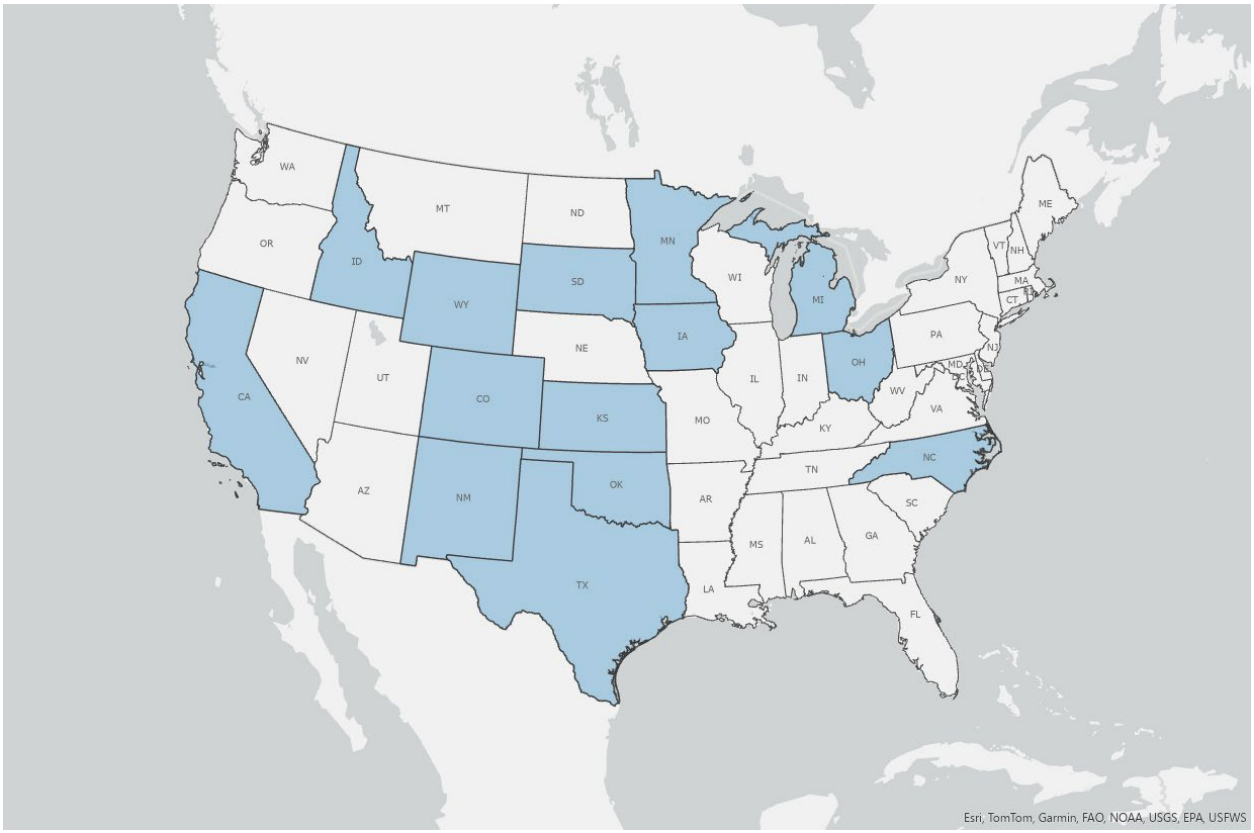
USDA Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Status and Analyses of HPAI-affected Livestock Herds
September 30, 2024 Report



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For more information, contact:

Sarah Blasko
Acting Director, Center for Epidemiology and Animal Health (CEAH)
Alan R. Huddleston, VMD
Director, Center for Epidemiology and Animal Health (CEAH)
USDA–APHIS–Veterinary Services
Email: vs.ceah@usda.gov
Web: https://www.aphis.usda.gov/livestock-poultry-disease/epidemiology

USDA–APHIS–VS-S&P–CEAH
NRRC Building B, M.S. 2W4
2150 Centre Avenue
Fort Collins, CO 80526-8117

Email: vs.ceah@aphis.usda.gov
https://www.aphis.usda.gov/livestock-poultry-disease/epidemiology

(September 30, 2024)

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EXECUTIVE SUMMARY

The USDA's Animal and Plant Health Inspection Service (APHIS) announced the first detection of highly pathogenic avian influenza (HPAI) in domestic livestock on March 25, 2024. Samples of unpasteurized milk and oropharyngeal swabs collected from sick dairy cattle on a farm in Texas tested by members of the National Animal Health Laboratory Network (NAHLN) were followed by detections in Kansas on March 26, 2024. The USDA APHIS Veterinary Services National Veterinary Services Laboratories (NVSL; National Centers for Animal Health in Ames, Iowa), confirmed HPAI H5N1 clade 2.3.4.4b (H5N1), genotype B3.13 on these dairies. Whole genome sequencing and epidemiological data indicate the first detection in livestock is linked to a spillover event from migratory birds to dairy cattle. The virus moved between dairies, and in some instances, spilled over from dairy farms to poultry premises. As of September 30, 2024, no other infected cattle had been linked to migratory birds. This report includes data collected from March 25, 2024 through September 30, 2024.

Since the initial livestock detection on March 25, 2024, genotype B3.13 has also been identified in peridomestic mammals and non-migratory birds, and phylogenetic analyses indicate these species are seeing spillback *from* infected premises. There is currently no evidence that the virus is being introduced into dairy premises by these species.

Cattle movement and less stringent biosecurity practices are significant factors in disease transmission among livestock and across the States; as of September 30, 2024, the total confirmed detections for the domestic livestock incident include 243 dairy cattle premises in 14 States: California, Colorado, Idaho, Iowa, Kansas, Michigan, Minnesota, New Mexico, North Carolina, Ohio, Oklahoma, South Dakota, Texas, and Wyoming.

While the introduction of H5N1 in dairy cattle was caused by an initial spillover event from migratory waterfowl, further virus spread is linked to both direct and indirect transmission. After the first introduction of H5N1, disease spread occurred with direct transmission when nonclinical cattle—cattle with no visible symptoms—were moved from an infected premises to an uninfected premises. However, as live cattle movement prior to detection was only reported in 58 percent of infected farms surveyed, other modes of transmission are suspected.

Potential indirect virus transmission routes include visitor and employee movements onto the farm. The frequency of visitors (e.g., veterinarians, feed delivery personnel, hoof trimmers) to a premises is a potential risk factor for spread of H5N1. Dairy workers are also a potential source of disease introduction and spread. Other potential sources include moving cattle using shared, unwashed vehicles; using the same equipment to handle manure and feed; or presence of peridomestic animals with access to cattle, feed, and bedding. Waste milk and manure management are also important factors when considering the risk of disease spread on premises.

Infected cattle may or may not have clinical signs and the virus is predominantly found in milk and mammary tissue, regardless of observed signs. The most commonly reported

clinical signs of H5N1 in livestock were decreased milk production, decreased feed consumption, and production of abnormal milk. Of those cows with abnormal milk, the most common characteristics reported were thickened milk and yellow discoloration. Other common clinical signs included fever, dehydration, and decreased rumen motility. Respiratory signs were also noted, including increased respiratory rate, nasal discharge, labored breathing, and pneumonia.

In an effort to reduce the spread of H5N1, on April 24, 2024, APHIS issued the Federal Order Requiring Testing for and Reporting of Highly Pathogenic Avian Influenza (HPAI) in Livestock. Mandatory premovement testing for lactating dairy cattle moving between States and mandatory reporting of positive influenza A test results in livestock to APHIS are now required, and movement is restricted for a minimum of 30 days for herds with positive test results. On June 3, 2024, APHIS initiated a voluntary HPAI Dairy Herd Status Program. This program, which is available to producers, aims to ease the burden of premovement testing for unaffected herds, reduce virus dissemination, and provide additional testing for nonclinical dairy herds. It is also a means to provide technical consultation for producers.

To better understand virus transmission and clinical signs in livestock, APHIS gathered epidemiological survey information directly from producers. APHIS also performed a spatial analysis specifically for herds in Colorado to examine the relative risk of infection between farms, and performed wildlife surveillance in birds, rodents, and other animals found on or near impacted dairies throughout the country. The material presented in this report includes ongoing research and analysis that will help stakeholders understand the risk factors of disease transmission in cattle, common clinical signs of the disease, the impact on wildlife surrounding impacted dairies, and the extent of the outbreak so far. Subsequent reports will include additional data, analyses, and program summaries. In the interim, the USDA–APHIS Detections of Highly Pathogenic Avian Influenza (HPAI) in Livestock webpage provides up-to-date information.

The preliminary data from the epidemiologic questionnaire sent to producers and spatial analyses exploring risk of disease spread between neighboring farms are discussed within this report; however, it is imperative to stress that adherence to the Federal Order and biosecurity principles are key to mitigating the risk of continued disease spread between livestock. A solid biosecurity plan can greatly reduce the risk of disease transmission and help protect American dairy cattle.

INTRODUCTION

A. Description of HPAI H5N1 Disease Event in Livestock and Timeline of Key Events

On March 25, 2024, the USDA's NVSL confirmed the first detection of HPAI H5N1 clade 2.3.4.4b (H5N1), genotype B3.13, in a Texas dairy herd. NVSL characterized the virus as highly pathogenic per the World Organisation for Animal Health (WOAH).[1] Whole genome sequencing and epidemiological data indicate the livestock event is linked to an initial spillover event from migratory birds to dairy cows.

Once in dairy cows, the virus spread from farm to farm, and in some instances, from dairy farm to poultry premises.[2] Subsequent and continued disease spread among livestock and across States involves an interconnected web of causes, with animal movement and less stringent biosecurity practices being significant risks of disease transmission. Between March 25, 2024 and April 24, 2024, the USDA confirmed H5N1 clade 2.3.4.4b virus detections on 33 dairy cattle premises in 8 States: Kansas, Idaho, Michigan, New Mexico, North Carolina, Ohio, South Dakota, and Texas. The USDA also confirmed, based on specific phylogenetic evidence and epidemiological information, that eight poultry premises in five States—Kansas, Michigan, Minnesota, New Mexico, and Texas—were also infected with the same H5N1 virus (genotype B3.13) detected in dairy cattle.

On April 24, 2024, APHIS issued the Federal Order Requiring Testing for and Reporting of Highly Pathogenic Avian Influenza (HPAI) in Livestock.[3] This order requires mandatory premovement testing for lactating dairy cattle moving interstate and requires mandatory reporting of positive influenza A test results in livestock to APHIS. Herds with positive H5N1 test results are restricted from movement for a minimum of 30 days. The Federal Order was an initial effort to reduce the risk of further spread of H5N1. As part of the Federal Order, APHIS declared it would provide reimbursement for testing at NAHLN[4] laboratories, including samples submitted for dairy cattle suspected of disease due to clinical signs, premovement testing, producers interested in the disease status of their asymptomatic animals, and samples taken from other animals on dairies associated with this disease event.

In April 2024, APHIS initially published further guidance to help safeguard the health of U.S. livestock and poultry, keep the food supply safe, and protect the industry. The document, *APHIS Requirements and Recommendations for Highly Pathogenic Avian Influenza (HPAI)*

[1] Avian Influenza - WOAH - World Organisation for Animal Health
[2] The terms premises, dairy, farm, and operation have been used interchangeably in this document to refer to dairy farms.
[3] Federal Order Requiring Testing for and Reporting of Highly Pathogenic Avian Influenza (HPAI) in Livestock (usda.gov)
[4] NAHLN is a nationally coordinated partnership of Federal, State, and university-associated animal diagnostic laboratories. The laboratorians are trained and proficiency tested by NVSL to perform official Federal animal health testing. The network provides ongoing disease surveillance, responds quickly to disease events, communicates diagnostic outcomes to decision makers, and has the capability and capacity to meet diagnostic needs during animal disease outbreaks.

H5N1 Virus in Livestock for State Animal Health Officials, Accredited Veterinarians and Producers, is shown in Appendix C. It outlines the interstate movement requirements of cattle, highlighting sample collection and testing for interstate premovement testing of lactating dairy cattle and cattle moved directly to slaughter and the requirements for certificates of veterinary inspection. It also details APHIS recommendations for cattle movement, biosecurity recommendations for H5N1 in livestock, and considerations for State Animal Health Officials, Accredited Veterinarians, and producers. Additionally, it touches on milk safety, stressing the concept of One Health agriculture and public health coordination.

In May 2024, APHIS announced financial assistance options to help producers enhance their biosecurity practices, offset costs associated with heat treatment of waste milk, collect and ship samples, provide veterinary care for affected cattle, and protect their employees with personal protective equipment (PPE). In June 2024, the USDA's Farm Services Agency began offering reimbursement for milk losses to producers affected by H5N1.

On June 3, 2024, APHIS initiated the HPAI Dairy Herd Status Program.[5] This program aims to ease the burden of premovement testing for unaffected herds, reduce virus dissemination, provide additional testing to dairy herds, expand knowledge of the disease, offer technical guidance to producers, and support the national strategy to monitor and control the virus in dairy herds. The HPAI Dairy Herd Status Program is a voluntary program that can establish a Monitored Unaffected herd status over three to four consecutive weeks of negative bulk milk testing for H5N1 at a NAHLN laboratory. The timeline is dependent upon whether the herd has been previously confirmed with the disease (four weeks) or not (three weeks).

Continued participation in the Dairy Herd Status Program with weekly bulk tank sample testing with negative results will allow the herd to maintain a Monitored Unaffected status. Lactating cattle from the herd can then be moved across State lines without the additional individual animal premovement testing currently required by the April Federal Order. Herds not enrolled in the program will continue to be required to follow the interstate testing and movement requirements published in the April Federal Order.

B. Summary of Confirmed H5N1 Livestock Detections by State

As of September 30, 2024, the total confirmed detections for the domestic livestock incident include 243 dairy cattle premises in 14 States: California, Colorado, Idaho, Iowa, Kansas, Michigan, Minnesota, New Mexico, North Carolina, Ohio, Oklahoma, South Dakota, Texas, and Wyoming.

Figure 1 depicts the epidemiological curve of H5N1 in livestock from March 25, 2024 through September 30, 2024. The horizontal axis (x-axis) shows the date, and the vertical axis (y-axis) shows the number of H5N1 confirmed dairy premises.

[5] Dairy Herd Status Program | Animal and Plant Health Inspection Service

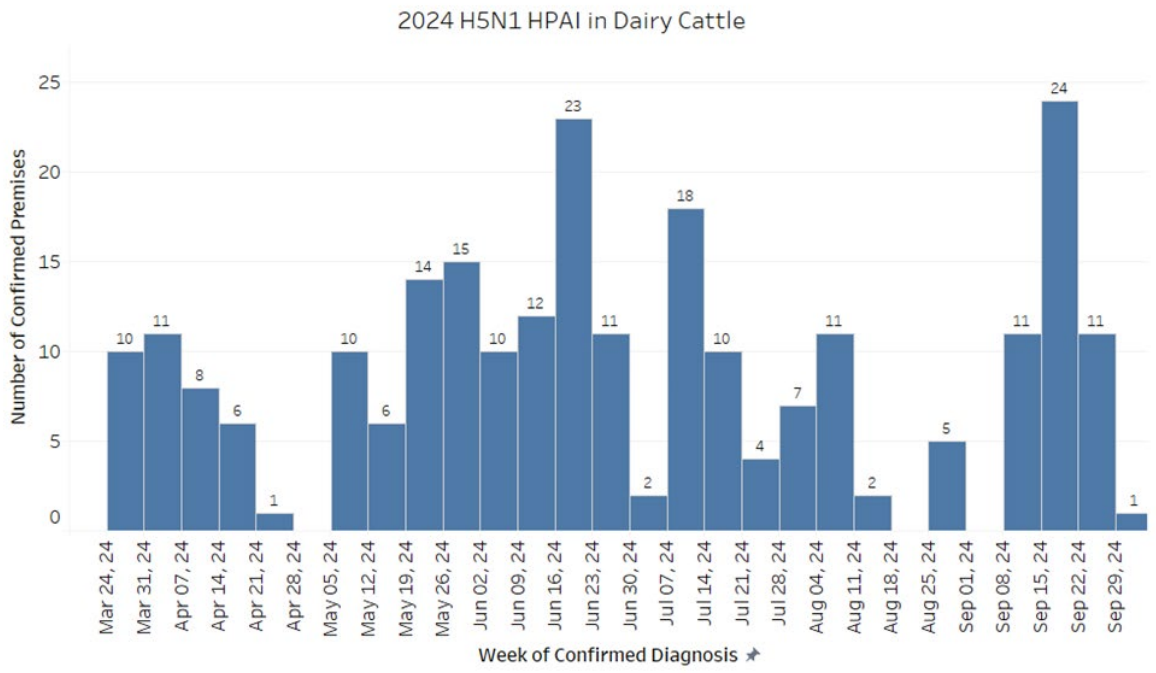


Figure 1. HPAI livestock epidemiological curve March 25, 2024 to September 30, 2024 (243 confirmed premises).

After the initial event detection in Texas on March 25, 2024, followed a day later by Kansas, 11 states reported detections between the end of March and the middle of July. The fourteenth State, California, confirmed the first case of H5N1 on August 30, 2024. Current information about confirmed detections of HPAI in livestock can be found on the USDA–APHIS website.

Table 1 summarizes the number of confirmed dairy premises by State between March 25, 2024 and September 30, 2024 and lists the date each State confirmed its first positive premises. This table does not include one alpaca in Idaho that tested positive on May 16, 2024 for the B3.13 genotype. All cases included in the table are dairy milking cows. As seen in Figure 2, a heat map showing affected States, Colorado had the greatest number of confirmed premises with 64 as of this report's data cutoff of September 30, 2024.

Table 1. Number of confirmed detections of HPAI in livestock by State and by date of first detection.

State	First Date of HPAI Confirmation per Affected State	# of Confirmed Detections per State as of September 30, 2024
Texas	March 25, 2024	26
Kansas	March 26, 2024	4
Michigan	March 29, 2024	29
New Mexico	April 1, 2024	9
Ohio	April 2, 2024	1
Idaho	April 2, 2024	33
South Dakota	April 9, 2024	7
North Carolina	April 9, 2024	1
Colorado	April 25, 2024	64
Minnesota	June 5, 2024	9
Wyoming	June 5, 2024	1
Iowa	June 7, 2024	13
Oklahoma	July 11, 2024	2
California	August 30, 2024	44
14 States		243

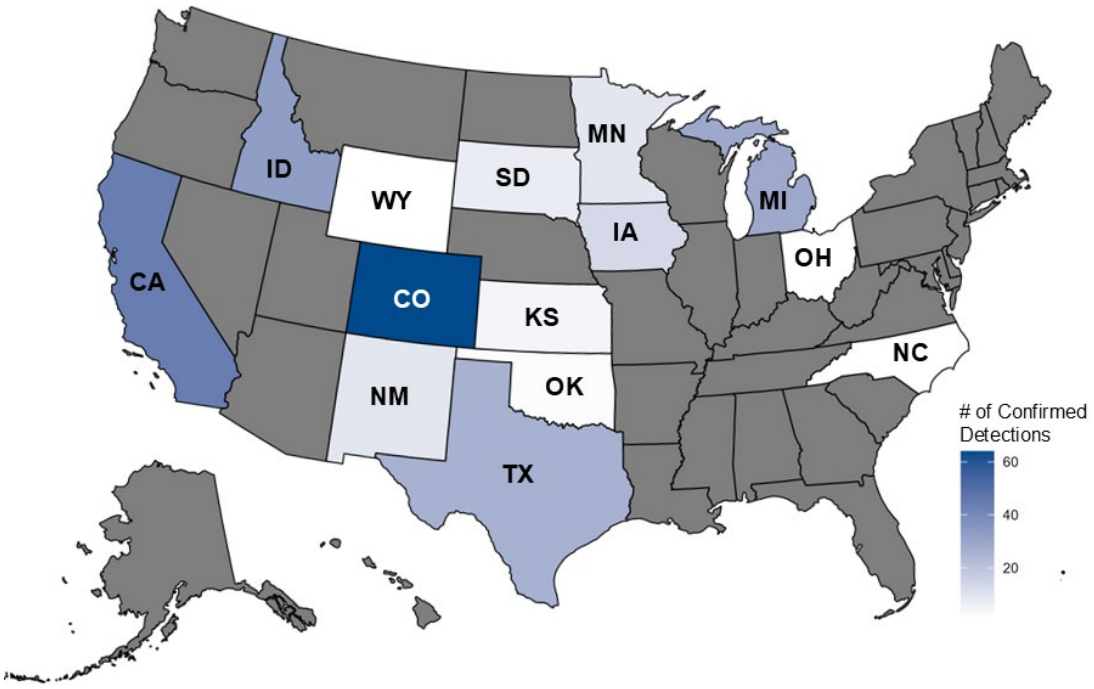


Figure 2. Heat map of the United States showing number of confirmed HPAI livestock positive detections as of September 30, 2024.

C. Role of Animals and Milk in Disease Spread

It is important to note that other species that may be present on farms can become infected with H5N1 and display clinical signs that may vary from that of livestock. Genotype B3.13 has been detected in peridomestic birds and mammals[6]; phylogenetic and temporal analysis indicates this is spillback into these species *from* infected farms—there is currently no evidence to support virus being introduced into farms by the peridomestic birds or mammals.

Notably, there have been many cats affected on H5N1 positive farms, likely via ingestion of raw milk. Many mortalities and disappearances have been reported. Although there is currently no evidence that wild or peridomestic birds are introducing H5N1 to livestock herds, these birds can be infected from the livestock and may also serve as infection sources for cats.

It is important to note that raw milk from recently affected dairy cows contains a high viral load of HPAI; therefore, there is a risk of disease transmission through unpasteurized milk. Proper treatment of raw waste milk prior to feeding to calves or other species is recommended. Raw waste milk should also be properly disposed of to avoid infecting other animals. FDA studies have confirmed pasteurized milk and dairy products are safe.[7]

D. HPAI Disease Event in Poultry

The HPAI poultry outbreak that began in 2022 continues to impact commercial and backyard poultry flocks across the United States, with 48 affected States since January 2022. The USDA continues to update and share information, such as epidemiologic, genetic, and wildlife investigations. This information is working to provide a better understanding of factors associated with avian influenza virus transmission.[8]

Disease is more easily recognized in poultry due to faster, obvious increases in morbidity and mortality. Clinical signs also differ between poultry and livestock.

The main clinical signs of poultry include the following:

- Sudden mortality without any prior symptoms of illness
- Lack of energy and appetite
- Drop in egg production or soft-shelled, misshapen eggs
- Swelling of the eyelids, comb, wattles, and shanks
- Purple discoloration of the wattles, comb, and legs
- Gasping for air (difficulty breathing)
- Nasal discharge, coughing, sneezing

[6] HPAI Detections in Mammals
[7] Questions and Answers Regarding Milk Safety During Highly Pathogenic Avian Influenza (HPAI) Outbreaks | FDA
[8] Avian Influenza | Animal and Plant Health Inspection Service

- Diarrhea

E. Scope of September 30, 2024 Livestock Status Report

In response to the H5N1 disease event in livestock across the United States, APHIS Veterinary Services, Wildlife Services, and affected States initiated epidemiologic, laboratory, and wildlife investigations. These surveys and data analyses will help provide a better understanding of disease transmission risk factors in livestock.

These investigations include the following:

- A case series study to investigate H5N1 virus in dairy cattle
- Phylogenetic analysis and diagnostics, including GenoFLU Tool Classification
- Spatial analysis
- Dairy Herd Status Program overview
- Overview of targeted trapping and sampling of wildlife by APHIS Wildlife Services near or on impacted dairies
- Summary of findings from wildlife surveillance in trapped birds, rodents, and other animals found on or near dairies

More detailed and technical information may be found in the individual sections labeled in the Table of Contents.

F. Additional USDA Support

USDA has supported the HPAI livestock event with financial backing and by deploying epidemiology support teams. There are also resources available to help farmers develop biosecurity plans and practices.

Financial Support

One of the ways USDA–APHIS is helping farmers includes providing financial support[9] for PPE, biosecurity planning, milk treatment, veterinary costs, sample shipping, and milk loss indemnities.

Milk loss offset is part of the Farm Service Agency's Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program (ELAP). This is an indemnity program that compensates producers with herds that have tested positive for H5N1.[10]

Epidemiology Support Teams

Epidemiology support teams deployed to Michigan, Iowa, Minnesota, Colorado, and California to support field investigations and to collect and analyze data to learn more

[9] USDA Support Options for Dairy Herd Producers
[10] Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish (ELAP) | Farm Service Agency

about H5N1 in dairy cattle. Data sources include questionnaires, test results from on-farm sampling, and production and movement records.

Research Support

USDA is investing in research through the Agricultural Research Service's National Institute of Food and Agriculture, as well as partnerships with academia and other organizations. Funding may be available for research opportunities for HPAI vaccine research, development, and evaluation. The current focus of research is viral pathogenesis and transmission and the development of diagnostics for H5N1 in dairy cows.

HIGHLY PATHOGENIC AVIAN INFLUENZA DETECTIONS IN LIVESTOCK– A CASE SERIES STUDY TO INVESTIGATE THE H5N1 VIRUS IN DAIRY CATTLE

A. Background

HPAI H5N1 clade 2.3.4.4b was confirmed in dairy cattle in Texas on March 25, 2024.[11] This confirmation was made following reports in multiple States of a syndrome occurring in lactating dairy cattle that resulted in a sudden drop in milk production. Following the initial detection, additional cases have been identified, and as of September 30, 2024, HPAI H5N1 clade 2.3.4.4b has been confirmed on 243 dairy cattle premises in 14 States.

In response to this novel and evolving event, USDA–APHIS is conducting a case-series study of H5N1-infected dairy cattle operations in the United States. The objectives of this study are to better understand the emerging health event in dairy cattle, explore potential risk factors for infections in dairy cattle, and identify specific topics for future follow-up studies. The descriptive information collected in the case series will be used to improve our knowledge of transmission and on-farm practices, to inform biosecurity and preventive measures, and to generate hypotheses for more in-depth analysis.

B. Methods

Farms eligible for inclusion in the case-series study met the USDA case definition.[12] All dairies detected as infected with H5N1 during the event were eligible to be included in the USDA–APHIS study; however, inclusion was dependent upon completion of a USDA-developed epidemiological questionnaire. The 22-page questionnaire was developed and administered to farm owners or managers by Federal or State veterinary medical officers or completed by self-administration on each participating farm as a fillable PDF. A copy of the questionnaire is available in Appendix A.

The questions focused on herd characteristics, management practices, milking procedures, animal movements, environmental factors, wildlife, wild birds, and clinical signs and disease progression on-farm. Many questions asked about practices during a “30-day reference period,” defined as the 30 days prior to the date that clinical signs were first observed on the farm.

Data collection started as early as April 5, 2024 and is ongoing. Fillable PDF forms were uploaded to the USDA Veterinary Service’s Emergency Management Response System (EMRS) and data were then extracted to a secure APHIS location. EMRS is a web-based application for the reporting of routine investigations of foreign animal diseases, State specific disease outbreaks, surveillance and control programs, and other emergency

[11] Federal and State Veterinary, Public Health Agencies Share Update on HPAI Detection in Kansas, Texas Dairy Herds | Animal and Plant Health Inspection Service
[12] https://www.aphis.usda.gov/sites/default/files/hpai-livestock-case-definition.pdf

responses involving animals. The analysis reported here includes completed surveys that were uploaded to EMRS by September 30, 2024.

Following extraction, questionnaire responses were validated using R, a programming language for statistical computing and data visualization, to identify logical inconsistencies in the data. Validation identified improper categorical responses and erroneous skip pattern. Two analysts performed relational checks, evaluated the identified errors, and upon agreement by both analysts, implemented appropriate corrections, including deducting responses. When errors occurred, the analysts made notes in the questionnaire or cross-checked them using EMRS information and/or State-administered questionnaires.

C. Results

A total of 144 USDA–APHIS questionnaires were completed across 14 States by the September 30, 2024 cut-off for this report (Table 2), representing 62 percent of confirmed premises. The numbers of completed questionnaires by the date of confirmed diagnosis by NVSL are depicted in Figure 3. Completeness of responses varied, but an effort was made to validate and include all data collected in questionnaires in the analysis. Premises answering only State-designed epidemiological questionnaires were excluded to ensure all respondents were presented with the same series of questions and to maintain consistency in data reporting. Surveys completed after September 30, 2024 for confirmed premises were excluded from this report but will be included in a final report.

Table 2. Completed USDA–APHIS questionnaires entered into EMRS and included in this report and total numbers of NVSL-confirmed positive dairy premises, by State as of September 30, 2024.

State	Total USDA–APHIS Questionnaires	Total Premises Confirmed Positive
California	19	44
Colorado	62	64
Idaho	3	33
Iowa	11	13
Kansas	0	4
Michigan	27	29
Minnesota	9	9
New Mexico	0	9
North Carolina	1	1
Ohio	1	1
Oklahoma	0	2
South Dakota	3	7
Texas	8	26
Wyoming	0	1
	144	243

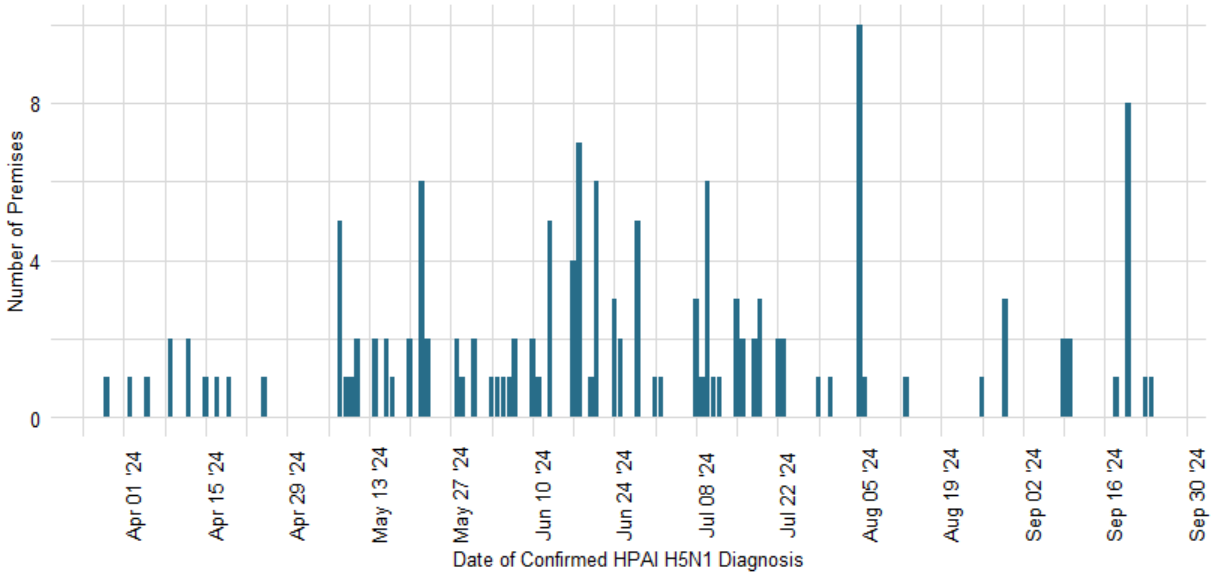


Figure 3. Numbers of completed USDA–APHIS dairy epidemiological questionnaires included in this report by date of confirmed H5N1 diagnosis by the NVSL (Ames, Iowa, United States).

D. Herd and Clinical Description

The median herd size was approximately 2,400 cattle (range: 151–12,600) and the median number of lactating cows was 1,580 (range: 150–9,980). Clinical signs were observed on 135 of 144 premises; 9 premises were identified through State-level surveillance programs or contact tracing and were reported as non-clinical at the time of survey completion. The median time from the onset of clinical signs to the initial diagnosis was 7 days (range: -7–50); the negative time interval reflects premises identified via enhanced surveillance prior to the onset of clinical signs (n = 7).

Figure 4 summarizes clinical signs reported by respondents: the most frequently observed signs were decreased milk production (129 out of 144), decreased feed consumption (121 out of 144), abnormal milk (119 out of 144), fever (105 out of 144), dehydration (101 out of 144), and decreased rumen motility (94 out of 144). The median reported duration of clinical signs for affected cattle was 5 days (range: 3–21); however, at the time of questionnaire administration, most premises still had clinical cows, which may bias this result. Specific abnormal milk characteristics that were reported included thickened milk (107 out of 144) and yellow discoloration (101 out of 144) and are shown in Figure 5.

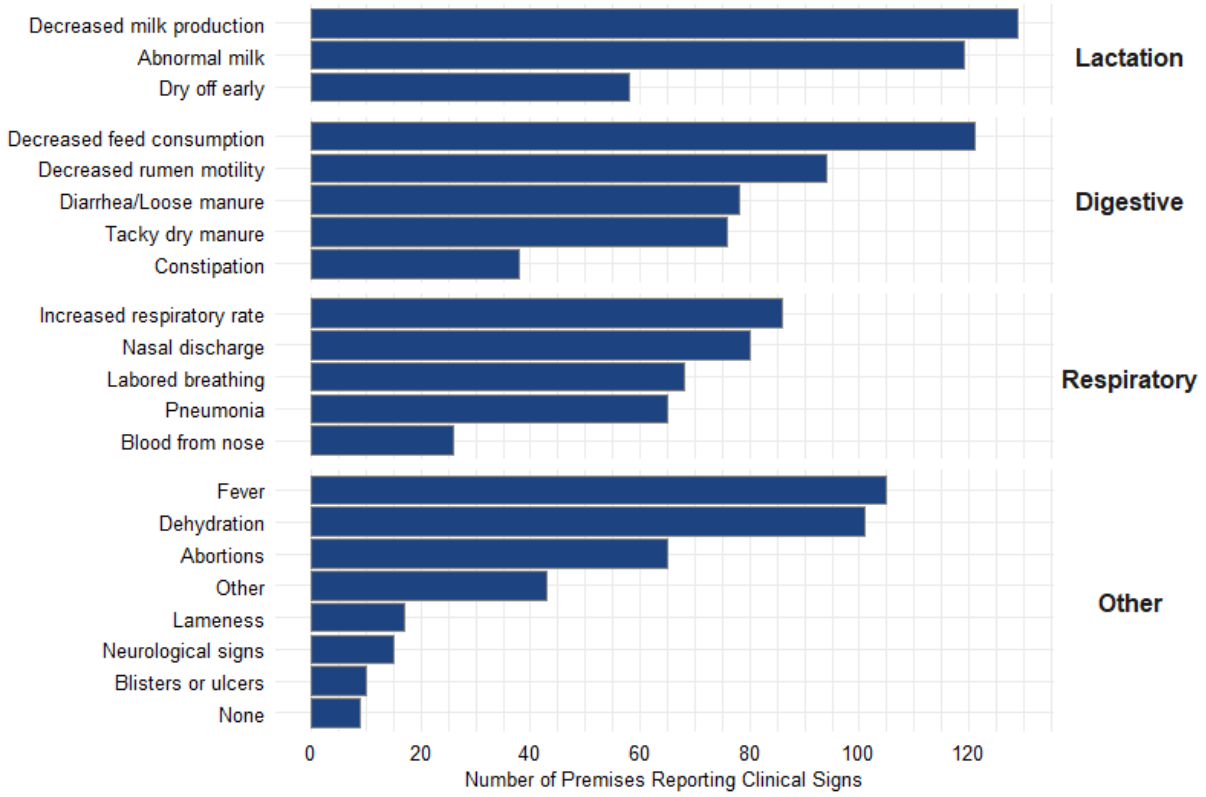


Figure 4. Numbers of H5N1-positive dairy premises that reported observing the listed clinical signs among dairy cattle.

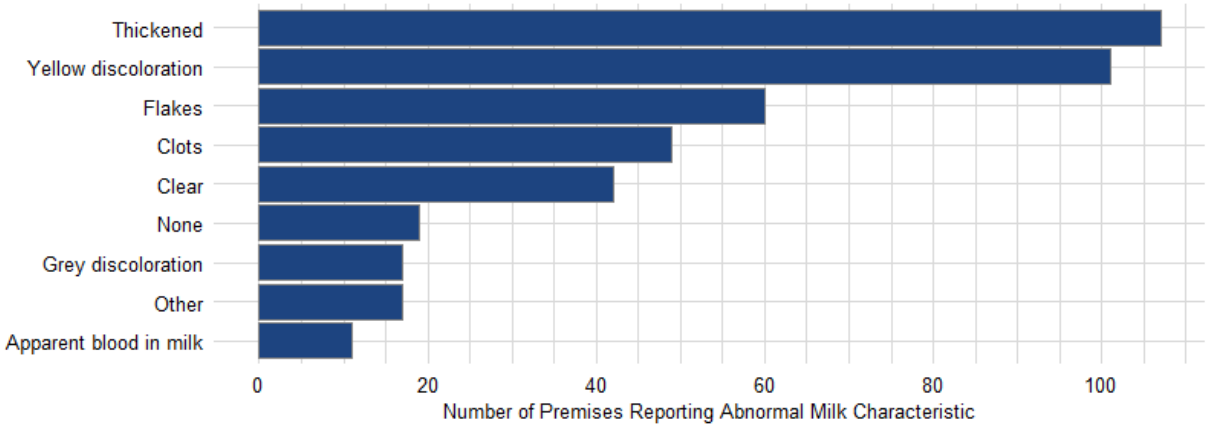


Figure 5. Numbers of H5N1-positive dairy premises that reported observing the listed abnormal milk characteristics among lactating dairy cattle.

The questionnaire also included questions about other animal types present on the operation during the 30-day reference period, and if any of those animals had been sick or died (Figure 6). The most common other animal type reported on dairy premises was cats, and 38 percent of those premises (35 out of 92) reported observing sick or dead cats during

the 30-day reference period. Of the 38 percent of premises reporting sick or dead cats, 31 percent (11 out of 35) reported feeding waste milk to cats or dogs during the 30-day reference period. Among premises reporting having chickens or other poultry, 17 percent (4 out of 24) reported sick or dead birds during the 30-day reference period. One premises each for both dogs and beef cattle responded “Yes” to the question asking if any of that animal type were sick or died, but no context was provided.

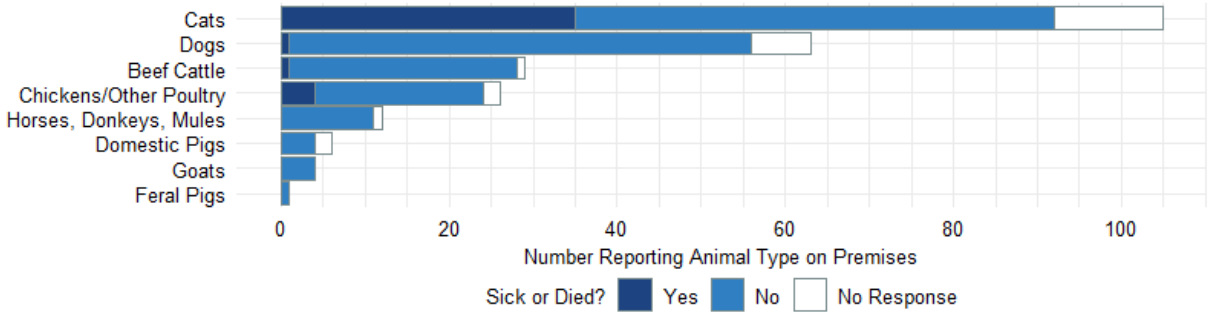


Figure 6. Numbers of H5N1-positive premises that reported other animal types present and other animal types sick or dead on the premises during the 30-day reference period.

E. Potential Routes of Infection

A main objective of the questionnaire was to identify potential routes of virus introduction for this emerging animal health event. Several series of questions were dedicated to describing live animal movements onto the premises (direct transmission) and potential routes of introduction, including via visitors or workers and wild birds or mammals (indirect transmission).

Live Animal Movements

Early spread of H5N1 between dairy premises was linked to the movement of asymptomatic cattle from infected premises (Nguyen et al., 2025). However, among the questionnaires analyzed, introduction of live cattle during the 30-day reference period was only reported for 58 percent (83 out of 143) of premises, suggesting that other routes of infection also play a substantial role in disease spread. The most reported live animal movement onto premises was bred heifers (32 out of 83), followed by lactating cows (31 out of 83), fresh heifers (18 out of 83), weaned heifers (17 out of 83), dry cows (15 out of 83), and calves (7 out of 83).

Given the interest in how premises without live animal movements are becoming infected, several of the following analyses show the response data split by premises that reported live animal movements onto the premises (n = 83), versus premises that did not report any live animal movements onto the premises during the 30-day reference period (n = 60). The herd sizes for these two groups were not significantly different (Kruskal-Wallis rank sum test, p = 0.9028); the median herd size for premises reporting

movements on was approximately 2,460 (range: 224–9821), compared to 2,270 (range: 151–12,600) that did not report movements on during the 30-day reference period.

Visitors and Employees

Human movements via farm visitors and personnel have been identified as risk factors for indirect disease transmission in previous animal disease outbreaks. The questionnaire included several questions focused on the 30-day reference period to collect information on visitor types, frequency of visits to the operation, and if visitors had physical contact with cattle (Table 3). As anticipated, given the management and operations of the dairy industry, visitors were commonly reported. Frequently reported visitor types included milk haulers, feed delivery personnel, veterinarians, nutritionists or feed consultants, and contract haulers (e.g., cattle or manure haulers). Examples of "Other" visitor types more commonly mentioned by respondents included milk technicians, semen distributors, and supply vendors.

Table 3. Reported visitors, number of visits, and reported physical contact with cattle, by visitor type during the 30-day reference period.

Visitor Type	Number Reporting Visitors	Visit Frequency[a]	Number Reporting Contact with Cattle[b]
Veterinarian	131/143	4 (1–30)	127/130
Nutritionist or Feed Consultant	124/142	2 (1–8)	61/119
Breeding Technician	68/139	30 (1–30)	67/67
Feed Delivery Personnel	134/143	20 (1–210)	3/129
Milk Hauler	138/143	30 (14–240)	5/128
Contract Hauler Driver or Vehicle	94/141	5 (1–120)	53/83
Renderer	90/139	12 (1–40)	29/83
Hoof Trimmer	77/134	4 (1–12)	70/71
Other1	37/67	4 (1–30)	14/36
Other2	19/129	4 (1–12)	6/17

[a] Median (range) frequency was only reported for questionnaires indicating visitor type on premises during the 30-day reference period.

[b] Denominator reflects number of questionnaires that reported the visitor type and answered the contact question.

The total number of visitors was also evaluated across two subsets of the data: premises reporting live animal movements onto the operation and premises reporting no live animal movements onto the operation during the 30-day reference period (Figure 7). Overall, operations that did not report the movement of live cattle onto the premises during the 30-day reference period had a median of 74 visitors (range: 0–421) during that same time frame, while premises reporting live animal movements onto the premises had a median of 105 visitors (range: 0–401).

Visits by renderers were reported by 50 percent (30 out of 60) of premises without live animal movements and 77 percent (60 out of 78) of premises with live animal movements during the 30-day reference period; however, the median frequency of visits to farms by renderers, 15 (range: 1–30), was greater for premises without live animal movements than for premises with live animal movements, median 9 (range: 1–40). Nonetheless, the frequency of visitors to all impacted premises demonstrates a potential risk factor and emphasizes the need for the implementation of stringent biosecurity practices.

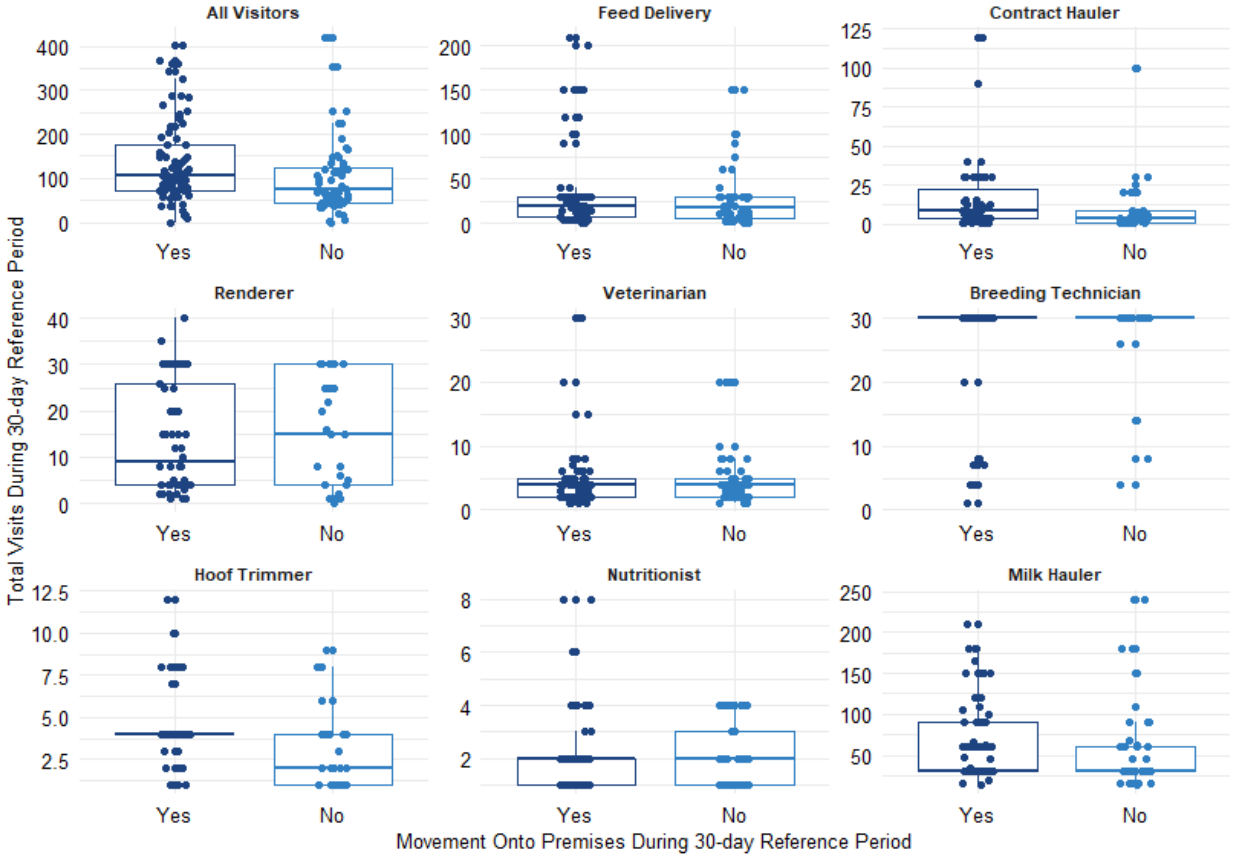


Figure 7. Median and range of the reported number of visits per visitor type, by reported movement of live cattle onto the premises during the 30-day reference period.

In addition to visitors, dairy workers may be potential sources of disease introduction and spread, particularly if they have contact with livestock or poultry outside of the infected premises or if they have regular contact with individuals employed by other operations. To identify this potential risk, respondents were asked a series of questions regarding employees and members of their household. Because the respondent may be unsure about employee activities outside of work, response options included a “Don’t Know” response category. Results for these questions are shown in Table 4. Overall, most respondents reported no contact between the dairy’s workers or members of their

household and other livestock. Workers visiting another dairy (29 out of 142), workers being employed by another dairy (19 out of 144), and workers owning their own livestock or poultry (38 out of 138), had the highest "Yes" response rates and are potential risk factors for disease introduction.

Table 4. Numbers of respondents who reported workers and members of workers' household with potential exposure to other livestock or poultry.

Workers…	Yes	No	Don't Know
Visit Another Dairy*?	29/142	53/142	60/142
Visit Livestock/4-H Shows*?	8/144	78/144	58/144
Own Their Own Livestock/Poultry?	38/138	53/138	47/138
Workers Employed By…	**Yes**	**No**	**Don't Know**
Other Dairies?	19/144	90/144	35/144
Poultry Farms?	2/143	112/143	29/143
Swine Farms?	4/143	110/143	29/143
Other Livestock Farms?	4/142	103/142	35/142
Members of Workers Household Employed By…	**Yes**	**No**	**Don't Know**
Other Dairies?	12/144	77/144	55/144
Poultry Farms?	4/141	84/141	53/141
Swine Farms?	3/142	88/142	51/142
Other Livestock Farms?	3/141	80/141	58/141

*During the 30-day reference period.

Wild Birds and Mammals

Spillover of virus from wild birds continues to play a substantial role in the ongoing outbreak of HPAI in poultry (Youk et al., 2023). To date, the initial detection in dairy cattle is believed to be the result of an introduction of the circulating wild bird variant into cattle (Nguyen et al., 2025), with subsequent direct and indirect spread between dairy premises. Still, wild birds and mammals present a risk for HPAI spillover, and surveillance of wild populations on affected premises is ongoing.

To characterize these potential risk factors, the questionnaire asked how frequently specific types of wild birds were seen on the operation and within 100-yards of the cattle during the 30-day reference period. Response options for these questions were "Often (51–100% of the time)," "Sometimes (1–50% of the time)," and "Never (0% of the time)." Results for these questions are presented in Figure 8. Notable possible risk factors include the frequent observation of small perching birds; pigeons and doves; blackbirds, crows, cowbirds, or grackles; and rodents. When asked, 22 percent (31 out of 141) of respondents reported observing sick or dead birds on the premises during the 30-day reference period. Sick bird types reported included small birds, starlings, pigeons, blackbirds, and sparrows. In addition, respondents were asked how often wild mammals

or rodents, or evidence thereof, were seen on the premises during the 30-day reference period. For wild mammals, 13 percent (19 out of 141) responded “Often,” 60 percent (84 out of 141) responded “Sometimes,” and 27 percent (38 out of 141) responded “Never.” For rodents, 44 percent (62 out of 141) responded “Often,” 50 percent responded “Sometimes,” and 6 percent (9 out of 141) responded “Never.”

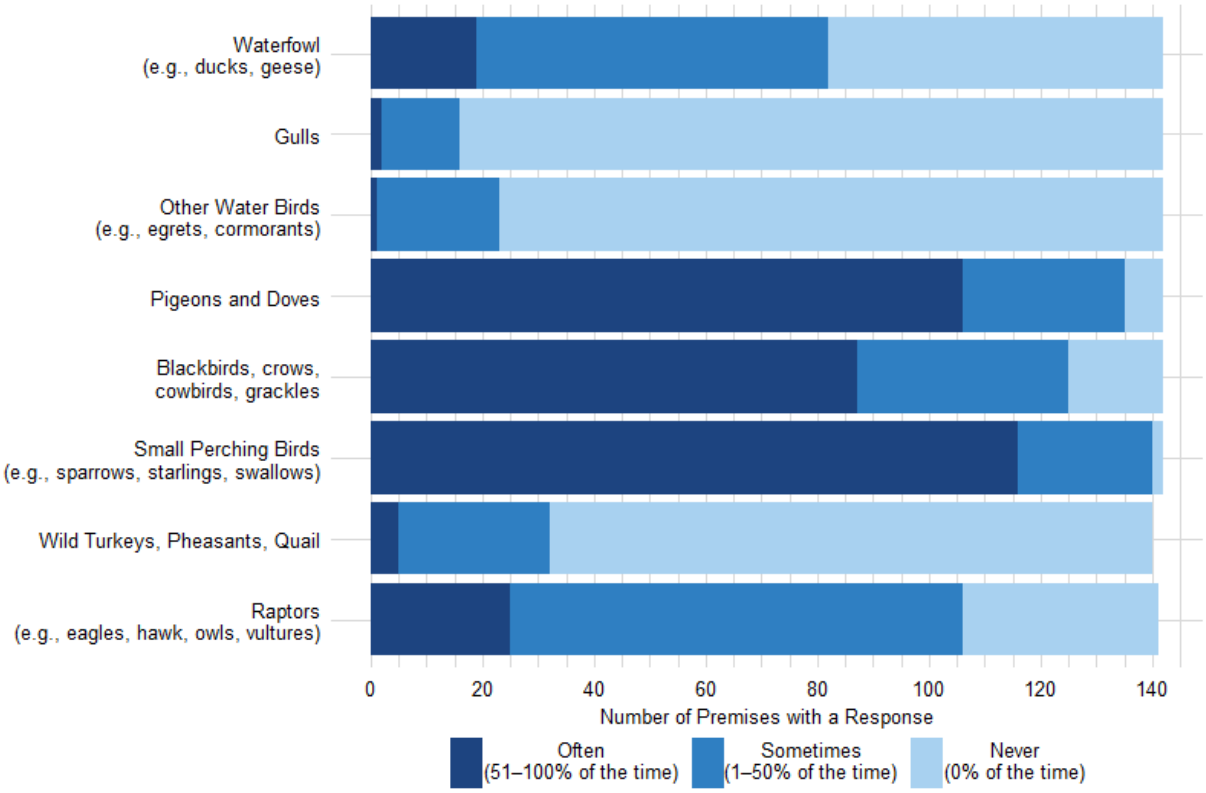


Figure 8. Reported frequency of observation of wild birds on the operation and within 100-yards of the cattle during the 30-day reference period.

The reported frequency of wild bird observations was examined by whether or not a premises reported movements of live cattle onto the premises (Figure 9). Premises without live animal movements during the 30-day reference period had a higher proportional response for “Often” seeing gulls, pigeons and doves, small perching birds, as well as blackbirds, crows, cowbirds, or grackles. Furthermore, premises without movements reported seeing sick or dead birds at a higher frequency (32 percent; 19 out of 59) than premises with live animal movements (15 percent; 12 out of 81). Notably, house sparrows and pigeons, as well as a starling and magpie harvested during increased surveillance in States with impacted dairies, have tested positive for H5N1.[13] The frequent observation of these wild bird types and their known potential to become infected with H5N1 emphasizes the potential risk of HPAI transmission in peridomestic

[13] HPAI Detections in Wild Birds

wild bird populations, and to the extent possible, the need to deter wild birds from dairy operations.

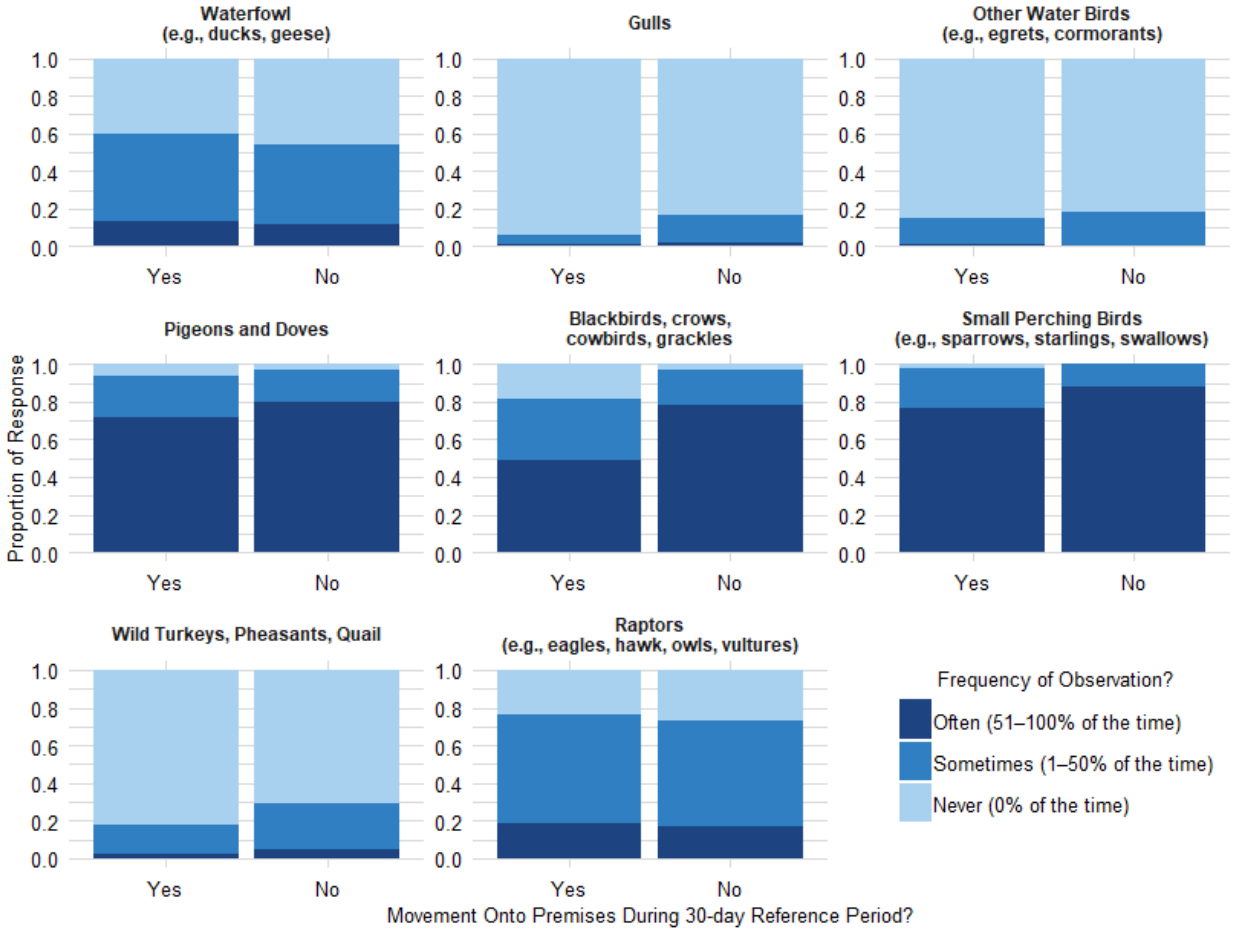


Figure 9. Proportional frequencies of wild bird and mammal observations, by reported movement of live cattle onto the premises during the 30-day reference period.

Respondents were also asked if they observed wild birds in or around cattle drinking water sources, and if wild birds, wild animals, or rodents had access to cattle feed or feed ingredients during the 30-day reference period. Response options for these questions were “Always (100% of the time),” “Most of the time (51–99% of the time),” “Sometimes (1–50% of the time),” and “Never (0% of the time)” (Figure 10). Examples of large birds provided in the question included waterfowl, such as ducks and geese, and raptors, such as hawks. Examples of small birds provided in the question included finches, sparrows, starlings, pigeons, blackbirds, grackles, and cowbirds. Responses of “Always” or “Most of the time” were high for all questions. More than 90 percent (128 out of 142) of respondents indicated small birds had access to cattle feed or feed ingredients “Always” or “Most of the time” through feed spillage, open bag, cover left open, feedline, and commodity bays.

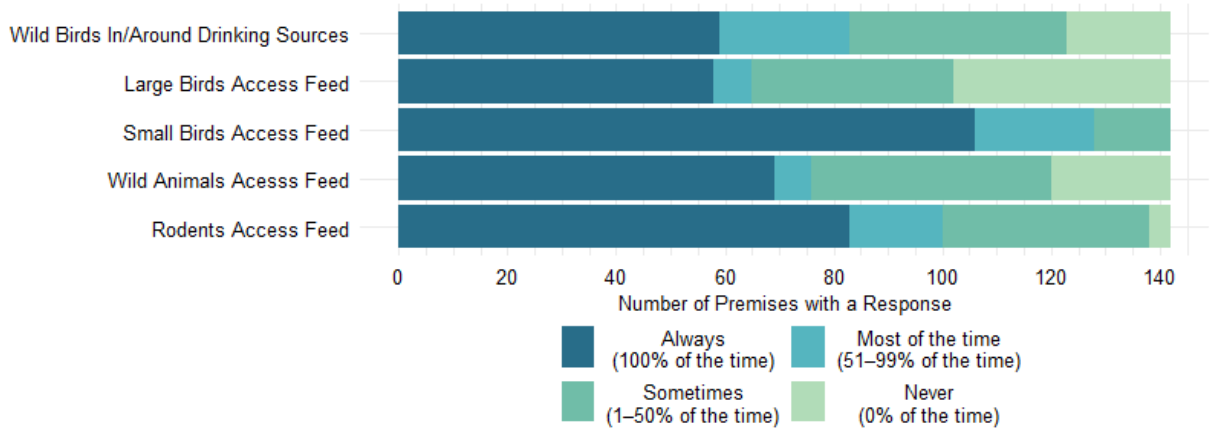


Figure 10. Reported frequency that wild birds, mammals, or rodents had access to water or feed during the 30-day reference period.

Waste Milk and Manure Management

The questionnaire also included questions to collect information about operation practices related to waste milk disposal practices and manure management (Table 5 and Table 6). Overall, nearly 60 percent of premises (84 out of 144) reported disposing of any waste milk in a lagoon during the 30-day reference period. The next most common waste milk disposal practices reported were feeding waste milk to calves on the premises (57 out of 144), feeding waste milk to calves at another premises (28 out of 144), and feeding waste milk to cats or dogs on the dairy (19 out of 144). The majority of premises that reported disposing of waste milk in the lagoon did not treat the milk prior to disposal (73 out of 84). For the 57 premises that reported feeding waste milk to calves on the dairy, 16 reported not treating the waste milk prior to feeding to calves, and 41 reported the following treatment practices: 38 pasteurized/heat treated, 2 chemically treated, and 1 used pasteurized/heat treatment or chemical treatment prior to feeding to calves on the premises. “Other” methods of waste milk disposal specified included dumping (n = 2), disposing in a pit (n = 2), selling to another premises (n = 2), disposal in a barn septic system (n = 1), and disposal via wastewater plant processing (n = 1).

Table 5. Number of respondents that reported disposal practice(s) for waste milk on the premises and the treatment practice(s) used prior to disposal during the 30-day reference period.

Disposal Method	Number Reporting Practice[a]	Treatment Practices Prior to Disposal[b]					
		NT	PHT	PHT or NT	PHT or CT	CT	NR
Disposed of in lagoon	84/144	73/84	4/84	1/84	0/84	3/84	3/84
Fed to calves on this dairy	57/144	16/57	38/57	0/57	1/57	2/57	0/57

Disposal Method	Number Reporting Practice[a]	Treatment Practices Prior to Disposal[b]					
		NT	PHT	PHT or NT	PHT or CT	CT	NR
Fed to calves at another premises	28/144	1/28	24/28	0/28	0/28	0/28	3/28
Fed to cats or dogs on the dairy	19/144	10/19	6/19	3/19	0/19	0/19	0/19
Fed to swine (on or off-site)	4/144	2/4	2/4	0/4	0/4	0/4	0/4
Disposal method not reported	3/144	0/3	0/3	0/3	0/3	0/3	3/3
Other	8/144	7/8	0/8	0/8	0/8	1/8	0/8

[a] Respondents could report more than one waste milk disposal practice during the 30-day reference period.

[b] Respondents could report more than one treatment method during the 30-day reference period. NT: No Treatment; PHT: Pasteurized/Heat Treated; CT: Chemical Treatment; NR: Not Reported.

Note: Denominators for treatment methods reflect number of surveys reporting disposal practice.

Respondents were asked a series of questions about manure management practices utilized during both the 30-day reference period and since clinical signs were first observed (Table 7). Response categories were either “Yes” or “No.” Manure was frequently stored on premises during both the 30-day reference period (134 out of 141 responses) and since clinical signs were first observed (125 out of 135 responses). Fifty-one percent (72 out of 141) of respondents indicated application of manure to land managed by the premises occurred during the 30-day reference period; this was reduced to 32 percent (42 out of 131) since the onset of clinical signs. The questionnaire also asked if manure or used bedding was brought onto the operation during the reference period: 5 percent (7 out of 143) answered “Yes,” 91 percent (130 out of 143) answered “No,” and 4 percent (6 out of 143) answered “Don’t Know.”

Table 6. Manure management practices reported during the 30-day reference period and since clinical signs were first observed.

Practice	30-day Reference Period	Since Clinical Signs were First Observed
Stored on premises	134/141	125/135
Composted for bedding	49/139	45/133
Applied to land managed by premises	72/141	42/131
Removed, Sold, Given Away	39/140	21/131

Other Potential Sources of Introduction

The questionnaire included several other questions to explore potential sources of H5N1 virus introduction. Results for these questions are presented in Table 7. The use of shared trucks or trailers, especially when not cleaned, represents a potential risk factor for disease introduction onto a premises. Respondents were asked whether cattle were transported in trucks and/or trailers shared with other livestock operations during the 30-day reference period and 38 percent (55 out of 145) responded “Yes,” while 22 percent (13 out of 59) of premises without live animal movements onto the operation reported sharing trucks or trailers, compared to 48 percent (39 out of 82) of premises with live animal movements onto the premises. When trucks or trailers were shared, 53 percent (27 out of 51) of respondents indicated they were not cleaned prior to use. When cleaned, 59 percent (13 out of 22) reported they “Wash vehicle and chemically disinfect,” 36 percent (8 out of 22) reported “Wash vehicle with water or steam only,” and less than one percent (1 out of 22) reported “Chemically disinfect only.”

The questionnaire also asked if the operation used the same equipment to handle manure and feed during the 30-day reference period; 23 percent (32 out of 140) indicated “Yes.” If “Yes,” additional questions were asked regarding the use of separate buckets, cleaning the equipment (excluding separate buckets) between use for manure and use for feed, and cleaning procedures. Performance for this series of questions was poor, with several surveys violating the indicated skip pattern, which suggests the intent of the question was unclear or misunderstood and results should be interpreted cautiously. During the data cleaning and validation phases, the decision to adhere to the original skip pattern was made and the responses to the subsequent questions were excluded if the response to shared equipment was “No.” For the premises that answered "Yes” to the same equipment being used, 74 percent (23 out of 31) responded “Yes” to separate buckets being used, and 48 percent (14 out of 29) indicated equipment was cleaned between use for manure and use for feed. When asked about cleaning practices, 100 percent (14 out of 14) answered they “Wash equipment with water or steam only.” To help mitigate this risk of disease introduction and spread, minimizing the use of shared equipment, and when sharing is necessary, proper cleaning prior to use is recommended.

Table 7. Operation characteristics and practices that may have a role in H5N1 virus introduction onto dairy premises.

Characteristics and Practices	Yes	No	Don’t Know
Commercial poultry operations within 5 miles	28/141	95/141	18/141
Feed components include feather/poultry meal	2/141	128/141	11/141
Feed components include poultry litter/manure	2/141	136/141	3/141
Feed components include other poultry byproducts	0/140	132/140	8/140
Transport cattle in shared trucks and/or trailers*	55/145	90/145	—
Shared trucks or trailers cleaned prior to use*	24/51	27/51	—

Characteristics and Practices	Yes	No	Don't Know
Same equipment to handle manure and feed?*	32/140	108/140	—
Separate buckets used to handle manure and feed?	23/31	8/31	—
Equipment (excluding separate buckets) cleaned between use for manure and use for feed	14/29	15/29	—
Milk trucks pick up partial semi-truck loads*	52/142	83/142	7/142

*During the 30-day reference period.

F. Limitations

A primary limitation of a case-series study is that only cases (infected farms) are investigated, and there is no comparison group (non-infected farms). The results of case-series studies are descriptive and summarize the characteristics of the case group; no formal statistical analyses have been performed. A case-series study can be helpful to inform hypotheses that can be evaluated later using a more robust study design, such as a case-control study to evaluate risk factors associated with infection.

The questionnaire was rapidly developed following the initial detection of H5N1 in dairy cattle in March 2024. The immediate need for a survey did not allow for pre-testing of questions prior to release. Where possible, questions that performed well in prior USDA National Animal Health Monitoring System studies were utilized; however, it is possible that the intent of some questions was misunderstood, and any future versions of the questionnaire will take question performance into consideration for revision. Furthermore, some Federal and State responders without enumerator training administered questionnaires, and in some instances, they were self-administered by producers. This may also contribute to inconsistencies in interpretation and response across respondents.

G. Next Steps

This report summarizes data collected using the questionnaire developed by USDA–APHIS. Several States developed and administered their own separate questionnaires. Although some data from State questionnaires are available in EMRS, they were not included in the results presented here. Future reports may incorporate data from State questionnaires, when possible (e.g., where questions are sufficiently similar), following review and data validation.

A selection of variables from the USDA–APHIS questionnaire has been summarized in this report. The intent is to produce a final report summarizing all surveys collected through December 31, 2025, the cutoff date for mandatory survey administration.

Note: The information provided in this report is a provisional summary of results from questionnaire data received through September 30, 2024.

PHYLOGENETIC ANALYSIS AND DIAGNOSTICS

A. Background

Whole genome sequencing of H5N1 viruses provides information on the relationship between the viruses in different animals and on different farms, providing context and support to guide epidemiologists in their investigation. NVSL sequences avian influenza viruses from a variety of sources, including wild birds and mammals, poultry detections, and unusual hosts, such as dairy cattle. Comparison of the virus sequences allows them to identify which are more closely related and may have been caused by movement within domestic animal populations, versus those that are most likely spillovers of virus.

Collaborators from Cornell University, Iowa State University, Texas A&M University, Washington State University, and the USDA have described genomic analyses and epidemiologic investigations undertaken in response to the emergence of HPAI H5N1 in dairy cattle (Nguyen et al., 2025).

B. GenoFLU Tool Classification and Genotype Distribution

GenoFLU is a bioinformatics tool that helps identify and track both introductions of HPAI H5Nx goose/Guangdong clade 2.3.4.4b into North America and their subsequent re-assortment with North American wild bird avian influenza viruses. The genotyping scheme uses a system of letters and numbers to identify the genotypes.

This tool considers all eight gene segments and can classify clade 2.3.4.4b viruses that have reassorted with North American low pathogenic viruses. The GenoFLU tool was developed for North America, utilizing references detected primarily within the United States. Using GenoFLU, fully Eurasian and distinct introductions of H5 2.3.4.4b virus are denoted by genotypes, starting at “A” and continuing with serial numbering. Genotype A1 Eurasian viruses that have re-assorted with North American low pathogenic viruses by their initial introduction are denoted by genotypes starting with “B,” with serial numbering of independent re-assortment events, and re-assortments of the A2 virus introduction are denoted by genotypes starting with “C,” with serial numbering or independent re-assortment events.

Genotype A1 (fully Eurasian [EA]) was first identified in Newfoundland in November 2021 and subsequently in wild birds in the Atlantic flyway collected in December 2021. A1 became the predominant unreassorted genotype across all four flyways during 2022, and reassortants of A1 with North American (AM) low pathogenic avian influenza viruses created the “B” genotypes that subsequently predominated during this event.

The first “B” reassortant genotype was collected in late January 2022, and detection of several other reassortant genotypes followed, continuing into 2024. The B3.2 genotype is a four-gene EA/AM reassortant first detected from samples collected in March 2022 and is the most frequently detected genotype to date in the Americas. By fall of 2022, this genotype had disseminated along flyways into Central and South America, with detections as far south as Antarctica.

Genotype B3.13 emerged sometime in the fall of 2023, with only four detections in wild species prior to the detections in cattle: one goose in Colorado, one goose in Wyoming, one raptor in California, and one skunk in New Mexico. The earliest of these was November 2023 in the Central flyway (Colorado). In late March 2024, genotype B3.13 was identified in the milk of dairy cattle; the initial spillover event from avian species to cattle is estimated to have occurred sometime between late 2023 to early 2024. After the detection of B3.13 in dairy cattle, secondary spread among dairy farms continues, with virus from the dairies affecting peridomestic wildlife, domestic cats, and domestic poultry.

SPATIAL ANALYSIS OF THE 2024 COLORADO HPAI IN LIVESTOCK INCIDENT

A. Introduction

Emergency animal disease response activities, such as active surveillance, often take place in the context of geographic zones, including HPAI Control Areas, which represent areas of elevated risk for disease transmission. The locations and sizes of zones should be informed by the spatial distance separating linked cases. The objectives of this analysis were to use Colorado HPAI-infected dairy premises data to identify the mean distance between sequential cases, to estimate the relative risk of infection as a function of distance between premises, and to evaluate hypothetical zones of varying sizes in their ability to cover all infected but undetected dairy premises.

B. Mean Transmission Distance

Estimation of a spatial transmission kernel—this describes the probability that an infectious premises will infect a susceptible premises given the distance between the two. It defines the spatial area where direct disease transmission occurs—can be improved by identifying which infected premises were directly linked to each other through epidemiological investigation, including tracing activities and genomic sequencing; however, epidemiological investigations are often unable to identify routes of transmission with certainty. This is especially true in the case of emerging diseases like H5N1 in livestock, where less is known about disease processes and transmission risk. Furthermore, a pair of related HPAI-infected livestock premises occurring at two time points may be the result of transmission directly from one to the other, or there may be multiple transmission events separating them through an unknown number of livestock premises—i.e., the transmission chain.

In the absence of complete transmission chain information, the mean distance and standard deviation of the transmission kernel can be estimated using the point locations of infected premises, their clinical onset dates, and the generation time of the pathogen (the time between infection of a primary case and its secondary case). With this information, it is possible to estimate a probability distribution of the number of transmission events separating two premises, meaning that given the clinical onset dates of all infected premises and the generation time of the virus, we can estimate for each pair of infected premises the probabilities that one premises directly infected the other or that there were two, three, or more transmission events separating them. From that distribution of probabilities for each pair of premises, a weighted mean and standard deviation of the distance between sequential cases is calculated (Salje et al., 2016).

The mean transmission distance for 62 infected Colorado dairies with clinical onset dates spanning 82 days from May 15, 2024 to August 5, 2024 is shown in Figure 11. The 95 percent confidence interval early in the outbreak is wide because of the small number of premises used to calculate the mean distance. By Day 30 (June 14, 2024), when there were greater than 20 clinical cases, the confidence interval narrowed, and the mean transmission

distance was 7.5km to 9km. The upper end of the 95 percent confidence interval ranged from 8.5km to 10.2km from Day 30 until Day 82, when one infected premises, far removed from the others, caused an increase.

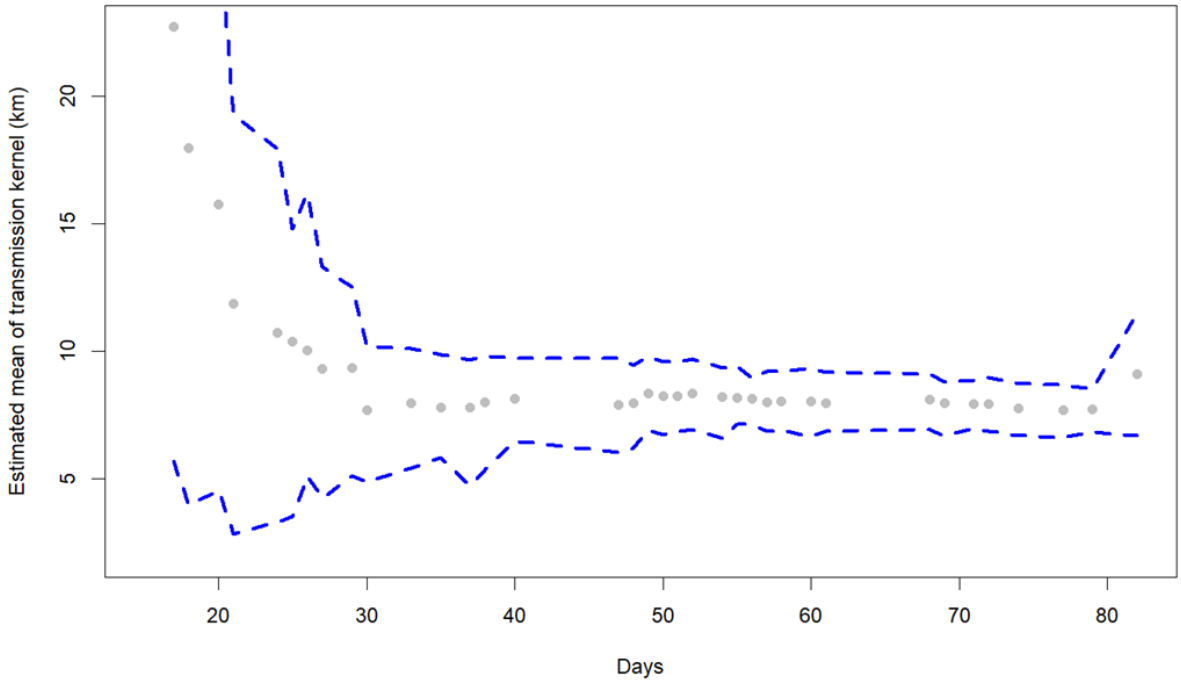


Figure 11. The mean transmission distance by day (grey dots) and 95% confidence interval (blue dashes) among the 62 B3.13 H5N1-infected dairy premises in Colorado.

For this analysis, the two earliest infected premises in Colorado were excluded because of the 3-week gap between their onset dates and those of subsequent infected dairy premises in Colorado. The mean spatial distance was calculated for time steps, which had at least three cases. Therefore, the earliest mean distance is for Day 17 (June 1, 2024). The mean generation time for this analysis was assumed to be 2 days (standard deviation = 5 days) based on an experimental study of H5N1 B3.13 virus in cattle (Baker et al., 2024).

C. Relative Risk of Infection as a Function of Distance

In epidemiology, the relative risk of infection is a common measure of the strength of association between an exposure and a disease. The relative risk is a ratio of the risk of infection in the exposed group to the risk of infection in a non-exposed group. The tau-statistic is an analogous spatial measure of the relative risk of a premises at a particular spatial distance from an infected premises also being infected, versus the risk of any premises in the population being an infected premises, regardless of distance to other infected premises (Lessler et al., 2016). The tau-statistic values at 5km increments are shown in Figure 12; because the tau-statistic is a ratio, a value of 1 indicates no relative difference in infection risk. The tau-statistic values from 0km to 25km were greater than 1,

indicating that risk of infection was elevated at those distances. As an indicator of statistical significance, the 90 percent bootstrapped confidence interval excluded 1 for distances up to 20km; however, the 95 percent confidence interval (not shown) did not exclude 1, indicating that elevated risk at these distances was not significant. This may be related to the small number of premises that were included in this analysis. The mean transmission distance and tau-statistic analyses were performed using the IDSpatialStats Package in R (Giles et al., 2019).

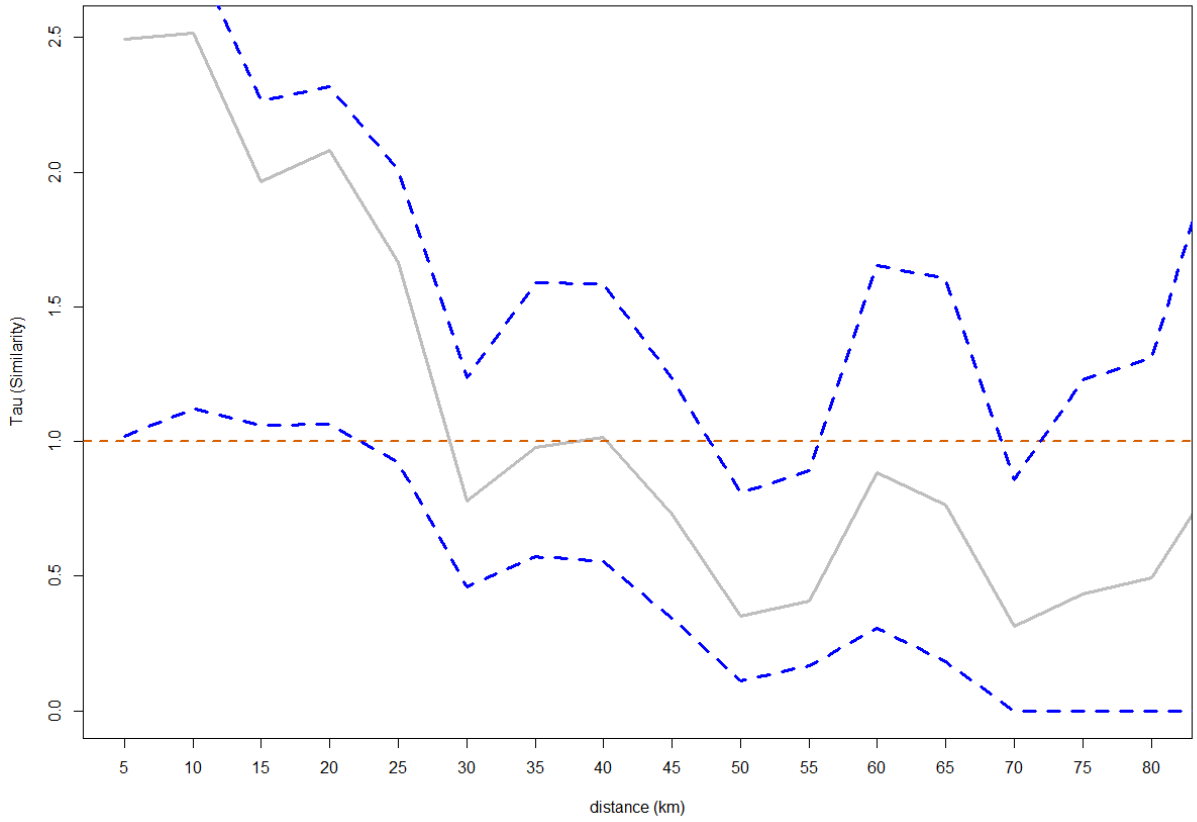


Figure 12. Tau-statistic values in 5km increments from 5 to 80km (solid line) and 90% bootstrapped confidence intervals (dashed lines).

D. Evaluation of Zone Sizes

Emergency responses to HPAI in commercial poultry typically apply a minimum 10km radius Control Area around infected premises that is immediately surrounded by a 10km wide Surveillance Zone. For HPAI in livestock, the appropriate minimum zone size is unknown. To investigate the effectiveness of different zone sizes, the weekly locations of detected dairies were mapped and overlayed with circular zones with overlapping radii of 10km, 20km, 30km, and 40km established around each detected dairy premises (Table 8). Infected but undetected dairies were also mapped to evaluate how well the zones of varying size

would have encompassed all undetected infected dairies each week. A dairy premises' day of infection was assumed to be the reported clinical onset date minus 5 days.

Table 8. Weekly summaries of the number of HPAI-detected dairies, numbers of infected but undetected dairies located within four circular zones created around detected dairy premises with radii ranging from 10km to 40km, and the total number of premises with at least one dairy cow located within those same four zone sizes (estimated from the 2017 Agricultural Census).

Epidemiological Week	Distance From Detected Premises	# Estimated Infected & Undetected Premises	Estimated Total # of Dairies
1	0-10km	0	8
(May 19–May 25)	10-20km	0	15
Detected dairies = 2	20-30km	0	7
	30-40km	0	15
	>40km	1	-
2	0-10km	4	8
(May 26–June 1)	10-20km	1	15
Detected dairies = 2	20-30km	0	7
	30-40km	0	15
	>40km	2	-
3	0-10km	6	9
(June 2–June 8)	10-20km	7	19
Detected dairies = 3	20-30km	1	19
	30-40km	0	20
	>40km	0	-
4	0-10km	13	18
(June 9–June 15)	10-20km	5	14
Detected dairies = 8	20-30km	0	21
	30-40km	0	25
	>40km	0	-
5	0-10km	6	22
(June 16–June 22)	10-20km	4	19
Detected dairies = 20	20-30km	2	21
	30-40km	0	26
	>40km	0	-
6	0-10km	7	26
(June 23–June 29)	10-20km	5	20
Detected dairies = 25	20-30km	3	33
	30-40km	0	22
	>40km	0	-
7	0-10km	6	27
(June 30–July 6)	10-20km	6	21
Detected dairies = 28	20-30km	7	33
	30-40km	0	20
	>40km	0	-
8	0-10km	10	43

Epidemiological Week	Distance From Detected Premises	# Estimated Infected & Undetected Premises	Estimated Total # of Dairies
(July 7–July 13)	10-20km	2	32
Detected dairies = 40	20-30km	0	19
	30-40km	0	14
	>40km	0	-
9	0-10km	5	44
(July 14–July 20)	10-20km	2	32
Detected dairies = 47	20-30km	0	18
	30-40km	0	14
	>40km	0	-
10	0-10km	6	44
(July 21–July 27)	10-20km	2	32
Detected dairies = 50	20-30km	0	18
	30-40km	0	14
	>40km	0	-
11	0-10km	2	45
(July 28–August 3)	10-20km	2	31
Detected dairies = 57	20-30km	0	18
	30-40km	0	14
	>40km	1	-
12	0-10km	0	47
(August 4–August 10)	10-20km	0	31
Detected dairies = 62	20-30km	0	21
	30-40km	0	19
	>40km	0	-

Table 8 also shows the number of detected premises each week, the numbers of infected but undetected premises located in the four different-sized zones, and an estimate of the number of uninfected dairies located within each zone. The number of estimated uninfected dairies located within each zone was included to provide an indication of the additional surveillance burden that may accompany increasing zone sizes. Their numbers and locations are based on county-level Agricultural Census data and a smart placement tool called the Farm Location and Agricultural Production Simulator (USDA NASS, 2017; Burdett, 2015). So, while the number of uninfected premises are consistent with the Agricultural Census at the county level, their specific locations within counties are simulated and do not represent the actual locations of uninfected dairies within the State. The uninfected dairies comprise any premises that reported having at least one dairy cow to the Agricultural Census, including non-commercial premises.

The week of May 5, 2024 to May 11, 2024 was the first week that a premises included in this analysis was assumed to be infected. The following week, May 12, 2024 to May 18, 2024, there were two more assumed infected premises. The first two non-negative

detections at a NAHLN laboratory occurred during the week of May 19, 2024 to May 25, 2024 (designated as week 1), with one infected premises remaining undetected. That undetected premises was more than 40km away from the two detected premises. The week of May 26, 2024 to June 1, 2024 (week 2) had the same two detected premises and one undetected premises and six newly infected but undetected premises. The 10km zones created around the two detected premises included four of the undetected premises. The 20km zones included one additional undetected premises. The other two undetected premises were more than 40km from the detected premises. The next week, June 2, 2024 to June 8, 2024 (week 3), there were 3 detected premises and 14 undetected premises. All but one of the undetected premises were located within 20km of a detected premises. The last premises was within 30km of a detected premises. Over the next four weeks, all undetected premises were located within 30km, and a majority were within 20km. After the week of July 7, 2024 to July 13, 2024 (week 8), all undetected premises were located within 20km of detected premises through week 12, with the exception of one premises infected during week 11 that was in a different region of the State and was the last detected premises in Colorado. On July 22, 2024 (during week 10), the State of Colorado issued a mandatory bulk milk testing order for all dairies in the State. That order likely affected the number of premises that were detected during weeks 11 and 12.

E. Key Findings

Key findings from the spatial analysis of the 2024 Colorado HPAI in livestock incident include:

- Farms located within 20km of an infected farm had greater risk of becoming infected than farms located any distance from an infected farm.
- Spread of HPAI among dairy farms in Colorado, on average, occurred over distances under 10km.
- If zones with radii of 30km were created around each detected farm at the time they were detected, those zones would have included nearly all the infected but undetected farms in Colorado.
- Creating 20km radii zones around detected premises would have included most infected but undetected premises and would have required less testing than 30km zones.

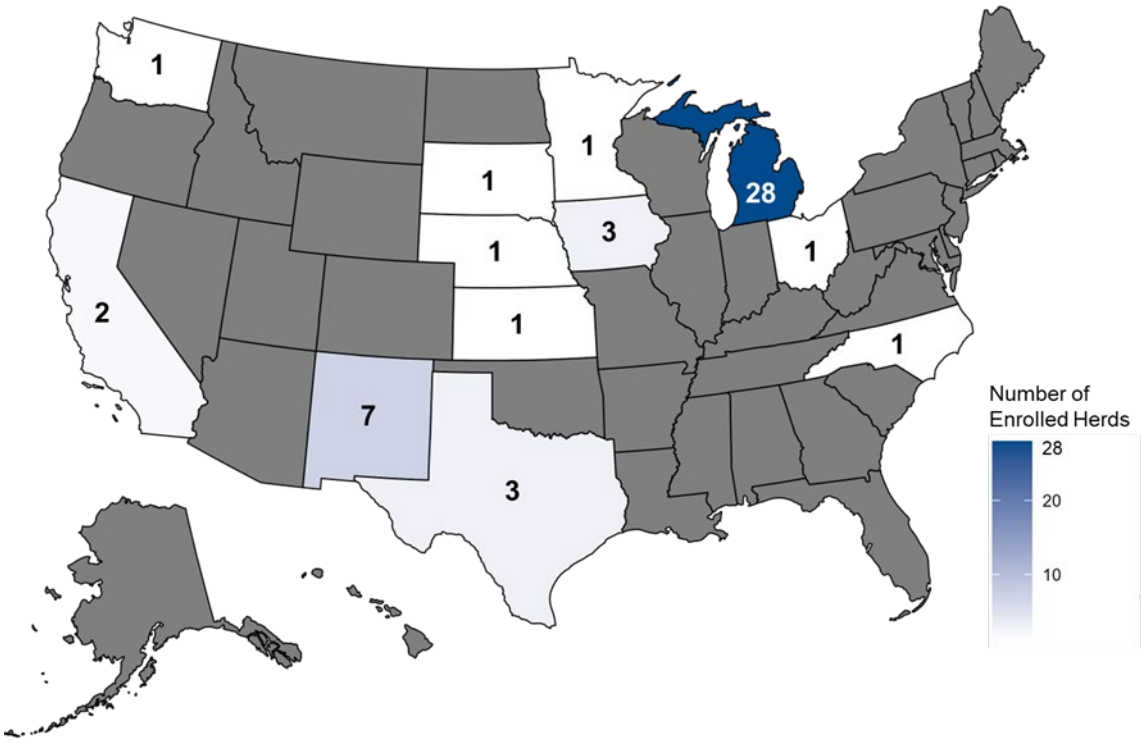
DAIRY HERD STATUS PROGRAM

The HPAI Dairy Herd Status Program is a voluntary program that offers dairy producers the option to monitor their herds via weekly bulk tank milk samples. Once Monitored Unaffected status is earned, the producer can move lactating cattle across State lines without having to test animals individually. It was designed to monitor and determine the extent of H5N1 virus in lactating dairy cattle and to reduce the risk of further transmission to poultry and livestock. The program is a cooperative effort between APHIS, regulatory State animal health agencies, dairy producers, the dairy industry, and industry stakeholders.

APHIS announced the HPAI Dairy Herd Status Program in May 2024, with the first herd enrolled in Texas in June 2024. The program has various components, including an opportunity for premises to establish a Monitored Unaffected herd status and then maintain that status by performing consecutive weekly bulk tank milk testing of lactating cattle on the premises. A herd obtains Monitored Unaffected status by enrolling in the program and having three or four consecutive weeks of negative prescribed test results. The timeline is dependent upon whether the herd has been previously confirmed with the disease (four weeks) or not (three weeks). This status qualifies a premises for interstate movement of lactating dairy cattle without additional individual animal testing. The program also offers dairy producers an additional option to monitor herd health, supports expanded knowledge of the disease in dairy herds, and reinforces the overall national program.

Interested producers start the enrollment process by contacting their APHIS Area Veterinarian in Charge or State Veterinarian. The herd monitoring plan, which includes sample collection and testing requirements, is developed between APHIS officials, the State, and producers. Additional information on the program, enrollment process, and herd status definitions are available on the APHIS Detections of Highly Pathogenic Avian Influenza (HPAI) in Livestock website and program fact sheet.

As of September 30, 2024, 12 States had a total of 50 premises enrolled in the program (Figure 13): 19 premises had a monitored unaffected status; 25 premises had a provisional status, which is the initial status of a new premises working towards Monitored Unaffected status; 6 of the 25 premises in Provisional status had not submitted their first bulk tank milk samples; 32 of the 50 premises were previously confirmed with HPAI; and 6 of the 32 premises were in a Monitored Affected status.



*Michigan (28), New Mexico (7), Iowa (3), Texas (3), California (2), Kansas (1), Minnesota (1), Nebraska (1), North Carolina (1), Ohio (1), South Dakota (1), Washington (1).

Figure 13. Dairy Herd Status Program Herd enrollment by State as of September 30, 2024.*

Individual States may build and administer a similar program in place of utilizing the APHIS HPAI Dairy Herd Status Program. Pennsylvania, Tennessee, and Virginia have programs considered equivalent to the APHIS program.

USDA–Wildlife Services HPAI Sampling on or Near Dairies

A. Objectives

With the occurrence of HPAI in dairy cattle across multiple States, a great deal is unknown on the role wildlife plays. Wildlife Services conducted enhanced surveillance for HPAI on or near current or previously infected dairy premises or poultry premises where there was a clear or strongly suggested spillover from a nearby dairy herd to wildlife. This sampling was performed to better understand transmission dynamics. The surveillance provided vital information to help bridge the gap of what is known about transmissibility of HPAI at dairy facilities to wildlife.

B. Methods

Wildlife Services conducted all surveillance activities with the direct cooperation of owners of the affected premises and at the behest of USDA APHIS Veterinary Services. Wildlife Services personnel were deployed on official orders via request orders through Veterinary Services dispatch. All activities were in accordance with the National Environmental Policy Act, U.S. Fish and Wildlife Service permits, and if applicable, any required State permits or licenses for wildlife sampling/removal.

Invitational Access

Wildlife Services is a non-regulatory agency, which means that Wildlife Services personnel must be invited onto a premises by an owner. Wildlife Services coordinated all activities with owners/managers to ensure minimal disruption to ongoing facility operations. This included after-hours and/or night work, if appropriate for the select species. Owners were asked to sign a Work Initiation Document (WS Form 12A) before Wildlife Services personnel started collection processes on or near a premises. This agreement between the premises owner and Wildlife Services specified what work Wildlife Services would conduct and what tools would be used on the property. To achieve maximum efficiency, Wildlife Services utilized intense sampling/removal programs to minimize project duration and disturbances on the premises. Wildlife Services used camera traps to help document species and intensity of use at areas attractive to wildlife in certain situations.

Collection

Wildlife Services sent teams of two to four biologists to sample all non-threatened and non-endangered species (birds and mammals) that they could capture or euthanize over a 10- to 14-day period on or adjacent to the infected premises. Wildlife Services personnel used multiple different capture removal methods to effectively conduct surveillance activities.

Captured wildlife were euthanized unless deemed otherwise by the Wildlife Services Project Lead. Euthanasia ensured possible positive animals were not released,

potentially spreading the virus. Feral cats were removed from the premises if asked by the owner, otherwise they were trapped and released after samples were collected.

Sampling

As of September 30, 2024, Wildlife Services collected animals from 21 premises in 6 States: California, Colorado, Idaho, Iowa, Michigan, and Minnesota. Data have been evaluated by the appropriate laboratory, though collection of samples by Wildlife Services is on-going. The data used for analysis does not represent all animals collected by deployed National Wildlife Disease Program (NWDP) teams.

The following types of swab samples were collected from each individual animal:

- Birds: Oral and cloacal swabs collected from all birds.
- Mammals: Nasal swabs collected, when possible; otherwise, oral swabs were collected. Paired lung swabs collected from small mammals (e.g., mice), when possible.

The most collected samples were European starlings in California; house sparrows in Colorado, Iowa, and Minnesota; and rock pigeons in Idaho and Michigan. This is unsurprising due to many species having specific home ranges. Unfortunately, the sampling of each species cannot be assumed to be representative of the State's population. Table 9 and Table 10 give an overview of the number of animals collected in each State using targeted sampling of wild birds and peridomestic mammals, respectively.

Table 9. As of September 30, 2024, total number of wild birds, by taxonomic order, collected by targeted sampling in each State.

Birds (Aves)	California	Colorado	Idaho	Iowa	Michigan	Minnesota	Total
Accipitriformes	1	0	0	5	2	0	8
Anseriformes	2	35	6	2	127	0	172
Charadriiformes	45	67	20	81	9	18	240
Columbiformes	211	152	82	167	190	27	829
Coraciiformes	0	0	0	0	3	0	3
Cuculiformes	0	0	0	1	0	0	1
Galliformes	0	1	0	0	0	0	1
Passeriformes	517	608	130	684	189	131	2259
Pelecaniformes	4	7	0	0	0	0	11
Piciformes	0	1	0	1	1	0	3
Suliformes	0	6	0	0	0	0	6
Total	780	877	238	941	521	176	3533

Table 10. As of September 30, 2024, total number of peridomestic mammals, by taxonomic order, collected by targeted sampling in each State.

Mammals (Mammalia)	California	Colorado	Idaho	Iowa	Michigan	Minnesota	Total
Carnivora	9	19	11	25	36	3	103
Didelphimorphia	0	0	0	0	13	0	13
Lagomorpha	2	22	0	19	1	2	46
Rodentia	11	105	1	17	53	27	214
Total	22	146	12	61	103	32	376

Under guidance from NVSL, each site was limited to 20 samples for each species per day per site and no more than 10 pigeons per day. All carcasses were disposed of according to best management practices as required to prevent the spread of disease.

Testing

All samples were sent to a NAHLN laboratory for polymerase chain reaction (PCR) testing for the presence of avian influenza viruses. If the initial PCR screening test resulted in any non-negative samples, these samples were forwarded to NVSL for confirmation testing and genomic sequencing.

Confidentiality

Wildlife detections were reported on the Detections of HPAI in Wild Birds or Detections of HPAI in Mammals webpages and reported to WOAH.

Detections in wildlife have no legal implications for the premises. Where required, the State wildlife agency was notified that Wildlife Services was collecting wildlife for emergency disease surveillance.

Prioritization

To make use of limited resources, Wildlife Services prioritized sampling of premises that met all or some of the following:

- Detections of HPAI in new States or new regions within a State
- Requests where the herd was still symptomatic or requests with a more recent PCR-positive test result
- Premises with recent wildlife or peridomestic mortalities

Biosecurity

Wildlife Services personnel adhered to recommended biosecurity practices while conducting all activities. All Federal personnel were medically cleared, and respiratory fit tested prior to deploying to a known-infected farm. On confirmed HPAI-infected facilities, all Wildlife Services personnel wore full PPE and N95 respirators when in the dirty or hot zone. Wildlife Services teams defined a clean/dirty or hot/cold zone on the first site visit. All equipment brought onto the facility was disinfected at the established clean/dirty line.

On all off-site areas outside of confirmed facilities, Wildlife Services personnel wore gloves and eye protection.

The deployed NWDP teams never moved from an infected premises to a non-infected premises. If there was a reason to visit an uninfected premises, a 5-day quarantine was observed, in addition to proper decontamination of any equipment taken to the uninfected premises. If a single owner had multiple infected premises within 15 miles of each other, teams could move between them, if authorized by the premises owner. Teams waited 72 hours before moving between infected premises with different owners unless there was an established epidemiological link and the NWDP Coordinator gave prior approval.

Wildlife Services coordinated with local Veterinary Services, the National Veterinary Stockpile and Wildlife Services offices for PPE and supplies. The names and contact information of all Federal personnel were submitted to the CDC and shared with the employees' local health department for monitoring for influenza-like illness following response and collection activities.

EVALUATION OF WILDLIFE SURVEILLANCE FOR HPAI H5N1 CLADE 2.3.4.4B ON OR NEAR IMPACTED DAIRY HERDS

A. Introduction

This preliminary analysis, using data available through September 30, 2024, investigated the relationship between dairy herds that tested positive for HPAI H5N1 clade 2.3.4.4b and infected wildlife on or near the impacted dairies. Specifically, it analyzed how delays in sampling may affect the ability to detect disease in wildlife. Additionally, it looked at the number of positive animals by taxonomic order. This information can have implications on how Wildlife Services surveillance data are interpreted and underscores the importance of surveillance in wildlife. This could provide more information on if spillback into wildlife from livestock is occurring or the likelihood of transmission among species. The preliminary analysis will be updated into a technical brief and is provided to help stakeholders understand wildlife data benefits and limitations.

B. Probability of Detecting HPAI H5N1 Clade 2.3.4.4b in Wildlife Relative to Affected Dairy Herds

Timing of wildlife sampling relative to clinical findings on dairy herds can affect the ability to detect clade 2.3.4.4b in wildlife. Delays in wildlife sampling can result from logistical constraints, as well as timeliness of producer approval of sampling. The average sampling occurred over a period of 5 days, with a maximum sampling duration of 8 days for three herds (Figure 14). All but one herd was sampled within 40 days of reported clinical start date.

A Cox proportional hazards model was used to investigate the relationship between date of wildlife sampling and date of reported clinical symptoms in a herd. Specifically, this model was used to determine the likelihood of detecting clade 2.3.4.4b in wildlife and how it varies with increasing time after reported clinical start of HPAI in dairy animals. Samples collected on 18 premises for 21 species were determined to have enough data resulting in 2,245 samples used to estimate the Cox model.

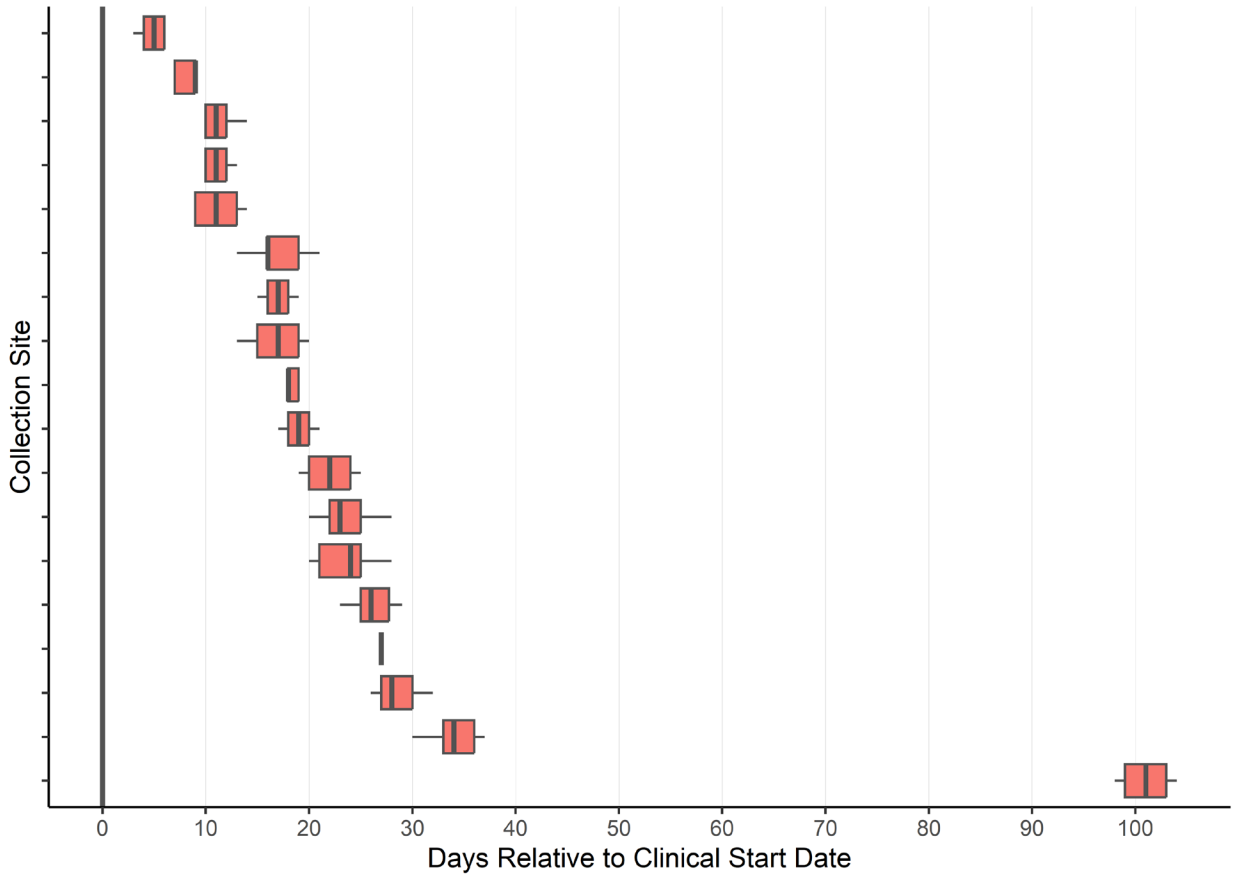


Figure 14. Distribution of sample collection date relative to reported clinical start date in dairy herds. Median is noted as a black line and outliers as circles. Boxes represent the interquartile range, and whiskers—the lines extending from the boxes on either side—are the 95% confidence interval.

The probability of detecting clade 2.3.4.4b in wildlife declined with the increasing number of days after clinical start date in dairy herds. The probability of detection approached 0 for many species near 30 days and the probability of detection dropped below 95 percent for all species after 10 days (Figure 15).

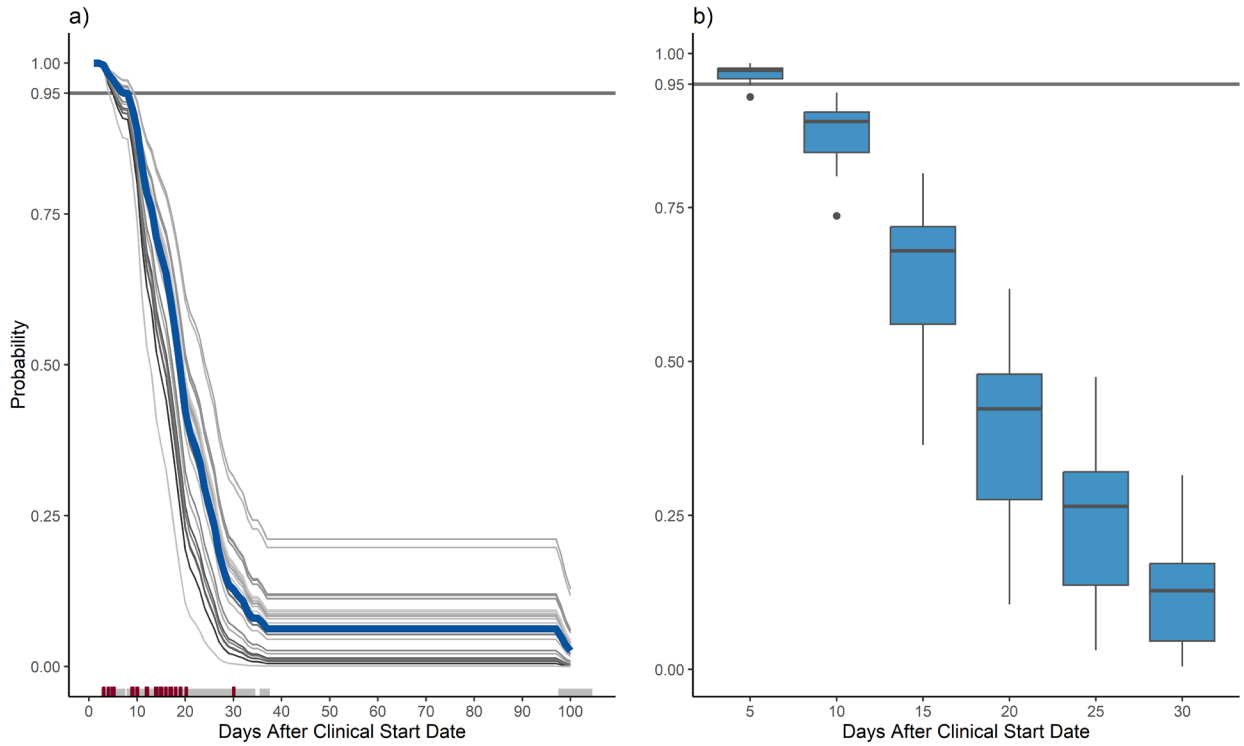


Figure 15. Probability of detecting clade 2.3.4.4b in wildlife after clinical start date in dairy herds.

In Figure 15, panel A includes the probability curves for each species (gray lines) and mean across all species (blue line). Red hatch marks on x-axis indicate positive findings in these 21 species, while gray hatch marks indicate negative findings. Panel B is the distribution of probabilities for specific time periods. Horizontal lines on each plot represent a detection probability of 0.95. Boxes represent the interquartile range, and whiskers are the 95 percent confidence interval. The median is shown as a black line, with outliers presented as circles.

C. Apparent Prevalence

Apparent prevalence was estimated using data collected from 29 dairy herds. Sample sizes by species on each herd were generally low (median = 3; 75th percentile = 10) and below that required to ensure detection of infected individuals, if present (Figure 16). Due to this limitation, analysis was conducted by taxonomic order and pooled across sampled herds to investigate potential trends in seroprevalence, or the number in a population of sampled animals that have antibodies to HPAI H5N1 clade 2.3.4.4b circulating in the bloodstream. The number of wildlife samples collected on or near each herd premises by taxonomic order was used as a weighting factor when pooling herd-level estimates of apparent prevalence.

In Figure 16, boxes represent the interquartile range, and whiskers are the 95 percent confidence interval. The median is shown as a black line, with outliers presented as circles. Avian species are indicated in red, mammals in blue, and all species in gray. The median number of samples collected on each herd by species was three and 75 percent of species had sample sizes below 10.

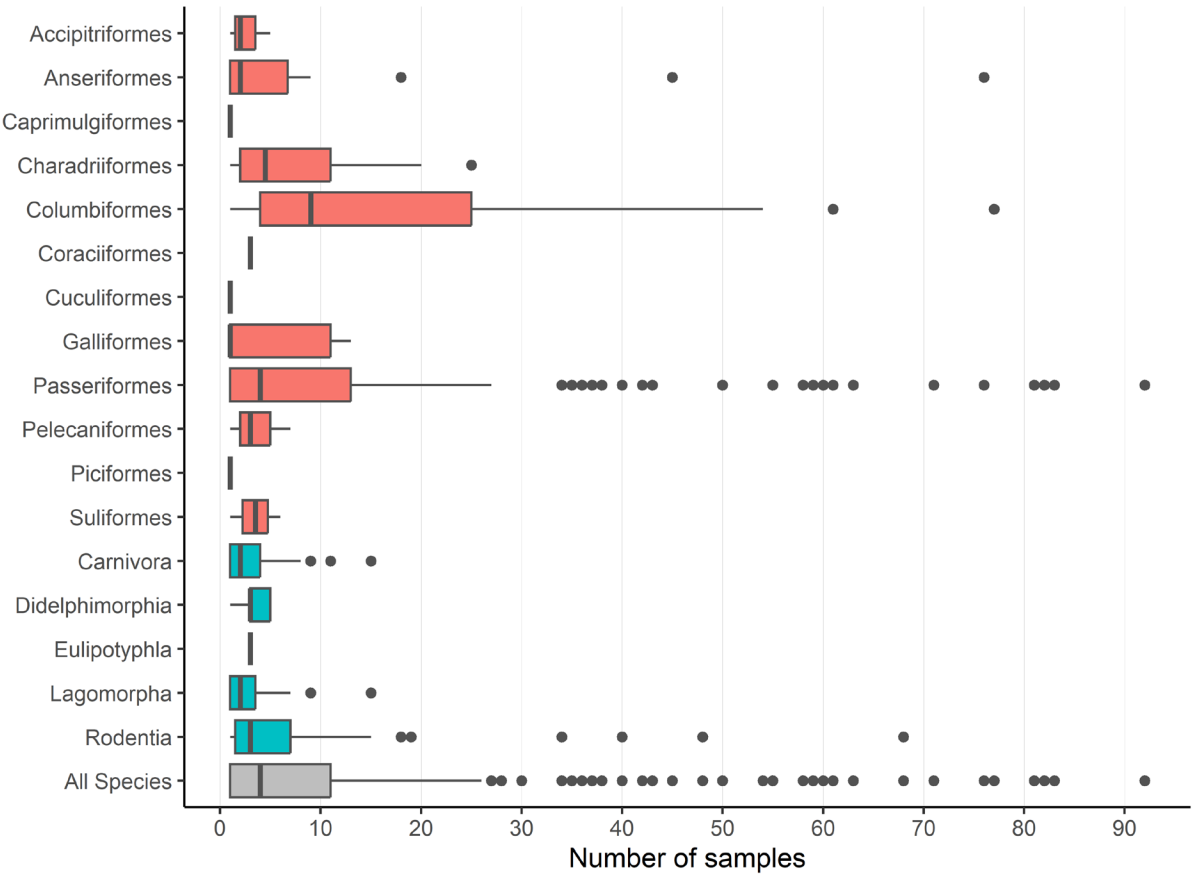


Figure 16. Distribution of number of samples collected on sampled herds.

Estimates of apparent prevalence tended to have large confidence intervals due to small sample sizes, as shown in Figure 17. Two taxonomic orders, Didelphimorphia and Accipitriformes, each composed of only one species, the Virginia opossum (*Didelphis virginiana*) and turkey vulture (*Cathartes aura*), respectively, had the highest pooled apparent seroprevalence. Caution should be used when interpreting these apparent seroprevalence estimates; most sites and species had very small sample sizes and were inadequate to detect infected individuals. Nevertheless, these results indicate that some species in the orders Didelphimorphia, Accipitriformes, Carnivora, Columbiformes, and Passeriformes may be involved on affected farms. There is currently not enough evidence available to exclude any of the other species from involvement in transmission of clade 2.3.4.4b.

In Figure 17, the number of samples collected on each herd were used as a weighting factor when pooling. Mammals are represented as blue and avian species as red. Bars indicate 95 percent confidence interval. Panel A depicts herds sampled within 80 days of reported clinical start date and panel B includes farms sampled within 20 days of reported clinical start date.

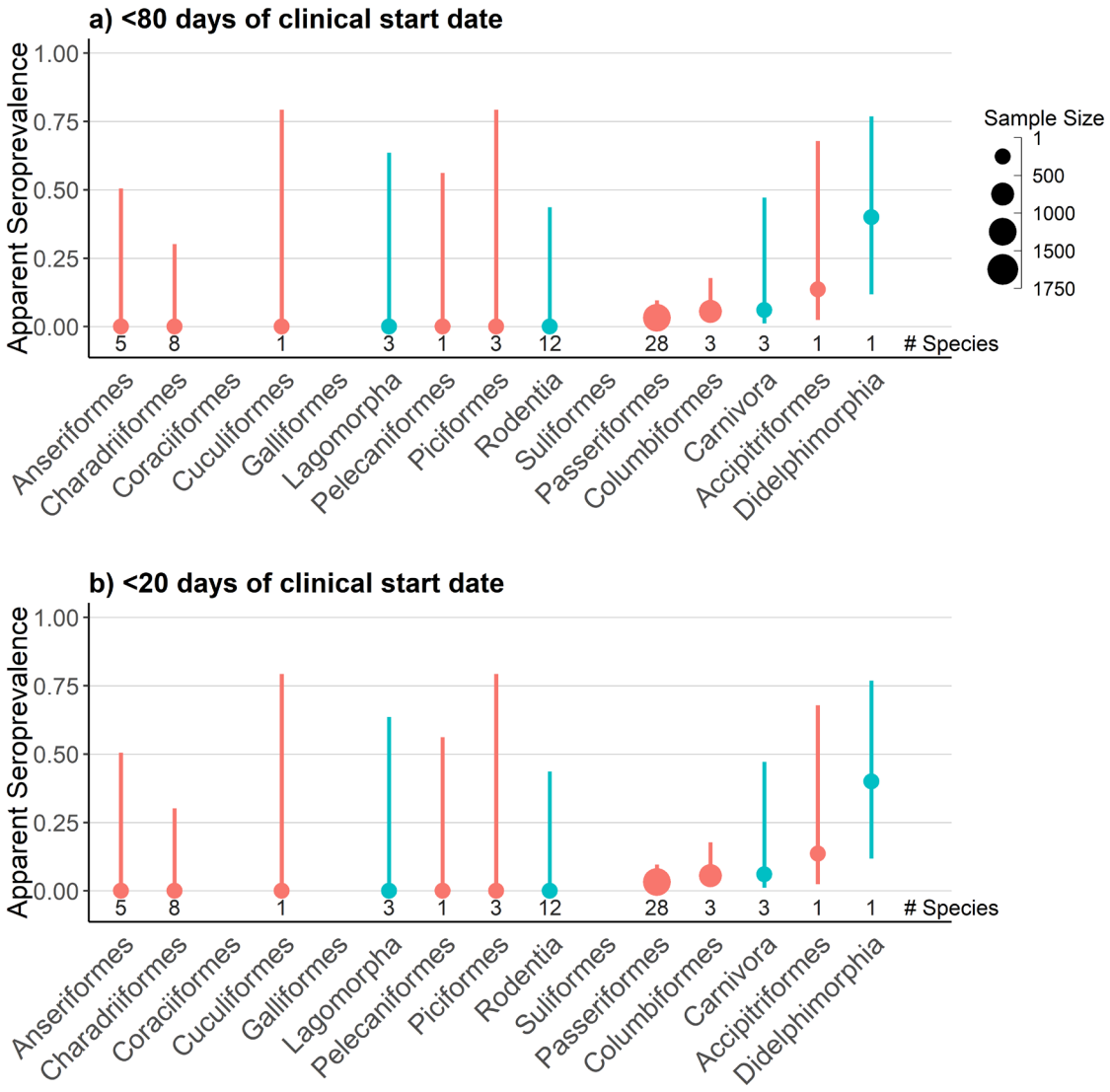


Figure 17. Pooled apparent seroprevalence of clade 2.3.4.4b across affected herds sampled by taxonomic order.

ACKNOWLEDGEMENTS

We greatly appreciate the cooperation and support of the dairy industry and farm owners for allowing access to their properties, for answering the epidemiology questionnaire, and for their cooperation with these investigations.

We also appreciate the diligent efforts of State and Federal responders to collect epidemiologic information while working to control this disease and their partnership with the resulting analyses.

This report would not have been possible without the large group of scientists, technical writers, epidemiologists, economists, laboratory staff, and data scientists who participated in the various analyses, drafting, and review of this report. We would like to extend our thanks to NVSL and APHIS Wildlife Services and convey our specific gratitude to the following individuals:

- Dr. Mia Torchetti, Dr. Kris Lantz, and Dr. Steven Lakin (NVSL)
- Dr. Julie Lenoch and Mr. Mike Milleson (Wildlife Services)

We appreciate their dedication and support in providing the best information possible to help producers reduce the risk of HPAI introduction into their operations.

APPENDIX A: DAIRY CATTLE EMERGING HEALTH EVENT: EPIDEMIOLOGICAL QUESTIONNAIRE

A 22-page questionnaire was developed and administered to farm owners or managers by Federal or State veterinary medical officers or completed by self-administration on each participating farm as a fillable PDF; appended on the next page.

DAIRY CATTLE EMERGING HEALTH EVENT: EPIDEMIOLOGICAL QUESTIONNAIRE	UNITED STATES DEPARTMENT OF AGRICULTURE ANIMAL AND PLANT HEALTH INSPECTION SERVICE VETERINARY SERVICES 2150 CENTRE AVE, BLDG B FORT COLLINS, CO 80526

Your participation is vital and will help APHIS understand the occurrence and extent of HPAI detections in cattle. APHIS will safeguard study data as Confidential Business Information (CBI), as defined in the U.S. Code of Federal Regulations (CFR) 19 CFR 201.6, and we will utilize exemption 4 for any Freedom of Information Act (FOIA) (5 U.S. Code 552) requests for survey information associated with this study. Response is voluntary and you may discontinue participation at any time.

Instructions

We are asking you to fill out this survey to provide information on daily farm activities, facility and premises practices, deliveries to the premises, and sick cattle. The purpose of this survey is to better understand the emerging health syndrome in dairy cattle first announced by USDA, March 25, 2024, and to explore potential risk factors for infections in cattle. Any reports from this study will combine the data from all participants. The results of this survey will be summarized to develop hypotheses and to identify specific topics for future follow-up studies.

To support rapid data extraction and analysis, please use and save the fillable form electronically when possible. The form can be downloaded and used on any device with Adobe Acrobat.

In the questionnaire, we frequently ask questions about a **30-day reference period**. Questions regarding the **"30-day reference period**" refer to the **30 days prior to the date that clinical signs were first observed** on the premises. You might find it helpful to have a calendar and your records handy.

a. Today's date (mm/dd/yyyy): _____ date1

b. Date first clinical signs observed (mm/dd/yyyy): _____ date2

c. Date 30-days **before** first clinical signs observed (mm/dd/yyyy): _____ date3

All questions that ask about the "30-day reference period" refer to the dates between b. and c. above.

Section A – Premises Information

National Premises Identification Number: _____ premid

Name of premises: _____ premname

Address of premises:

Street: _____ premstreet

City:_____premcity Zip Code:_____premzip State:--_____premstate

County of premises: _____ premcnty

Corporate affiliation/cooperative membership: _____ premcorp

Premises owner contact name: _____ ownname

Primary phone: _____ ownph Email: _____ owneml

Premises manager name: _____ mgrname

Primary phone: _____ mgrph Email: _____ mgreml

Premises veterinarian name: _____ vetname

Primary phone: _____ vetph Email: _____ veteml

Interviewee contact name: _____ weename

Primary phone: _____ weeph Email: _____ weeeml

Interviewer contact name: _____ wername

Primary phone: _____ werph Email: _____ werem

Click "File Name Generator" and Copy the field below it, then click "Save As" button, and paste as file name.

File Name Generator

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Section B – Case Information

1. For all cattle that have ever exhibited clinical signs of this syndrome, what clinical sign(s) were observed? *[Check **all** that apply.]* d0001

Lactation related clinical signs:

☐a Decreased milk production

☐b Abnormal milk (e.g., consistency, color)

☐c Dry off early

Respiratory related clinical signs:

☐i Increased respiratory rate

☐j Labored breathing

☐k Nasal discharge

☐l Blood from nose

☐m Pneumonia

Digestive related clinical signs:

☐d Decreased feed consumption

☐e Decreased rumen motility

☐f Diarrhea/Loose manure

☐g Tacky, dry manure

☐h Constipation

Other clinical signs:

☐n Neurological signs

☐o Blisters or ulcers

☐p Abortions

☐q Lameness

☐r Fever (103 °F or greater)

☐s Dehydration

☐t Other (specify: _____d0001oth)

2. For lactating cows with this syndrome that have produced abnormal milk, were any of the following characteristics observed? *[Check **all** that apply.]* d0002

☐a Yellow discoloration

☐b Grey discoloration

☐c Clear

☐d Apparent blood in milk

☐e Thickened

☐f Flakes

☐g Clots

☐h Other (specify: _____d0002oth)

3. On average, for cattle on this premises that have shown clinical signs of this syndrome:
   a. How many days did they show clinical signs (excluding milk drop)?..... d0003_____# days
   b How many days did they experience milk drop? ..... d0004_____# days
4. When was the first time a veterinarian collected samples from cattle on this premises to diagnose the cause of clinical signs due to this syndrome? ..... d0005 _____ mm/dd/yy

5. Please complete the following table for the class and number of cattle on this operation **today**. "Recovered" is defined as returning to the milking string even if there is not a full return to the previous level of milk production; or, if non-lactating, are no longer receiving supportive care or appear healthy. *(Enter number of animals in whole numbers)*

Cattle class	**How many animals of this class are on the premises?** *(If 0, go to next class; if >0, continue this class)*	**Have any animals of this class exhibited clinical signs to date?** *(If No, go to next class; if Yes, continue this class)*	**How many animals of this class have exhibited clinical signs to date?**	**How many animals of this class have recovered from this syndrome?**	**How many animals of this class have been culled due to this syndrome?**	**How many animals of this class have died due to this syndrome?**
a. Preweaned dairy or beef calves	_____ d0006	☐1 Yes ☐3 No d0016	_____ d0025	_____ d0035	_____ d0045	_____ d0055
b. Weaned but not bred dairy heifers	_____ d0007	☐1 Yes ☐3 No d0017	_____ d0026	_____ d0036	_____ d0046	_____ d0056
c. Bred dairy heifers	_____ d0008	☐1 Yes ☐3 No d0018	_____ d0027	_____ d0037	_____ d0047	_____ d0057
d. 1st lactation dairy cows	_____ d0009	☐1 Yes ☐3 No d0019	_____ d0028	_____ d0038	_____ d0048	_____ d0058
e. 2nd lactation dairy cows	_____ d0010	☐1 Yes ☐3 No d0020	_____ d0029	_____ d0039	_____ d0049	_____ d0059
f. 3rd or greater lactation dairy cows	_____ d0011	☐1 Yes ☐3 No d0021	_____ d0030	_____ d0040	_____ d0050	_____ d0060
g. Dry dairy cows	_____ d0012	☐1 Yes ☐3 No d0022	_____ d0031	_____ d0041	_____ d0051	_____ d0061
h. Beef cows, bulls, steers, and heifers	_____ d0013	☐1 Yes ☐3 No d0023	_____ d0032	_____ d0042	_____ d0052	_____ d0062
i. Dairy bulls	_____ d0014	☐1 Yes ☐3 No d0024	_____ d0033	_____ d0043	_____ d0053	_____ d0063
j. Total (a. – i.)	0 _____ d0015		0 _____ d0034	0 _____ d0044	0 _____ d0054	0 _____ d0064

6. During the reference period, were any dairy heifers from this premises being raised off-site with retained ownership? ..... d0065 ☐1 Yes ☐3 No

   a. If Yes, which of the following best describes the off-site rearing facility? *[Check only **one**.]* d0066

   Dairy heifers are sent to:

   ☐1 A **single rearing facility** and **do not have any contact** with cattle from other operations.

   ☐2 **Multiple rearing facilities** and **do not have any contact** with cattle from other operations.

   ☐3 A **single rearing facility** and **have contact** with cattle from other operations.

   ☐4 **Multiple rearing facilities** and **have contact** with cattle from other operations.

   ☐5 Other (specify: _____ d0066oth)

7. How many pens are on this premises? ..... d0067_____ # pens

8. Have clinical signs been observed in multiple pens? ..... d0068 ☐1 Yes ☐3 No

[If Yes, continue. If No, go to Section C.]

   a. How many pens have animals that have exhibited clinical signs to date? . d0069 _____ # pens

   b. For each affected pen, what was the first day clinical signs were observed in the pen, the pen number, the cattle class of the pen, and the average days in milk for cattle in the pen?
   (If more space is needed, please use the continuation table at the end of the questionnaire. If possible, please attach labeled site map. Enter average days in whole numbers)

Date clinical signs were first observed in the pen (mm/dd/yy)	Pen number	Cattle class	Pen average days in milk
_____ d0070a	_____ d0070b	_____ d0070c	_____ d0070d
_____ d0071a	_____ d0071b	_____ d0071c	_____ d0071d
_____ d0072a	_____ d0072b	_____ d0072c	_____ d0072d
_____ d0073a	_____ d0073b	_____ d0073c	_____ d0073d
_____ d0074a	_____ d0074b	_____ d0074c	_____ d0074d
_____ d0075a	_____ d0075b	_____ d0075c	_____ d0075d

Click to go to Continuation Table

c. Have animals showing clinical signs been observed in: *[Check **all** that apply.]* d0076

☐a Adjacent pens?

☐b Non-adjacent pens?

☐c Other (specify: _____ d0076oth)

d. For pens with lactating cows, has the order that pens have first shown clinical signs followed the same order that those pens visit the milking parlor? ..... d0077 ☐1 Yes ☐3 No ☐4 Don't Know

e. If Yes, please describe:

_____ d0078oth

Section C – Herd Description

1. During the **30-day reference period**, which one of the following practices best describes this dairy operation? *[Check only **one**.]* d0100

☐1 Conventional (majority of forage consumed is not harvested by cows)

☐2 Grazing (majority of forage consumed is harvested by cows during the growing season)

☐3 Combination of conventional and grazing

☐4 Other (specify: _____ d0100oth)

2. Of the dairy cows on this operation today, approximately what percent are:

a. Holstein?. ..... d0101 _____ %

b. Jersey? ..... d0102 _____ %

c. Other, including mixed dairy breeds? (specify:_____ d0103oth) d0103 _____ %

Total (should equal 100%) 0 %

3. Is this premises producing **raw** milk or **raw/unpasteurized** milk cheese products for human consumption or for a cow share program? ..... d0104 ☐1 Yes ☐3 No

4. Is this premises certified organic? ..... d0105 ☐1 Yes ☐3 No

5. During the **30-day reference period**, what was the primary housing type used for each of the following types of cattle while on this operation?

[Insert the appropriate housing type code from the table below.]

Housing type codes			
1	Individual outside hutch/pen	5	Freestall with or without access to open/dry lot
2	Individual inside hutch/pen – heated or nonheated calf barn	6	Open/dry lot/multiple animals outside area with or without barn or shed (excludes pasture)
3	Tie stall or stanchion	7	Multiple animals inside area/barn
4	Pasture	8	Other (specify in Other column according to cattle type)

Other (specify)

a. Preweaned dairy heifers. .....d0107/d0107oth _____

b. Weaned, but not bred, dairy heifers. .....d0108/d0108oth _____

c. Bred dairy heifers. .....d0109/d0109oth _____

d. Lactating cows. .....d0110/d0110oth _____

e. Dry cows. .....d0111/d0111oth _____

6. During the **30-day reference period**, were the following animal types present on this operation? If Yes, have any of these animal types been sick or died? Were any of the following animal types present on an adjacent operation(s) where fence-line contact with this operation's cattle was possible?

Animal type	**On this operation?** (If Yes, answer **Sick** column; if No, go to **Adjacent Operation** column)	**Have any animals of this type been sick or died?**	**On an adjacent operation where fence-line contact with this operation's cattle was possible?**
a. Dairy cattle			☐1 Yes ☐3 No ☐4 Don't know d0132
b. Beef cattle	☐1 Yes ☐3 No d0112	☐1 Yes ☐3 No d0122	☐1 Yes ☐3 No ☐4 Don't know d0133
c. Chickens or other poultry	☐1 Yes ☐3 No d0113	☐1 Yes ☐3 No d0123	☐1 Yes ☐3 No ☐4 Don't know d0134
d. Horses, donkeys, mules, or similar	☐1 Yes ☐3 No d0114	☐1 Yes ☐3 No d0124	☐1 Yes ☐3 No ☐4 Don't know d0135
e. Pigs (domestic)	☐1 Yes ☐3 No d0115	☐1 Yes ☐3 No d0125	☐1 Yes ☐3 No ☐4 Don't know d0136
f. Pigs (feral)	☐1 Yes ☐3 No d0116	☐1 Yes ☐3 No d0126	☐1 Yes ☐3 No ☐4 Don't know d0137
g. Sheep	☐1 Yes ☐3 No d0117	☐1 Yes ☐3 No d0127	☐1 Yes ☐3 No ☐4 Don't know d0138
h. Goats	☐1 Yes ☐3 No d0118	☐1 Yes ☐3 No d0128	☐1 Yes ☐3 No ☐4 Don't know d0139
i. Dogs (domestic or feral)	☐1 Yes ☐3 No d0119	☐1 Yes ☐3 No d0129	☐1 Yes ☐3 No ☐4 Don't know d0140
j. Cats (domestic or feral)	☐1 Yes ☐3 No d0120	☐1 Yes ☐3 No d0130	☐1 Yes ☐3 No ☐4 Don't know d0141
k. Other (specify:_____) d0121oth	☐1 Yes ☐3 No d0121	☐1 Yes ☐3 No d0131	☐1 Yes ☐3 No ☐4 Don't know d0142

7. Are there any commercial poultry operations located within 5 miles of this operation's cattle herd? ..... d0143 ☐1 Yes ☐3 No ☐4 Don't Know

8. During the **30-day reference period**, where were this operation's dead cattle disposed? *[Check only **one**.]* d0144

☐1 On-site

☐2 Off-site

☐3 Both

☐4 Not applicable – no deaths

Section D – Milking Procedures

1. What type of milking facilities are used on this operation? *[Check **all** that apply.]* d0201

☐a Parlor

☐b Tie stall or stanchion barn

☐c Robotic/voluntary milking systems

☐d Other (specify: _____ d0201oth)

2. During the **30-day reference period**, how many times per day were the majority of cows milked? *[Check only **one**.]* d0202

☐1 Once a day

☐2 Twice a day

☐3 Three times a day

☐4 More than three times a day

3. Are all cows milked the same number of times per day? ..... d0203 ☐1 Yes ☐3 No

a. If No, does the frequency of milking seem to be associated with clinical signs? (i.e., has there been a difference in the number of cows with clinical signs based on the number of times they were milked per day?) ..... d0204 ☐1 Yes ☐3 No ☐4 Don't know

(1). If Yes to Question 3.a., please explain: _____ d0205oth

4. During the **30-day reference period**, were the teats sprayed with water or another solution, excluding pre-teat dip, prior to milking? ..... d0206 ☐1 Yes ☐3 No

5. During the **30-day reference period**, was forestripping performed prior to milking? ..... d0207 ☐1 Yes ☐3 No

6. During the **30-day reference period**, were teats pre-dipped prior to milking? ..... d0208 ☐1 Yes ☐3 No

[If Yes, continue. If No, go to Question 7.]

a. Please specify product used: _____ d0209oth

b. What method was used to apply pre-dip? *[Check only **one**.]* d0210

☐1 Teat dipping cup

☐2 Teat sprayer

☐3 Automatic brush with scrubber and dryer

☐4 Other (specify: _____ d0210oth)

7. During the **30-day reference period**, how were the teats dried prior to milking? *[Check **all** that apply.]* d0211

☐a Paper towel used on one cow only

☐b Paper towel used on more than one cow

☐c Cloth towel used on one cow only

☐d Cloth towel used on more than one cow

☐e Not applicable – teats were not dried

8. During the **30-day reference period**, were teats post-dipped after milking?..... d0212 ☐1 Yes ☐3 No

a. If Yes, please specify product used: _____ d0213oth

9. During the **30-day reference period,** did this operation use a backflush system in milking units?

..... d0214 ☐1 Yes ☐3 No

a. If Yes, was the backflush system:

(1). Used for every milking? ..... d0215 ☐1 Yes ☐3 No

(2). Automatic or manual? ..... d0216 ☐1 Automatic ☐2 Manual

(3). Does the backflush system include a disinfectant? ..... d0217 ☐1 Yes ☐3 No

10. During the **30-day reference period**, did parlor workers wear disposable gloves while milking cows?

..... d0218 ☐1 Always ☐2Sometimes ☐3Never

a. If Always or Sometimes, on average how many cows were contacted while wearing a single pair of gloves? *[Check only **one**.]* d0219 ☐1 Only 1 ☐2 2–10 ☐3 11–50 ☐4 51–100 ☐5 101+

[If this operation has a parlor, continue. If not, go to Question 13.]

11. During the **30-day reference period**, was the parlor cleaned after each milking shift?

..... d0220 ☐1Always ☐2Sometimes ☐3Never

a. If Always or Sometimes, which of the following best describes the cleaning procedures? *[Check only **one**.]* d0221

☐1 Wash parlor with water or steam only

☐2 Chemically disinfect only

☐3 Wash with water and chemically disinfect

☐4 Other (specify: _____ d0221oth)

12. Does this operation use a CIP (clean in place) system? ..... d0222 ☐1 Yes ☐3 No

    a. If Yes, how many times a day is cleaning conducted? *[Check only **one**.]* d0223

    ☐1 1

    ☐2 2

    ☐3 3

    ☐4 4 or more

13. Have any of the milking or parlor practices changed since the syndrome was first observed on this premises? ..... d0224 ☐1 Yes ☐3 No

    a. If Yes, please explain: _____ d0225oth

14. During the **30-day reference period**, did milk trucks pick up partial semi-truck loads from this dairy? .....d0226 ☐1 Yes ☐3 No ☐4 Don't Know

15. During the **30-day reference period**, approximately how much waste milk was produced daily on this premises? ..... d0227 _____ (gallons/day)

16. During the **30-day reference period**, which of the following practices were used to dispose of waste milk on this premises? For each practice used, was the waste milk pasteurized/heat treated, chemical treated, or not treated prior to the disposal practice?

Practice to dispose of waste milk: (If checked, answer Treatment column) *[Check **all** that apply.]* d0228	**Treatment prior to the disposal practice?** *[Check **all** that apply.]*
☐a Fed to calves on this dairy	☐a Pasteurized/ heat treated ☐b Chemical treatment ☐c No treatment d0229
☐b Fed to calves at another premises	☐a Pasteurized/ heat treated ☐b Chemical treatment ☐c No treatment d0230
☐c Fed to swine (on or off-site)	☐a Pasteurized/ heat treated ☐b Chemical treatment ☐c No treatment d0231
☐d Fed to cats/dogs on the dairy	☐a Pasteurized/ heat treated ☐b Chemical treatment ☐c No treatment d0232
☐e Disposed in lagoon	☐a Pasteurized/ heat treated ☐b Chemical treatment ☐c No treatment d0233
☐f Other (specify:_____) d0228oth	☐a Pasteurized/heat treated ☐b Chemical treatment ☐c No treatment d0234

17. Have the waste milk disposal and/or waste milk treatment practices changed since the syndrome was first observed on this premises? ..... d0235 ☐1 Yes ☐3 No

a. If Yes, how have practices changed: _____ d0236oth

Section E – Animal Movements

1. Were animals of the following cattle classes **added** to this premises during the **30-day reference period**?

Cattle class	Added to the premises during the 30-day reference period?
a. Preweaned dairy or beef calves	☐1 Yes ☐3 No d0301
b. Weaned but not bred dairy heifers	☐1 Yes ☐3 No d0302
c. Bred dairy heifers	☐1 Yes ☐3 No d0303
d. Fresh dairy heifers	☐1 Yes ☐3 No d0304
e. Lactating dairy cows	☐1 Yes ☐3 No d0305
f. Dry dairy cows	☐1 Yes ☐3 No d0306
g. Beef cows, bulls, steers, heifers	☐1 Yes ☐3 No d0307
h. Dairy bulls	☐1 Yes ☐3 No d0308

2. Please describe all movements of cattle **onto** this premises beginning with the start of the 30-day reference period.
(Answer all columns for each movement. If more space is needed, please use the continuation table at the end of the questionnaire.)

Date of movement (mm/dd/yy)	Cattle class/type	Number of head	Origin (premises/farm name, city, state)
_____ d0309a	_____ d0309b	_____ d0309c	_____ d0309d
_____ d0310a	_____ d0310b	_____ d0310c	_____ d0310d

_____ d0311a	_____ d0311b	_____ d0311c	_____ d0311d
_____ d0312a	_____ d0312b	_____ d0312c	_____ d0312d
_____ d0313a	_____ d0313b	_____ d0313c	_____ d0313d

Click to go to Continuation Table

3. Were animals of the following cattle classes **removed** from the premises during the **30-day reference period** or **since clinical signs were first observed**? *[Answer **both** columns.]*

Cattle class	Removed from the premises during the 30-day reference period?	Removed from the premises since clinical signs were first observed?
a. Preweaned dairy or beef calves	☐1 Yes ☐3 No d0314	☐1 Yes ☐3 No d0322
b. Weaned but not bred dairy heifers	☐1 Yes ☐3 No d0315	☐1 Yes ☐3 No d0323
c. Bred dairy heifers	☐1 Yes ☐3 No d0316	☐1 Yes ☐3 No d0324
d. Fresh dairy heifers	☐1 Yes ☐3 No d0317	☐1 Yes ☐3 No d0325
e. Lactating dairy cows	☐1 Yes ☐3 No d0318	☐1 Yes ☐3 No d0326
f. Dry dairy cows	☐1 Yes ☐3 No d0319	☐1 Yes ☐3 No d0327
g. Beef cows, bulls, steers, heifers	☐1 Yes ☐3 No d0320	☐1 Yes ☐3 No d0328
h. Dairy bulls	☐1 Yes ☐3 No d0321	☐1 Yes ☐3 No d0329

4. Please describe all movements of cattle **off** this premises beginning with the start of the 30-day reference period.
(Answer all columns for each movement. If more space is needed, please use the continuation table at the end of the questionnaire.)

Date of movement (mm/dd/yy)	Cattle class/type	Number of head	Destination (premises/farm name, city, state)
d0330a	d0330b	d0330c	d0330d
d0331a	d0331b	d0331c	d0331d
d0332a	d0332b	d0332c	d0332d
d0333a	d0333b	d0333c	d0333d
d0334a	d0334b	d0334c	d0334d

Click to go to Continuation Table

5. During the **30-day reference period**, how often were the following types of cattle isolated (kept physically separated) before being comingled with this operation's cattle?
   (Check NA if not applicable, i.e., did not have cattle return and/or join during the time frame.)
   a. Cattle returning to the operation? ..... d0335 ☐1 Always ☐2 Sometimes ☐3 Never ☐4 NA
   b. New cattle joining the operation (permanently or temporarily)?
   ..... d0336 ☐1 Always ☐2 Sometimes ☐3 Never ☐4 NA

[If Questions 5. a. and b. BOTH are Never or NA, go to Question 7.]

6. How many days were these types of cattle typically isolated?
   (Check NA if not applicable, i.e., did not have cattle return and/or join during the time frame.)
   a. Cattle returning to the operation? ..... d0337 _____ # days ☐4 NA
   b. New cattle joining the operation (permanently or temporarily)?
   ..... d0338 _____ # days ☐4 NA
7. During the **30-day reference period**, did any cattle leave this operation for any purpose (e.g., veterinary clinic, show, sale, petting zoo, or similar) and then return to this operation?
   ..... d0339 ☐1 Yes ☐3 No

Section F – Operation Management

1. During the **30-day reference period**, which of the following describes your standard colostrum feeding practices for calves? *[Check only **one**.]* d0401

   ☐1 Unpasteurized cow colostrum from a single dam

   ☐2 Pasteurized cow colostrum from a single dam

   ☐3 Unpasteurized pooled cow colostrum

   ☐4 Pasteurized pooled cow colostrum

   ☐5 Commercial colostrum replacer

   ☐6 Calves are not fed colostrum

2. Which of the following liquid diets are calves fed prior to weaning? *[Check **all** that apply.]* d0402

   ☐a Medicated/Nonmedicated milk replacer

   ☐b Unpasteurized milk

   ☐c Pasteurized milk

   ☐d Acidified milk

   ☐e Other (specify: _____ d0402oth)

3. What are the water sources for cattle?

   a. Off-site fresh water (e.g., municipal, community, commercial) ..... d0403 ☐1 Yes ☐3 No

   b. Well ..... d0404 ☐1 Yes ☐3 No

   c. Surface water (e.g., pond, canal)..... d0405 ☐1 Yes ☐3 No

   d. Other (specify:_____ d0406oth) ..... d0406 ☐1 Yes ☐3 No

4. Are water treatments (e.g., chlorination) used in the drinking water for the cattle on this operation?

   ..... d0407 ☐1 Yes ☐3 No

   a. If Yes, are these treatments conducted: ..... d0408 ☐1 Continuously? ☐3 Intermittently?

5. During the **30-day reference period**, which best describes how frequently the water delivery systems (e.g., water tank or trough, waterer) were drained and cleaned? *[Check only **one**.]* d0409

   ☐1 Daily ☐2 Weekly ☐3 2-3 times per month ☐4 Never

For the next two questions, "Always" is 100% of the time, "Most of the time" is 51–99% of the time, "Sometimes" is 1–50% of the time, and "Never" is 0% of the time.

6. During the **30-day reference period**, how often were wild birds observed in/around sources from which the cows drink? *[Check only **one**.]* d0410

   ☐1 Always ☐2 Most of the time ☐3 Sometimes ☐4 Never

7. Where are feed rations fed at this dairy being mixed? *[Check only **one**.]*

   ..... d0411 ☐1 At this dairy ☐2 At a location off-site ☐3 Both

8. Do feed components include:

   a. Feather/other poultry meal ..... d0412 ☐1 Yes ☐3 No ☐4 Don't Know

b. Poultry litter/manure ..... d0413 ☐1 Yes ☐3 No ☐4 Don't Know

c. Other poultry byproducts ..... d0414 ☐1 Yes ☐3 No ☐4 Don't Know

(1). If Yes, specify: _____ d0415oth

9. During the **30-day reference period**, how frequently were wild birds, wild animals, and rodents able to access cattle feed or feed ingredients (e.g., feed spillage, open bag, cover left open, feedline, commodity bays)? *For the next two questions, "Always" is 100% of the time, "Most of the time" is 51–99% of the time, "Sometimes" is 1–50% of the time, and "Never" is 0% of the time.*

Animal type	Always	Most of the time	Sometimes	Never
a. Large birds (e.g., waterfowl such as ducks and geese, raptors such as hawks) d0416	☐1	☐2	☐3	☐4
b. Small birds (e.g., finches, sparrows, starlings, pigeons, blackbirds, grackles, cowbirds) d0417	☐1	☐2	☐3	☐4
c. Wild animals (e.g., raccoons, opossums, coyotes, feral swine, deer, rabbits, foxes) d0418	☐1	☐2	☐3	☐4
d. Rodents (e.g., rats, mice, squirrels, gophers) d0419	☐1	☐2	☐3	☐4

10. During the **30-day reference period**, did this operation ever transport cattle in trucks and/or trailers shared with other livestock operations? ..... d0420 ☐1 Yes ☐3 No

[If No, go to Question 13.]

11. Were shared trucks or trailers cleaned prior to use? ..... d0421 ☐1 Yes ☐3 No

12. Which of the following best describes the cleaning procedures? *[Check only **one**.]* d0422

☐1 Wash vehicle with water or steam only

☐2 Chemically disinfect only

☐3 Wash vehicle and chemically disinfect

☐4 Other (specify: _____ d0422oth)

13. During the **30-day reference period**, did this operation ever use the same equipment to handle manure and feed? ..... d0423 ☐1 Yes ☐3 No

[If No, go to Question 17.]

14. Were separate buckets used to handle manure and feed? ..... d0424 ☐1 Yes ☐3 No

15. Was equipment (excluding separate buckets) cleaned between use for manure and use for feed? ..... d0425 ☐1 Yes ☐3 No

16. If Yes to Question 15, which of the following best describes the cleaning procedures? *[Check only **one**.]* d0426

☐1 Wash equipment with water or steam only

☐2 Chemically disinfect only

☐3 Wash equipment and chemically disinfect

☐4 Other (specify: _____ d0426oth)

17. What kind(s) of bedding are used on this dairy? *[Check **all** that apply.]* d0427

☐a Wood shavings and/or sawdust

☐b Straw and/or hay

☐c Sand

☐d Rice hulls

☐e Paper

☐f Compost and/or dried manure

☐g Rubber mats/mattress

☐h Other (specify: _____ d0427oth)

18. Prior to use, is fresh bedding accessible to:

a. Wild birds ..... d0428 ☐1 Yes ☐3 No

b. Wild animals (e.g., raccoons, opossum, coyotes, foxes)..... d0429 ☐1 Yes ☐3 No

c. Domestic animals (e.g., dogs, cats)..... d0430 ☐1 Yes ☐3 No

19. What type of water is used to flush the alleys? *[Check **all** that apply.]* d0431

☐a Lagoon or recycled flush water

☐b Surface pond water

☐c Municipal water

☐d Well water

☐e None

☐f Other (specify: _____ d0431oth)

20. During the **30-day reference period** or **since clinical signs were first observed**, was manure on this operation: *[Answer **both** columns.]*

	30-day reference period	**Since clinical signs were first observed**
a. Stored on premises?	☐1 Yes ☐3 No d0432	☐1 Yes ☐3 No d0436
b. Composted for bedding?	☐1 Yes ☐3 No d0433	☐1 Yes ☐3 No d0437

c. Applied to land managed by this premises?	☐1 Yes ☐3 No d0434	☐1 Yes ☐3 No d0438
d. Removed, sold, or given away?	☐1 Yes ☐3 No d0435	☐1 Yes ☐3 No d0439

21. During the **30-day reference period**, was manure or used bedding from other premises brought onto this operation? ..... d0440 ☐1 Yes ☐3 No ☐4 Don't Know

Questions 22–26 refer to persons such as the producer, employees, farm help, crews, or similar.

22. What is the total number of employees working on this operation that have access to or directly work with the cattle (including family, both paid and unpaid)? ..... d0441 _____ #

23. During the **30-day reference period**, did any workers on this operation visit another dairy premises? ..... d0442 ☐1 Yes ☐3 No ☐4 Don't know

24. During the **30-day reference period**, did any workers on this operation visit livestock shows or 4-H events? ..... d0443 ☐1 Yes ☐3 No ☐4 Don't know

25. Are any workers or members of their households employed by any of the following:

	Other dairy operations?	Swine farms?	Poultry farms?	Other livestock operations?
a. Workers	☐1 Yes ☐3 No ☐4 Don't know d0444	☐1 Yes ☐3 No ☐4 Don't know d0446	☐1 Yes ☐3 No ☐4 Don't know d0448	☐1 Yes ☐3 No ☐4 Don't know d0450
b. Members of household	☐1 Yes ☐3 No ☐4 Don't know d0445	☐1 Yes ☐3 No ☐4 Don't know d0447	☐1 Yes ☐3 No ☐4 Don't know d0449	☐1 Yes ☐3 No ☐4 Don't know d0451

26. Do any employees own their own livestock and/or poultry, including small backyard herds/flocks? ..... d0452 ☐1 Yes ☐3 No ☐4 Don't know

27. During the **30-day reference period**, did any of the following types of people visit this operation? If Yes, how many times did they visit and did they have physical contact with the cattle?

Visitor type	Did they visit the operation? (If Yes, answer next two columns)	If Yes, How many times did they visit?	If Yes, Did this visitor have physical contact with cattle?
a. Veterinarian	☐1 Yes ☐3 No d0453	_____ d0453a	☐1 Yes ☐3 No d0453b
b. Nutritionist or feed consultant	☐1 Yes ☐3 No d0454	_____ d0454a	☐1 Yes ☐3 No d0454b
c. Breeding technician	☐1 Yes ☐3 No d0455	_____ d0455a	☐1 Yes ☐3 No d0455b

d. Feed or feed ingredient delivery personnel	☐1 Yes ☐3 No d0456	_____ d0456a	☐1 Yes ☐3 No d0456b
e. Milk hauler	☐1 Yes ☐3 No d0457	_____ d0457a	☐1 Yes ☐3 No d0457b
f. Contract hauler driver or vehicle (e.g., cattle, manure)	☐1 Yes ☐3 No d0458	_____ d0458a	☐1 Yes ☐3 No d0458b
g. Renderer	☐1 Yes ☐3 No d0459	_____ d0459a	☐1 Yes ☐3 No d0459b
h. Hoof trimmer	☐1 Yes ☐3 No d0460	_____ d0460a	☐1 Yes ☐3 No d0460b
i. Other (specify:_____) d0461oth	☐1 Yes ☐3 No d0461	_____ d0461a	☐1 Yes ☐3 No d0461b
j. Other (specify:_____) d0462oth	☐1 Yes ☐3 No d0462	_____ d0462a	☐1 Yes ☐3 No d0462b

28. During the **30-day reference period**, was a washroom with running water and soap available in the milking barn? ..... d0463 ☐1 Always ☐2 Sometimes ☐3 Never

Section G – Environmental Factors & Wild Birds

1. Are the following water body types visible or within 350 yards (about three football fields) of this operation?
   a. Pond or lake ..... d0501 ☐1 Yes ☐3 No
   b. Stream or river ..... d0502 ☐1 Yes ☐3 No
   c. Wetland or swamp ..... d0503 ☐1 Yes ☐3 No
   d. Wastewater lagoon ..... d0504 ☐1 Yes ☐3 No
   e. Standing water during the **30-day reference period** ..... d0505 ☐1 Yes ☐3 No
   f. Water ditch or canal ..... d0506 ☐1 Yes ☐3 No
   g. Other (specify:_____ d0507oth) ..... d0507 ☐1 Yes ☐3 No

[If Question 1.a. through g. are all No, go to Question 3.]

2. For those water bodies, including drainage ditches and lagoons within 350 yards of the operation, approximately how many wild waterfowl or shorebirds (e.g., ducks, geese, wading birds, gulls) were seen on the water during the **30-day reference period**? *[Check only **one**.]* d0508
   ☐1 None ☐2 Tens ☐3 Hundreds ☐4 Thousands ☐5 Don't know
3. What is the approximate distance (in yards) to the closest field where crops or hay are harvested? *[Check only **one**.]* d0509
   ☐1 50 yards or less ☐2 51–100 yards ☐3 101–350 yards ☐4 351 yards or more

4. For this closest field, approximately how many wild waterfowl or shorebirds (e.g., ducks, geese, wading birds, gulls) were seen during the **30-day reference period**? *[Check only **one**.]* d0510

☐1 None ☐2 Tens ☐3 Hundreds ☐4 Thousands ☐5 Don't know

5. During the **30-day reference period**, how frequently were the following types of wild birds **seen on the operation and within 100 yards of the cattle**?

For this question, "Often" is 51–100% of the time, "Sometimes" is 1–50% of the time, and "Never" is 0% of the time.

Bird type	Often	Sometimes	Never
a. Waterfowl (e.g., ducks, geese) d0511	☐1	☐2	☐3
b. Gulls d0512	☐1	☐2	☐3
c. Other water birds (e.g., egrets, cormorants) d0513	☐1	☐2	☐3
d. Pigeons and doves d0514	☐1	☐2	☐3
e. Blackbirds, crows, cowbirds, grackles d0515	☐1	☐2	☐3
f. Small perching birds (e.g., sparrows, starlings, swallows) d0516	☐1	☐2	☐3
g. Wild turkeys, pheasants, quail d0517	☐1	☐2	☐3
h. Raptors (e.g., eagles, hawks, owls, vultures) d0518	☐1	☐2	☐3
i. Other d0519 (specify: _____ d0519oth)	☐1	☐2	☐3

6. During the **30-day reference period**, did you or other farm workers observe any **sick or dead wild birds** on the premises? ..... d0520 ☐1 Yes ☐3 No

[If No, go to Question 7.]

a. Specify the type(s) of sick or dead birds: _____ d0521oth

b. Were any sick or dead birds tested for HPAI? ..... d0522 ☐1 Yes ☐3 No ☐4 Don't Know

(1) If Yes to Question 6.b., were any positive? ..... d0523 ☐1 Yes ☐3 No ☐4 Don't Know

7. During the **30-day reference period**, how often were the following wild animals, or evidence of their presence, seen on the premises?

For this question, "Often" is 51–100% of the time, "Sometimes" is 1–50% of the time, and "Never" is 0% of the time.

a. Wild mammals (e.g., raccoons, opossum, coyotes, foxes)
..... d0524 ☐1 Always ☐2 Sometimes ☐3 Never

b. Rodents (e.g., rats, mice, squirrels, gophers)..... d0525 ☐1 Always ☐2 Sometimes ☐3 Never

8. Does this premises have a written wildlife management plan that includes methods to minimize wildlife or wild bird entry and reduce wildlife attractants such as standing water?
..... d0526 ☐1 Yes ☐3 No

Comments Section

Please use this section for anything else you would like to add. For example, how do you think HPAI was/is spreading on your operation or in the geographic area? Is there something about your operation or your experience with this syndrome that you would like to share?d0601

Please attach any additional information you think would be valuable to this investigation, such as laboratory results prior to syndrome diagnosis, a site map with impacted pens labeled, full ration ingredient list, milk production records, hospital records, or the number of cows impacted per day.

Section B, Question 8.b. Continuation Table

Date clinical signs were first observed in the pen (mm/dd/yy)	Pen number	Cattle class	Pen average days in milk
d0080a	d0080b	d0080c	d0080d
d0081a	d0081b	d0081c	d0081d
d0082a	d0082b	d0082c	d0082d
d0083a	d0083b	d0083c	d0083d
d0084a	d0084b	d0084c	d0084d

Click to return to Section B

Section E, Question 2. Continuation Table

Date of movement (mm/dd/yy)	Cattle class/type	Number of head	Origin (premises/farm name, city, state)
d0350a	d0350b	d0350c	d0350d
d0351a	d0351b	d0351c	d0351d
d0352a	d0352b	d0352c	d0352d
d0353a	d0353b	d0353c	d0353d
d0354a	d0354b	d0354c	d0354d

d0355a	d0355b	d0355c	d0355d

Click to return to Section E

Section E, Question 4. Continuation Table

Date of movement (mm/dd/yy)	Cattle class/type	Number of head	Destination (premises/farm name, city, state)
d0360a	d0360b	d0360c	d0360d
d0361a	d0361b	d0361c	d0361d
d0362a	d0362b	d0362c	d0362d
d0363a	d0363b	d0363c	d0363d
d0364a	d0364b	d0364c	d0364d
d0365a	d0365b	d0365c	d0365d

Click to return to Section E

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APPENDIX B: FEDERAL ORDER REQUIRING TESTING FOR AND REPORTING OF HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI) IN LIVESTOCK: APRIL 24, 2024

On April 24, 2024, APHIS issued the Federal Order Requiring Testing for and Reporting of Highly Pathogenic Avian Influenza (HPAI) in Livestock. Full text is appended on the next page.

Federal Order Requiring Testing for and Reporting of Highly Pathogenic Avian Influenza (HPAI) in Livestock

April 24, 2024

The Animal and Plant Health Inspection Service (APHIS), United States Department of Agriculture (USDA), is issuing this Federal Order to prevent the spread of highly pathogenic avian influenza (HPAI). HPAI is a contagious viral disease of domestic poultry and wild birds. HPAI is deadly to domestic poultry and can wipe out entire flocks within a matter of days. HPAI is a threat to the poultry industry, animal health, human health, trade, and the economy worldwide. In the US, HPAI has now been detected in dairy cattle.

This Federal Order is issued in accordance with the regulatory authority provided by the Animal Health Protection Act, as amended, 7 U.S.C. § 8301 et seq. Section 8305 authorizes the Secretary of Agriculture to prohibit or restrict the movement in interstate commerce of any animal, article, or means of conveyance if the Secretary determines that the prohibition or restriction is necessary to prevent the introduction of any pest or disease of livestock into the United States or the dissemination of any pest or disease of livestock within the United States. Section 8308 authorizes the Secretary of Agriculture to carry out operations and measures to detect, control, or eradicate any pest or disease of livestock. Section 8315 authorizes the Secretary of Agriculture to issue orders as he determines necessary to carry out the Animal Health Protection Act. Should this Order be deemed a substantive rule, APHIS has determined that good cause exists to impose these requirements without notice and comment, as further delay would threaten to hasten the spread of the disease, multiplying the potential harm to livestock, poultry, the dairy industry, and, potentially, human health.

On February 8, 2022, the U.S. Department of Agriculture (USDA) confirmed HPAI H5N1virus in a commercial poultry flock in the United States. Since February 2022, USDA has worked swiftly with states and poultry producers to identify and respond to over 1,100 HPAI detections on poultry farms and mitigate the virus' impact on U.S. poultry production and trade.

Since late March 2024, the U.S. Department of Agriculture, Food and Drug Administration, Centers for Disease Control and Prevention, state veterinary and public health officials and the National Animal Health Laboratory Network (NAHLN) laboratories have been investigating the emergence of the HPAI, H5N1 virus in dairy cows. The National Animal Health Laboratory Network (NAHLN) is a nationally coordinated network and partnership of Federal, State and university-associated animal diagnostic laboratories. The laboratories are trained and proficiency tested by USDA's National Veterinary Services Laboratories (NVSL) to perform official federal animal health testing; the network provides ongoing disease surveillance, responds quickly to disease events, communicates diagnostic outcomes to decision makers, and has the capability and capacity to meet diagnostic needs during animal disease outbreaks.

APHIS will provide reimbursement for testing at NAHLN labs, including samples submitted for (1) dairy cattle suspected of disease due to clinical signs, (2) pre-movement testing, (3) producers interested in the disease status of their asymptomatic animals, and (4) samples taken from other animals on dairies associated with this disease event.

As of April 24, 2024, USDA has confirmed HPAI H5N1 clade 2.3.4.4b virus detections on 33 dairy cattle premises in 8 states (Kansas, Idaho, Michigan, New Mexico, North Carolina, Ohio, South Dakota, Texas). USDA has also confirmed - based on specific phylogenetic evidence and epidemiological information - that 8 poultry premises in 5 states (Kansas, Michigan, Minnesota, New Mexico and Texas) have also been infected with the same HPAI H5N1virus genotype detected in dairy cattle. Additionally, APHIS' National

Veterinary Services Laboratories found HPAI in a lung tissue sample from an asymptomatic cull dairy cow that originated from an affected herd and which did not enter the food supply.

HPAI has already been recognized as a threat by USDA, and the interstate movement of animals infected with HPAI is already prohibited. See 9 C.F.R. 71.3(b). However, the detection of this new distinct HPAI H5N1 virus genotype in dairy cattle poses a new animal disease risk for dairy cattle - as well as an additional disease risk to domestic poultry farms - since this genotype can infect both cattle and poultry.

In order to continue to monitor and understand the extent of this virus and reduce the risk of further disseminating HPAI H5N1 virus, resulting in greater threats to poultry and livestock, this Federal Order requires the following measures, effective Monday, April 29, 2024.

Mandatory Testing for Interstate Movement of Dairy Cattle

- Prior to interstate movement, dairy cattle are required to receive a negative test for Influenza A virus at an approved National Animal Health Laboratory Network (NAHLN) laboratory.
- Owners of herds in which dairy cattle test positive for interstate movement will be required to provide epidemiological information, including animal movement tracing.
- Dairy cattle moving interstate must adhere to conditions specified by APHIS.
- As will be described in forthcoming guidance, these steps will be immediately required for lactating dairy cattle, while these requirements for other classes of dairy cattle will be based on scientific factors concerning the virus and its evolving risk profile.

Mandatory Reporting

- Laboratories and state veterinarians must report positive Influenza A nucleic acid detection diagnostic results (e.g. PCR or genetic sequencing) in livestock to USDA APHIS.
- Laboratories and state veterinarians must report positive Influenza A serology diagnostic results in livestock to USDA APHIS.

For more information regarding this Federal Order go to HPAI Detections in Livestock Page.

APPENDIX C: APHIS REQUIREMENTS AND RECOMMENDATIONS FOR HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI) H5N1 VIRUS IN LIVESTOCK FOR STATE ANIMAL HEALTH OFFICIALS, ACCREDITED VETERINARIANS AND PRODUCERS: MAY 14, 2024

Full text of the Requirements and Recommendations is appended on the next page.

Please note: This situation is evolving rapidly; this is guidance is subject to change. Check back frequently for updated versions. The intended audience for this document is State Animal Health Officials, Accredited Veterinarians and Producers

APHIS Requirements and Recommendations for Highly Pathogenic Avian Influenza (HPAI) H5N1 Virus in Livestock For State Animal Health Officials, Accredited Veterinarians and Producers
May 14, 2024

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Highly Pathogenic Avian Influenza A (HPAI) H5N1 virus is an emerging disease in cattle. Federal and State agencies are moving quickly to conduct additional testing for HPAI (H5N1) virus, including viral genome sequencing to provide a better understanding of the situation to characterize the HPAI (H5N1) virus strain or strains associated with these detections as well as other components of this disease event at the connection between animals, people, and the environment. The genetic and epidemiological data indicate spillover of the virus from wild birds to dairy cows and some instances of spread from dairy to dairy and from dairy premises to poultry premises. Based on this analysis, we have learned that the whole genome sequence for virus found in positive herds in 8 states and on two recent commercial poultry premises in two different states indicates it is the same strain affecting both dairy cattle and poultry. While it is still unclear exactly how virus is spreading, the virus is shed in milk at high concentrations; therefore, anything that comes in contact with unpasteurized raw milk, spilled milk, etc. may spread the virus including other animals, vehicles, and other objects or materials. Therefore, both dairy and poultry producers should re-double biosecurity efforts and be vigilant about monitoring for and controlling disease in their herds and flocks.

Additionally, in order to continue to monitor and understand the extent of this virus and reduce the risk of further spread of HPAI H5N1, resulting in greater threats to poultry and livestock, APHIS issued a Federal Order on April 24, 2024 that requires premovement testing for lactating dairy cattle moving interstate and reporting of positive test results from all laboratories and State Animal Health Officials (SAHO). This document outlines both the interstate movement requirements, as well as APHIS recommendations to limit the spread. Updated laboratory guidance, including details on required reporting, are located on the APHIS website.

Our goal is to safeguard the health of U.S. livestock and poultry, protect the industry, keep our food supply safe, and protect public health and human safety based on the most up-to-date information we have. We continue to work diligently to understand the risk factors associated with this virus, transmission routes, and pathogenicity in cattle. This continues to be a rapidly evolving situation. USDA and Federal and State partners will continue to share additional updates as soon as information becomes available.

Scope and Definitions

Per the Federal Order, these steps are immediately required for lactating dairy cattle. Any requirements for other classes of dairy cattle, or expansion beyond dairy cattle, will be based on scientific factors concerning the virus and its evolving risk profile.

Definitions used in this document:

- Cattle – The requirements outlined within this guidance apply to the movement of members of the Family: Bovidae; Subfamily: bovinae; Genus: *Bos*; Species: *Bos taurus* and *Bos indicus*.
- Lactating – The requirements outlined within this guidance apply to the movement of dairy cows currently in one of the lactation phases (i.e., early, mid, and late) of their current production cycle.
- Dairy – The requirements outlined within this guidance apply to the movement of lactating cattle breeds raised for the primary purpose of milk production.
- Nonlactating – Nonlactating cattle include: heifers, dry cows, and bull calves.
- Affected herd – Any dairy cattle herd with suspect, presumptive, or confirmed positive cattle cases present as defined in the case definition, or exposed cattle present.
- Exposed cattle – Any cattle that have been on the same premises as an affected herd within the

last 30 days (which is roughly equivalent to two incubation periods of influenza in other species; we currently have studies underway in cattle to better determine) and/or are epidemiologically connected.

- Herd – Any group of one or more animals maintained on common ground

Clinical Signs in Dairy Cattle

See the case definition for a complete description. Briefly, dairy cattle may experience a sudden drop in feed intake; a marked drop in herd level milk production with some more severely affected cows having thickened milk or may have essentially no milk; subsequent acute drop in milk production; and respiratory signs including clear nasal discharge.

APHIS Requirements for Interstate Movement of Cattle

Interstate movements of lactating dairy cattle must follow the Federal requirements outlined below. Additionally, state-specific guidance for moving cattle must be followed. Clinical lactating dairy cattle are ineligible for interstate movement or movement to slaughter.

Nonlactating dairy cattle – including heifers, dry cows, and bull calves – are not currently subject to testing for interstate movement due to their risk profile.

Prior to interstate movement, lactating dairy cattle **are required to receive a negative test for Influenza A virus** at an approved National Animal Health Laboratory Network (NAHLN) laboratory using an NAHLN approved assay.

Sample Collection and Testing for Interstate Premovement Testing of Lactating Dairy Cattle

- Samples are to be collected by an accredited veterinarian, or a state licensed veterinarian, or a sample collector approved by the appropriate state animal health official. Designated individuals on production sites can be trained to collect milk samples and nasal swab samples for diagnostic testing.
- Samples must be collected under the supervision of a licensed or accredited veterinarian or as determined by the respective State Animal Health Official.
- Milk samples: Samples to be collected include milk/udder secretions from individual cows. Each quarter is sampled and combined into one sample for submission to the laboratory. Submissions must be between 3-10 ml of milk per animal.
    - Pooling of milk samples can be done only at the laboratory.
- For groups/lots of 30 or fewer animals moving interstate, all animals being moved must be tested. If more than 30 animals are moving interstate, then only 30 animals total must be tested.
- Sample collection and testing must take place no more than seven (7) days prior to interstate movement.
- Samples for interstate premovement testing need to be submitted to an approved National Animal Health Laboratory Network (NAHLN) Laboratory for testing. NAHLN laboratories will conduct NAHLN-approved PCR testing: FluA matrix, H5 and optionally 2.3.4.4b. Please see HPAI Livestock Testing Recommendations for details.

- APHIS will reimburse for all interstate premovement testing at NAHLN laboratories; therefore, this testing at NAHLN laboratories will be completed at no cost to the producer/submitter.
- At this time, APHIS is not reimbursing for sample collection or shipping.

For Cattle with Positive HPAI Test Results

- Lactating dairy cattle from herds which have tested positive for Influenza A are not eligible for interstate movement for thirty (30) days from the most recent collection of **any sample that tests positive from any individual animal in the herd**. After the 30-day period, animals must be tested again for movement.
- If there are specific circumstances for isolating test-positive cattle and moving to another premises across state lines, this would need to be discussed and agreed upon with the respective State Animal Health Officials and APHIS.

Cattle Moved Directly to Slaughter

- Nonclinical lactating dairy cattle moving interstate direct to slaughter are not required to have a premovement test but must move on a certificate of veterinary inspection or other documentation of movement approved by the sending and receiving state animal health officials and provided to the sending and receiving state animal health officials.
- Clinical lactating dairy cattle are ineligible for interstate movement or movement to slaughter.

Certificates of Veterinary Inspection

The interstate movement of all lactating dairy cattle **must be accompanied by a Certificate of Veterinary Inspection (CVI) per 9 CFR Part 86,** Animal Disease Traceability. The destination/receiving state(s) will continue to use CVIs as a basis to track the interstate movement of lactating dairy cattle.

- All cattle on the CVI must have individual official identification.
- The individual official identification must be recorded on the CVI.
- The CVI must include a statement that the cattle are both free from, and have not been exposed to, a known contagious and infectious disease.

Exhibition/Show Dairy Cattle

Requirements above for premovement testing and CVIs apply to dairy cattle moving interstate to exhibitions/shows. Animals moving interstate to an exhibition, show, or sale must have a negative test result from samples collected within 7 days of movement. These animals may travel to their home herd using the same negative test result provided the exhibition, show, or sale does not exceed 10 days of length. See also Recommendations to Minimize Influenza Transmission at Dairy Cattle Livestock Exhibitions.

APHIS Recommendations

Additional detailed actions are provided later in this document, subject to updates as information is gathered.

Cattle Movement Recommendations. In addition to the interstate movement requirements above, APHIS provides the following recommendations.

- APHIS strongly recommends minimizing movement of cattle as much as possible, with special

attention to evaluating risk and factoring that risk into movement decisions.

- If you have any animals with clinical signs on the premises, do not move animals off the premises.
- All animals that move on/off a premises should be isolated for 30 days to prevent the spread of disease.
- If cattle must be moved, we strongly encourage extreme diligence by producers, veterinarians, and States to ensure only healthy cattle are moving and to ensure the validity of interstate health certificates. APHIS stands ready to assist SAHOs with developing language for interstate certificates of veterinary inspection, as needed.
- APHIS recommends premovement testing of non-lactating cattle as well. This testing at NAHLN laboratories will be completed at no cost to the producer. Additional recommendations for testing can be found here.
- State-specific guidance for moving cattle will also need to be followed.
- APHIS scientists are working to establish testing protocols, rapidly assessing currently available tests and test performance including sample types to better understand the characteristics; based on this analysis, we may recommend testing for other classes of cattle beyond lactating dairy cows in the future.
- SAHOs should consider adopting the federal testing and movement requirements described above for intrastate movements of lactating dairy cattle to exhibitions or shows.

Biosecurity. Producers should implement enhanced biosecurity practices for keeping disease off farms and controlling disease spread on the farm. The Secure Milk Supply Plan is a collaborative initiative among the dairy industry, USDA, State officials and three universities. The Secure Milk Supply website offers comprehensive materials on dairy biosecurity practices, including posters and information sheets in English and Spanish. Additional biosecurity resources can be found at the following links below:

- Biosecurity - National Dairy FARM Program
- Biosecurity for dairy operations | TAMU
- Biosecurity for cattle operations | UMN Extension
- Farm Biosecurity - CFSPH (iastate.edu)

APHIS Recommendations for Highly Pathogenic Avian Influenza (HPAI) H5N1 Virus in Livestock for State Animal Health Officials, Accredited Veterinarians and Producers:

- **Monitoring for Sick Animals**. Producers should monitor herds closely for cattle with clinical signs of disease.
- **Movement of Cattle**. Movement of cattle should be minimized; movement of cattle should be focused on preventing movement of disease.
- **Vehicles, Equipment, and People on the Farm.** Producers should limit the movement of vehicles and visitors on and off livestock and poultry premises and establish dedicated routes for vehicles that do come onto the premises.
- **Wildlife Management**. Producers should monitor and report any odd behaviors and die offs in domestic and wild animals immediately.
- **Dairy Cattle Shows**. Organizers and exhibitors should practice strict biosecurity practices for animals and equipment to include frequent cleaning and disinfecting all equipment, avoiding contact with other animals, isolating animals and observing for illness upon return from shows.

Disposal of Deceased Birds, Cats, and Other Small Animals

- Producers should wear disposable gloves when handling any carcasses of birds or animals found on the farm.
- If there has been any potential human or animal exposure to rabies, contact your local health department for instructions; any cats that demonstrate neurologic signs should be submitted to the local public health laboratory for rabies testing.
- Producers should work with their veterinarian to submit dead birds and cats to a NAHLN laboratory for influenza testing.
- If dead cats cannot be submitted for rabies or influenza testing, thoroughly spray carcass with Virkon or equivalent disinfectant, double-bag and dispose in accordance with local and State laws. See AVMA guidelines or consult a veterinarian for animal carcass disposal practices.

Milk Safety. The Food and Drug Administration (FDA) recommends special attention to raw milk safety and handling practices for discarded milk. Additional resources available at Questions and Answers Regarding Milk Safety During Highly Pathogenic Avian Influenza (HPAI) Outbreaks | FDA.

- **Safety of Feeding Waste or Discarded Milk to Animals**. The FDA recommends producers discard milk from symptomatic cows. Young calves are susceptible to disease and disease-causing pathogens can be transmitted through raw milk. If milk from cows showing symptoms of illness, including those infected with HPAI A (H5N1), cannot be discarded and is intended to be used to feed calves (or other animals, such as farm cats), the FDA strongly encourages that it be heat treated to kill harmful bacteria or viruses, such as influenza, before calf feeding. This heat treatment should be similar to times and temperatures commonly found in commercial milk pasteurization processing.
- **Safety of Unpasteurized Milk and Dairy Products for Human Consumption**. Raw milk and raw milk dairy products should not be sold or distributed for human consumption.
- **Disposal of Discarded Milk**. Disposal of milk should be handled in such a way as to prevent exposure to other animals. The FDA recommends producers take precautions when discarding milk from affected cows so that the discarded milk does not become a source of further spread. Producers should consult with their state regulatory authorities for specific recommendations or requirements, however, such precautions could include heat-treatment or pasteurization of discarded milk prior to dumping in lagoons or application of waste solids and ensuring biosecurity around lagoons (e.g., ensuring that animals and birds do not have access to lagoons).
- **Segregation of Milk from Infected Lactating Cows**: Maximal care should be taken to segregate lactating cows known to be actively infected with H5N1 so their milk does not enter the food supply, consistent with the *Pasteurized Milk Ordinance*.

One Health: Agriculture and Public Health Collaboration. Monitoring farmers and farm workers with exposure to infected cattle is important to human and animal health. APHIS will continue to share information from their investigations as they coordinate with CDC, as has been standard procedure with influenza in poultry and swine. The Centers for Disease Control and Prevention (CDC) is working with state and local health departments to continue to monitor workers who may have been in contact with infected or potentially infected animals and test those people who develop symptoms.

People exposed to HPAI A (H5N1)-infected cattle, birds, or other animals (including people wearing recommended PPE) should be monitored daily for signs and symptoms of acute respiratory illness

beginning after their first exposure and for 10 days after their last exposure. Farms with HPAI-positive herds should implement farm-administered daily active monitoring using a simple symptom survey, that CDC provides to state and local public health agencies and that can also be made available directly to farmers.

On a daily basis, farms should share the aggregate number of staff who may have been exposed to infected cattle or other animals and are now being monitored for symptoms to a local public health department to a local public health department to maintain awareness of possible spillover infection.

Symptomatic persons should be referred to local public health for prompt medical evaluation, testing, and treatment, such as initiation of antiviral treatment with oseltamivir (Tamiflu) as soon as possible. Additional information related to public health monitoring and preventing exposures to H5N1 are available on CDC's website.

People should take steps to reduce the risk of infection with avian influenza A viruses associated with working with animals or materials like raw milk. Farms should follow CDC's guidance for workers, including the use of personal protective equipment to minimize the risk of on farm HPAI transmission. These recommendations and additional information can be found at the links below:

- Recommendations for Worker Protection and Use of Personal Protective Equipment (PPE) to Reduce Exposure to Novel Influenza A Viruses Associated with Severe Disease in Humans | Avian Influenza (Flu) (cdc.gov)
- Prevention and Antiviral Treatment of Bird Flu Viruses in People | Avian Influenza (Flu) (cdc.gov)

Producers with positive herds are encouraged to collaborate with local and state public health agencies, for example, permitting public health access conduct on-farm activities. Human and animal health experts have a pressing need to better understand the spread of H5N1 and how the virus manifests and might impact both animal and human health. There is no substitute for capturing real-time information from farmers and farmworkers who are or have experienced symptoms through surveys and monitoring of key health indicators. Willing producers and farmworkers should contact their local public health agency.

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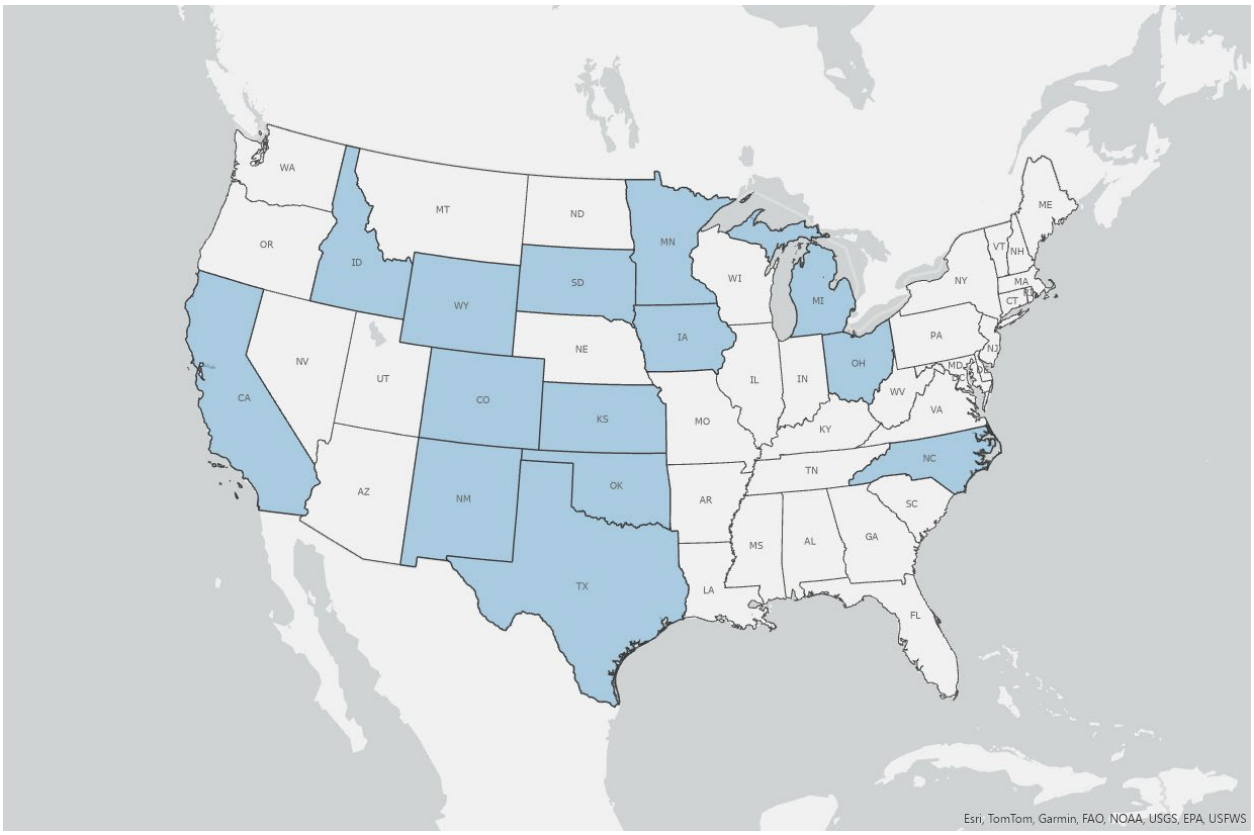

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Center for Epidemiology and Animal Health
2150 Centre Avenue, Bldg. B, Fort Collins, CO, 80526-8117
Web: https://www.aphis.usda.gov/livestock-poultry-disease/epidemiology