing recommendation that raw milk and raw milk dairy products not be sold or distributed for human consumption because of the transmission of pathogens in raw milk.

USDA Beef Studies

At the end of April, USDA reportedly started sampling ground beef from retail stores in the states with confirmed HPAI dairy cattle. Dairy cow beef is a key input into the U.S. ground beef supply because it is lean and combined with fed cattle beef with higher fat content to create the lean ground beef demanded by U.S. consumers. USDA's Food Safety and Inspection Service (FSIS) announced on May 1, 2024, that all 30 of its retail ground beef samples tested negative for any viral particles.

FSIS is collecting muscle samples from culled dairy cows condemned at slaughter facilities for systemic pathologies. APHIS plans to test the samples for viral particles and post the results when available.

USDA's Agricultural Research Service is conducting studies to evaluate how a HPAI virus surrogate is affected by different cooking temperatures of ground beef. USDA plans to report these results when they are available.

According to FSIS, Colombia is the only country that has banned beef shipments from the nine states with HPAI infected dairy herds. Thus far, other U.S. beef trading partners have not imposed any restrictions.

Impact on Dairy Industry

To date, there has been little impact on dairy markets. One initial analysis indicates a minimal impact on milk production and markets. According to USDA statistics, there are 9.4 million dairy cows in the United States, producing about 226 billion pounds of milk annually. In 2023, USDA reported that there were 26,290 licensed dairy herds (commercial operations) in the United States producing a majority of the milk. About 0.1% of dairies have been affected by the current HPAI outbreak to date.

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