

Tales From the Field

Regional Veterinary Perspective

HPAI OUTBREAK INVESTIGATION

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HPAI OUTBREAK THEN VERSUS NOW...

2014 – 2015 H5Nx (N2/N8)	2022 – 2023 H5N1	2024 – current H5N1	Feb 2022 – July 2024 H5N1
232 detections in domestic poultry (211 commercial, 21 BYP)	805 detections in domestic poultry (322 commercial, 483 BYP)	70 detections in domestic poultry (33 commercial, 37 BYP)	1171 detections in domestic poultry (508 commercial, 663 BYP)
75 wild bird detections	>6000 wild bird detections	649 wild bird detections	9674 wild bird detections
21 states, 15 with wild bird detections	47 states, 49 with wild bird detections	25 states, 50 with wild bird detections	50 states, 50 with wild bird detections
50.4 million poultry dead/ depopulated	>58.6 million poultry dead/ depopulated	8.81 million poultry dead/ depopulated	100.72 million birds dead/ depopulated
Independent wild bird-origin virus in ~30% poultry cases	Independent wild bird-origin virus in ~85% poultry cases	Independent wild bird-origin virus in <i>unknown</i> poultry cases	Independent wild bird-origin virus in <i>unknown</i> poultry cases
Virus disappeared in 2016	Ongoing with detections in carnivorous mammals	Ongoing with non-carnivorous mammalian detections	Ongoing with detections in various species of animals

Detections of Highly Pathogenic Avian Influenza in Wild Mammals *

* Locations are approximate based on the county of detection and may represent multiple detections.

SPECIES AFFECTED



National Wildlife Disease Program
 USDA/APHIS/Wildlife Services
 Published April 30, 2024
 Data Source: State Agencies, USDA
 Map created by: Jourdan Ringenberg



- Flyway**
- Atlantic
 - Central
 - Mississippi
 - Pacific

- Species**
- Big cat (captive)
 - Bobcat
 - Mountain lion
 - Black bear
 - Brown bear
 - Polar bear
 - Bottlenose dolphin
 - Grey seal
 - Harbor seal
 - Coyote
 - Red fox
 - American marten
 - Fisher
 - Mink
 - North American river otter
 - Abert's squirrel
 - Raccoon
 - Skunk spp.

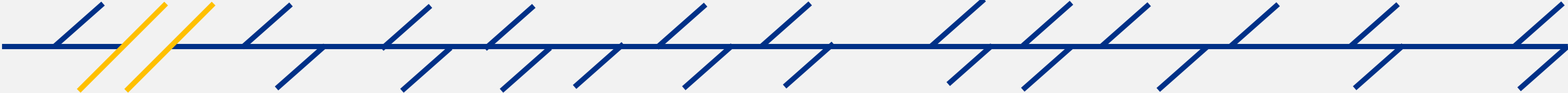
* Map depicts wild and captive wild mammal detections only.

0 800 Miles



Timeline of Dairy Outbreak Animal Lab Results

Mid-Feb: Unknown illness affects dairy cattle in the Texas Panhandle

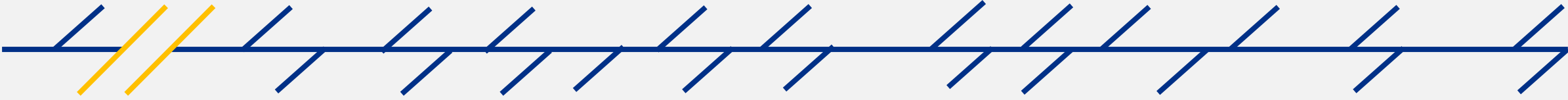




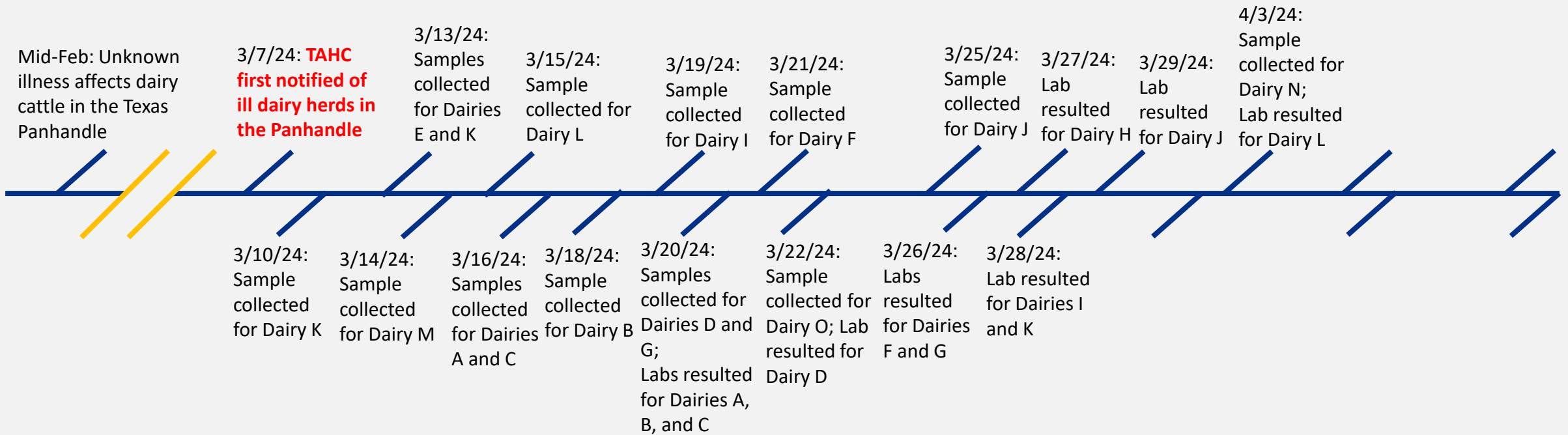
Timeline of Dairy Outbreak Animal Lab Results

Mid-Feb: Unknown illness affects dairy cattle in the Texas Panhandle

3/7/24: **TAHC first notified of ill dairy herds in the Panhandle**

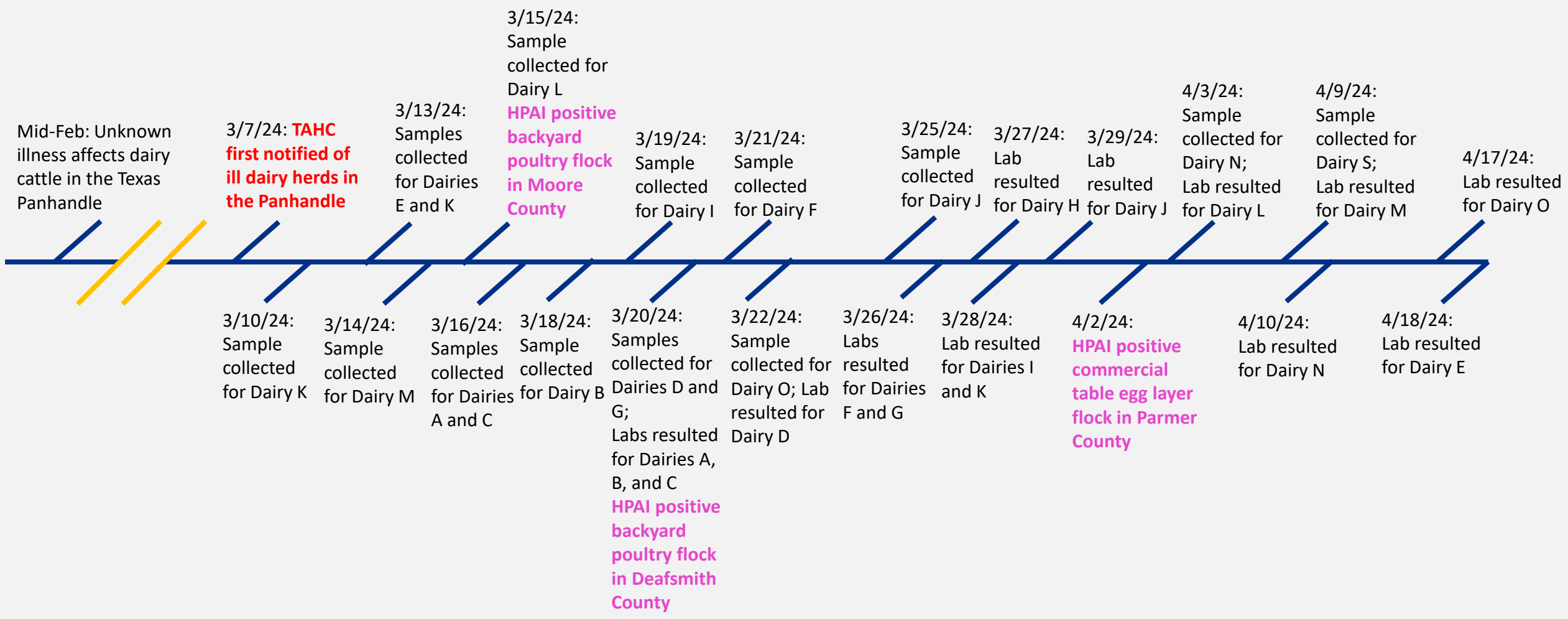


Timeline of Dairy Outbreak Animal Lab Results



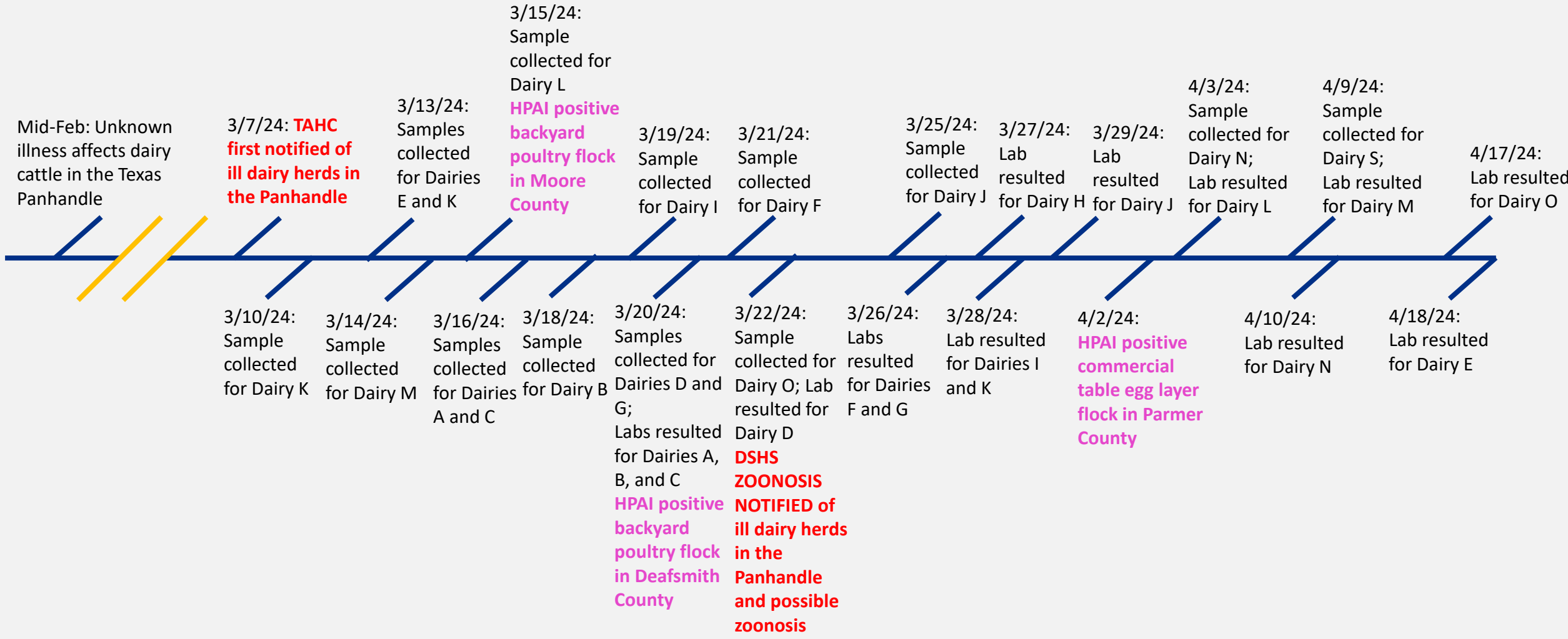


Timeline of Dairy Outbreak Animal Lab Results





Timeline of Dairy Outbreak Animal Lab Results

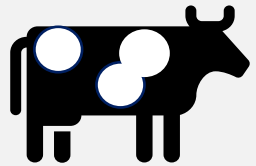


Herd Demographics

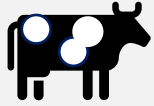
Mid to late lactation cows

Predominantly 2nd lactation or older

Some open / bred



Clinical Signs



Decreased rumination

Hyperthermia (104 - 108 F)

Indigestion

Dehydration

Anorexia

Decreased lactation

Changes in milk consistency

Yellow and thick like colostrum

Pneumonia*

Diarrhea*



Blindness -> Ataxia -> Circling ->
Death* within 12 – 24 hours



Disorientation -> Flying into dark
places (milking parlor) -> Death*
within 12 - 24



Disease Progression

Duration of clinical signs: ~ 15 days

Peak signs between 2 and 5 days

10 – 15% of cows in herd affected

Mortality < 1%

10 – 20 lbs milk loss (herd average)

Sustained for ~ 3 weeks before slowly returning to production



Diagnostic Plan

Differentials

Coronavirus

Leptospirosis

Salmonella

Respiratory pathogens (viral and bacterial)

Mastitis pathogens (environmental and mycoplasma)

Mineral imbalance

Heavy metal exposure

Influenza D

Diagnostic Test Recommendations

CBC/CHEM/UA

Corona virus PCR

Mycoplasma PCR

Leptospirosis PCR

Fecal Culture

Milk Culture

Mineral and Metal Panel

Viral BRD PCR

Bacterial BRD PCR





Test Results

Banked cattle samples from cases tested (samples from 3/10 - 4/5)

172 milk samples	(50% non-negative)
40 whole blood samples	(0%)
22 urine samples	(13%)
17 fecal samples	(0%)
5 nasal swabs	(20%)
5 serum samples	(0%)
4 mammary glands	(100%)
5 lung samples	(60%)
6 lymph nodes	(66.7%)

Premises	Contacted?	Sample Collection Date (species)	Herd Size	Case Status	Human (pos/n)	as of 4/2/24	Vet ID	Bovines tested	Environmental Samples Tested
Dairy 1A	Dr. AH spoke with vet. Vet will speak with dairy manager/owners	3/16/2024 (avian)		Suspected		offered and persons were no show in Dumas	Vet A		1/1 blackbird positive
Dairy 1B	Yes (by Milk Group)	3/18/2024 (avian)		Suspected		talked the vet and he reported no symptomatic persons on the dairy	Vet B		2/2 grackles positive
Dairy 1C	Dr. AH spoke with vet. Vet will speak with dairy manager/owners	3/16/2024 (avian)		Suspected		offered and persons were no show in Dumas	Vet A		1/1 wild bird positive
Dairy 1D	Dr. AH spoke with vet. Vet will speak with dairy manager/owners	3/20/2024 (bovine)	1000	Confirmed (milk)		offered and persons were no show in Dumas	Vet A	7/8 positive	
Dairy 1E	Dr. AH spoke with vet. Vet will speak with dairy manager/owners	3/20/2024 (avian) 3/21/2024 (bovine) 3/22/2024 (feline)	4700	Confirmed (milk)	0/13	vet worked with DSHS	Vet C Vet D	18/20 (milk; 2 QCF) 1/1 nasal swab	1/1 feline positive 1/1 pigeon positive 1/1 grackle pool positive
Dairy 1F	Tonya Finch called twice and left VM. Dr. AH called three times and left VM. No call back	3/21/2024 (bovine)		Confirmed (mam gl)		called 3 times	Vet E	1/1 positive	
Dairy 1G	Tonya Finch called twice and left VM. Dr. AH called three times and left VM. No call back	3/20/2024 (bovine)	3850	Confirmed (milk)		called 3 times, hung up	Vet F	5/20 positive	
Dairy 1H	Tonya Finch called twice and left VM. Dr. AH called three times and left VM. No call back	3/13/2024 (bovine)		Confirmed (milk)			Vet G	31/33 positive (2 QCF)	
Dairy 1I	Dr. AH spoke with vet. Vet will speak with dairy manager/owners	3/19/2024 (bovine) 3/19/2024 (feline) 3/20/2024 (feline)	3000	Confirmed (milk)		offered and persons were at no show in Dumas	Vet A	7/8 positive	5/5 felines positive
Dairy 1J	Dr. AH spoke with vet. Vet will speak with dairy manager/owners	3/25/2024 (bovine)		Confirmed (milk)			Vet H	2/38 positive (others not tested)	
Dairy 1K	Tonya Finch called twice and left VM. Dr. AH called three times and left VM. No call back	3/10/2024 (bovine)	3925	Confirmed (milk)			Vet E	5/19 sample types positive (negative small intestine and lymph node; all positives were milk)	
Dairy 1L	Contacted	3/15/2024 (bovine)		Confirmed (lung, mam gl, lymph node)			Vet I	6/6 positive (lung, mammary gland x4, lymph node)	
Dairy 1M	Yes	3/14/2024 (bovine)	7000	Confirmed (milk)			Vet J	1/1 positive	
Dairy 1N	Yes	4/3/2024 (bovine)		Confirmed (milk)			Vet I	3/3 positive	
Dairy 1O	Yes	03/22/2024 (bovine)		Confirmed (lymph node)			Vet J	1/4 positive	
Dairy 1P	Yes	04/20/2024 (bovine)		Confirmed (milk)			Vet K	24/30 positive (milk)	
Dairy 1Q		(bovine)		Confirmed (milk)			Vet L	1/2 positive (milk)	
Dairy 1R		5/13/2024 (bovine)		Confirmed (milk)			Vet L	10/10 positive (milk)	

Affected premises
A premises where there are animals with clinically compatible signs and symptoms, and a related sample that was non-negative sample by PCR for influenza virus

Case status
Confirmed:
A confirmed premises is defined as a premises with a sample from a bovine that was PCR positive for influenza
Suspect:
A suspect premises is defined as a premises with a sample from of non-bovine origin (e.g. migratory birds, feral cats, etc.) that was PCR positive for influenza



Human Illness Suspected

Dairy veterinarians observed the following in the dairy employees:

Palpebral edema

Periorbital edema

Conjunctivitis

Scleral injection

Serous or mucopurulent ocular discharge

*Veterinarians reported that the affected employees were working exclusively with sick cattle

*Photos not allowed to be used without prior written permission



Patient

25-year-old-male,
Hispanic descent

PE: HR 98 bpm, BP 159/
98, SPO2 97%, TEMP 98.3
F, Weight not obtained

CS: OD episcleral injection
and serous ocular
discharge of 12 hours
duration

HX: Been working with
sick cattle the day before.
Did not wear goggles or a
mask. Only gloves.



Photo courtesy of Dr. Cherissa Abdul Hamid



Photo courtesy of Dr. Scott Milton

DSHS PRESS RELEASE

DSHS Reports First Human Case of Avian Influenza in Texas

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 NEWS RELEASE

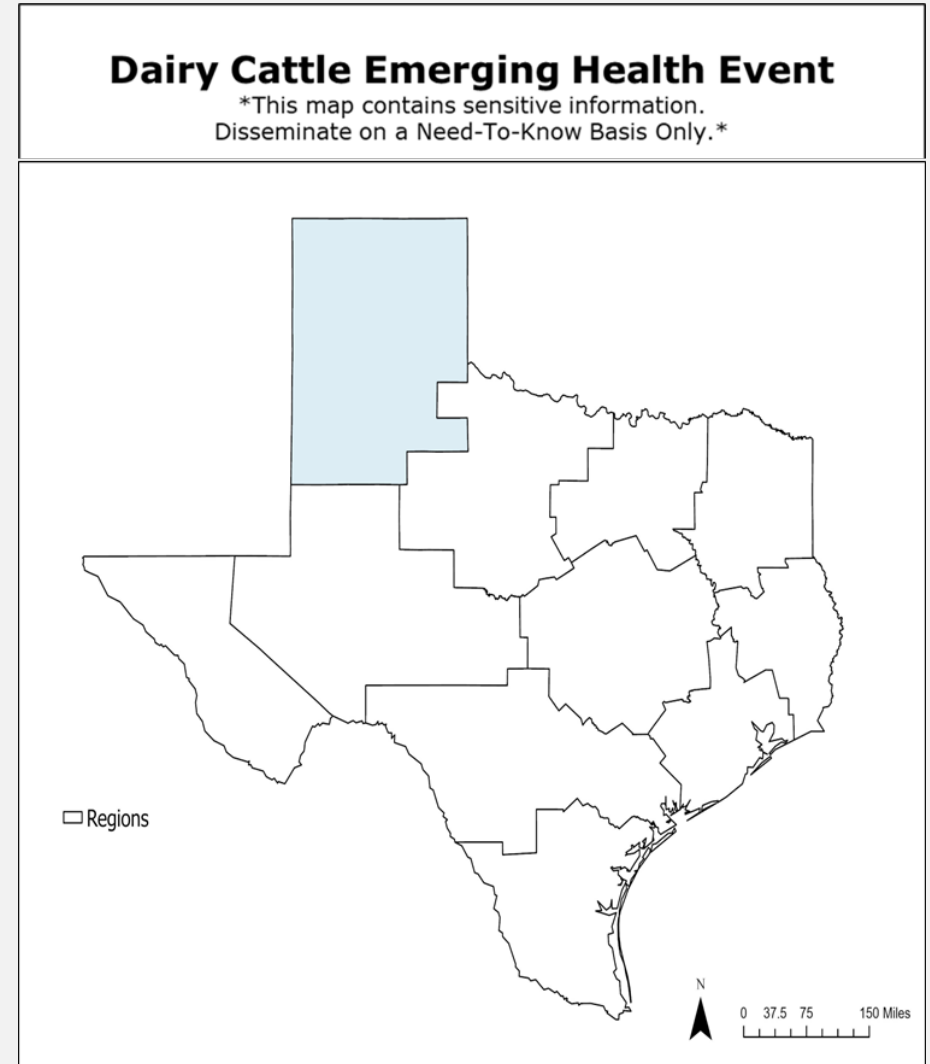
April 1, 2024

Person Had Direct Contact With Dairy Cattle

The Texas Department of State Health Services is reporting a human case of avian influenza A(H5N1) virus in Texas. The case was identified in a person who had direct exposure to dairy

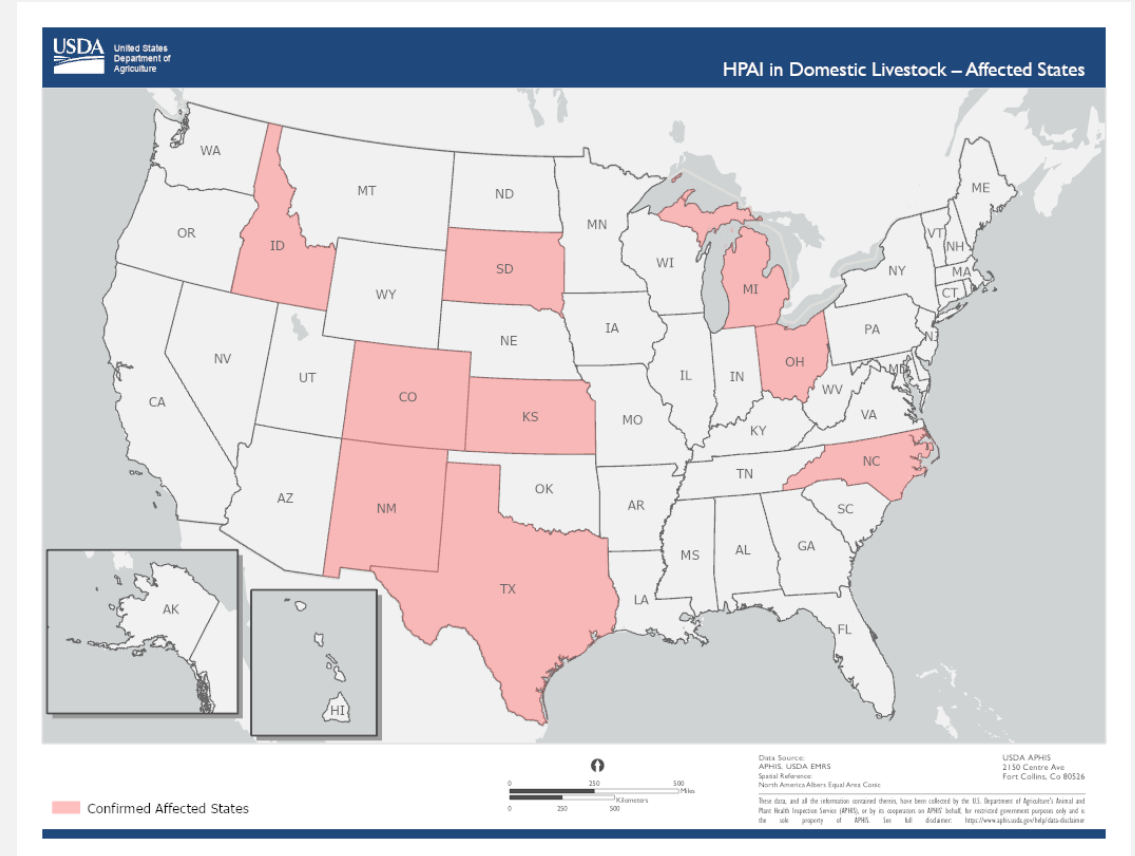
Results in Texas

- As of 5/20/24:
 - 16 affected premises have been reported in Texas
 - 13 Confirmed premises that have a positive lab result from a bovine
 - 3 Suspected premises that have a positive lab result from another source (e.g. feline, avian)
 - One human case reported
 - Occupational exposure at a dairy



United States Cases

- As of 5/20/24:
 - 9 states reporting affected cattle
 - Additional states report H5N1 detection in poultry
 - Thought to be related to spillover from bovines
 - Some H5N1 detections in avian and mammalian wildlife



Map of states with affected dairy cattle. USDA. Accessed on May 14, 2024



Timeline of Response Activities

3/7/24:

TAHC first notified of ill dairy herds in the Panhandle

4/22/24:

USDA releases 239 WGS

4/20/2024:

Sample collected from Dairy P





Timeline of Response Activities

3/7/24:

TAHC first notified of ill dairy herds in the Panhandle

4/22/24:

USDA releases 239 WGS

4/20/2024:
Sample collected from Dairy P

4/24/24:
USDA APHIS movement order announced

4/29/24:
USDA APHIS requires HPAI testing of dairy cattle prior to interstate transport



USDA APHIS Movement Order

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.



USDA APHIS Movement Order

- Support for Producers
 - Biosecurity planning and implementation
 - Offset the cost for shipping samples for influenza A testing at laboratories in the National Animal Health Laboratory Network (NAHLN)
 - Heat treatment to dispose of milk in a bio secure fashion
 - Reimbursement for veterinarian costs associated with confirmed positive HPAI premises
 - Reimbursement of costs associated with the purchase of PPE
 - Milk loss offset via the Farm Service Agency (FSA)

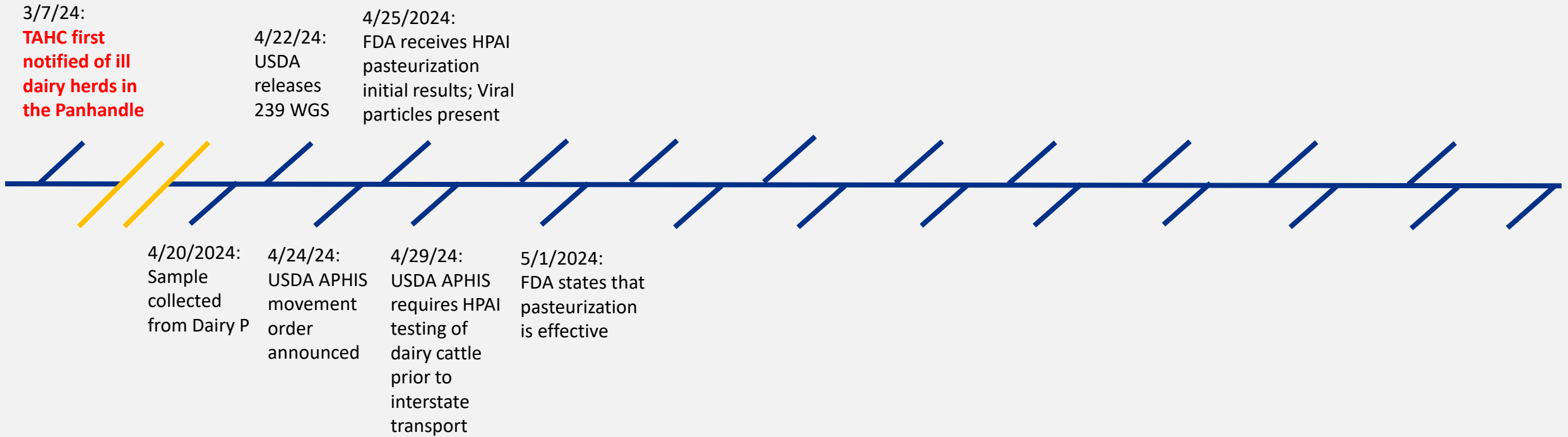


USDA Farm Service Agency (FSA)

- Emergency Assistance for Livestock, Honeybees and Farm-Raised Fish Program (ELAP)
- Updated ELAP eligibility regulations include:
 - Milk losses due to the Highly Pathogenic Avian Influenza (HPAI) H5N1 virus in dairy herds

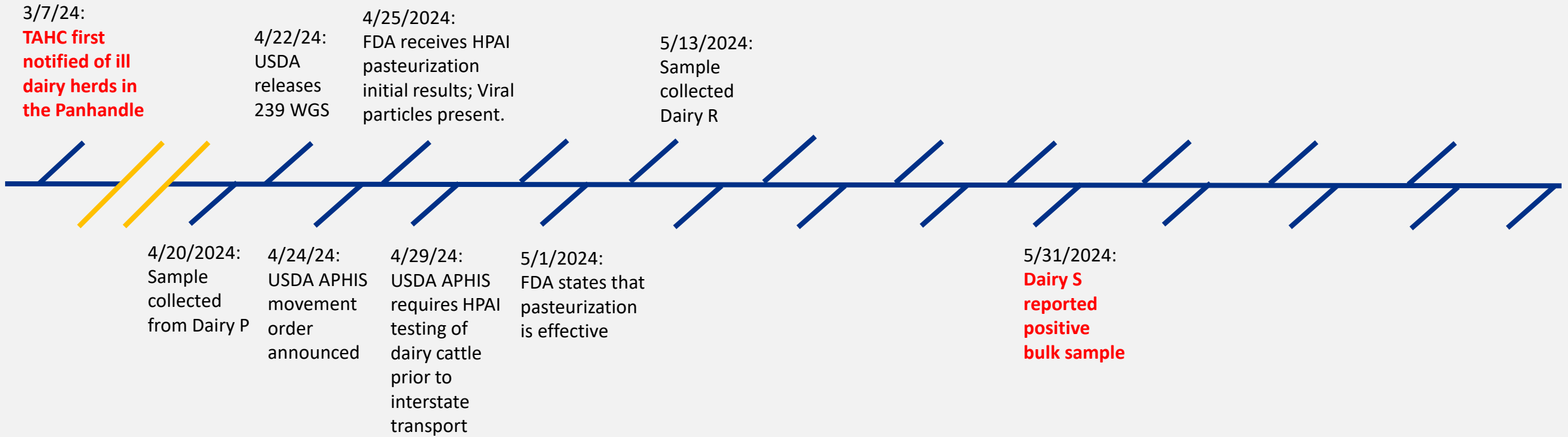


Timeline of Response Activities



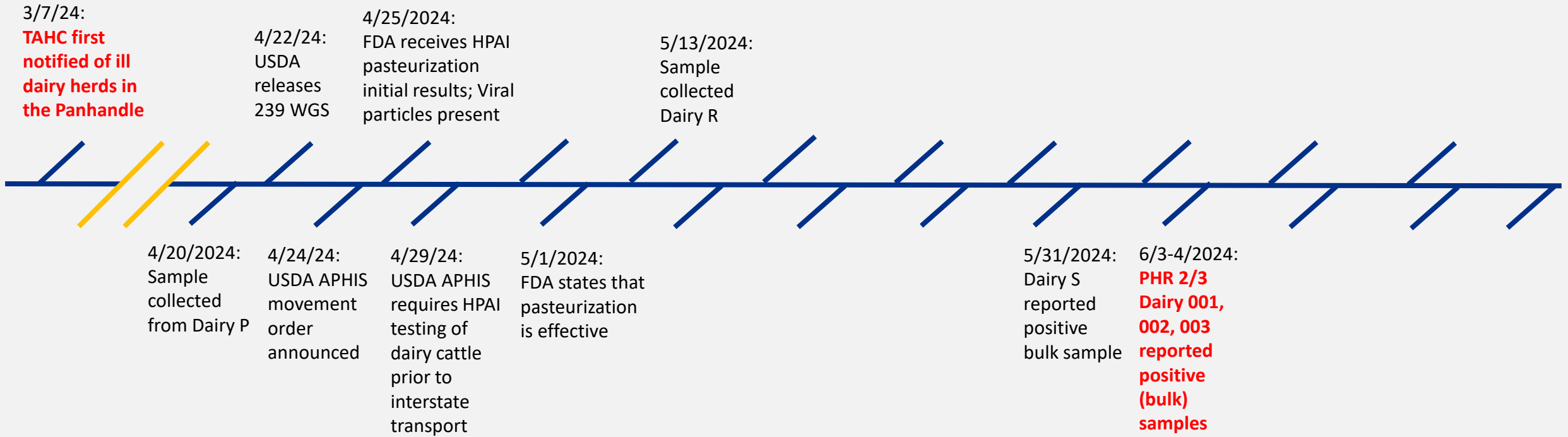


Timeline of Response Activities



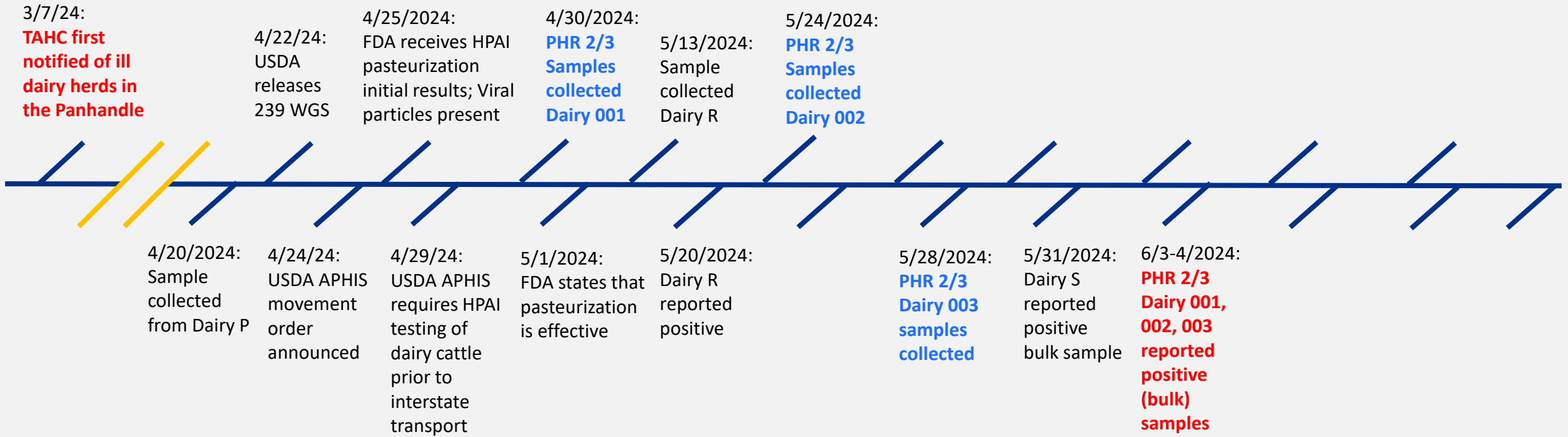


Timeline of Response Activities



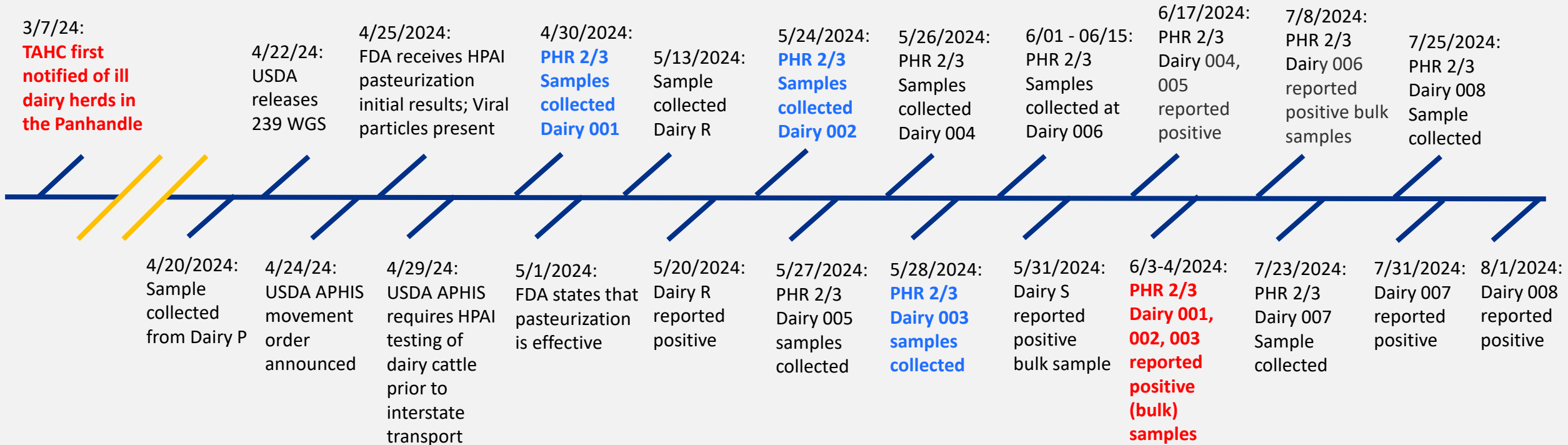


Timeline of Response Activities

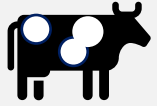




Timeline of Response Activities



Clinical Signs



ADR

Decreased lactation

Changes in milk consistency

Yellow and thick like colostrum

Dehydration



Neurologic -> Death*

Disappearance



Not reported



Ocular redness



Premises	Contacted?	Sample Collection Date (species)	Herd Size	Case Status	Human (pos/n)	Vet ID	Bovines tested	Environmental Samples Tested
Dairy 23_001	Yes - Dr. Marlar	4/30/2024 (bovine)	990	Confirmed (milk)	n	Vet 2/3A	3/3 positive (milk)	n
Dairy 23_002	Yes - Dr. Marlar	5/24/2024 (bovine)	3000	Confirmed (milk)	n	Vet 2/3B	3/3 positive (milk)	n
Dairy 23_003	Yes - Dr. Marlar	5/28/2024 (bovine)	3-4K	Confirmed (milk)	n	Vet 2/3C	4/4 positive (milk)	n
Dairy 23_004	Yes - Dr. Marlar	5/26/2024 (bovine)	390	Confirmed (milk)	n	Vet 2/3A	3/3 positive (milk)	n
Dairy 23_005	Yes - Dr. Marlar	5/27/2024 (bovine)	2200	Confirmed (milk)	n	Vet 2/3A	6/6 positive (milk)	n
Dairy 23_006	Yes - Dr. Marlar	7/1/2024 (bovine)	800	Confirmed (milk)	n	Vet 11	2/3 positive (milk)	n
Dairy 23_007	Yes - Dr. Marlar	7/23/2024 (bovine)	2400	Confirmed (milk)	n	Vet 2/3A	3/7 positive (2 individual and 1 pooled sample)	n
Dairy 23_008	Message left	07/15/2024, 07/25/2024 (bovine)		Confirmed (milk)		Vet 2/3C	2/2 positive (bulk tank milk -pooled sample)	

Affected premises

A premises where there are animals with clinically compatible signs and symptoms, and a related sample that was non-negative sample by PCR for influenza virus

Case status

Confirmed:

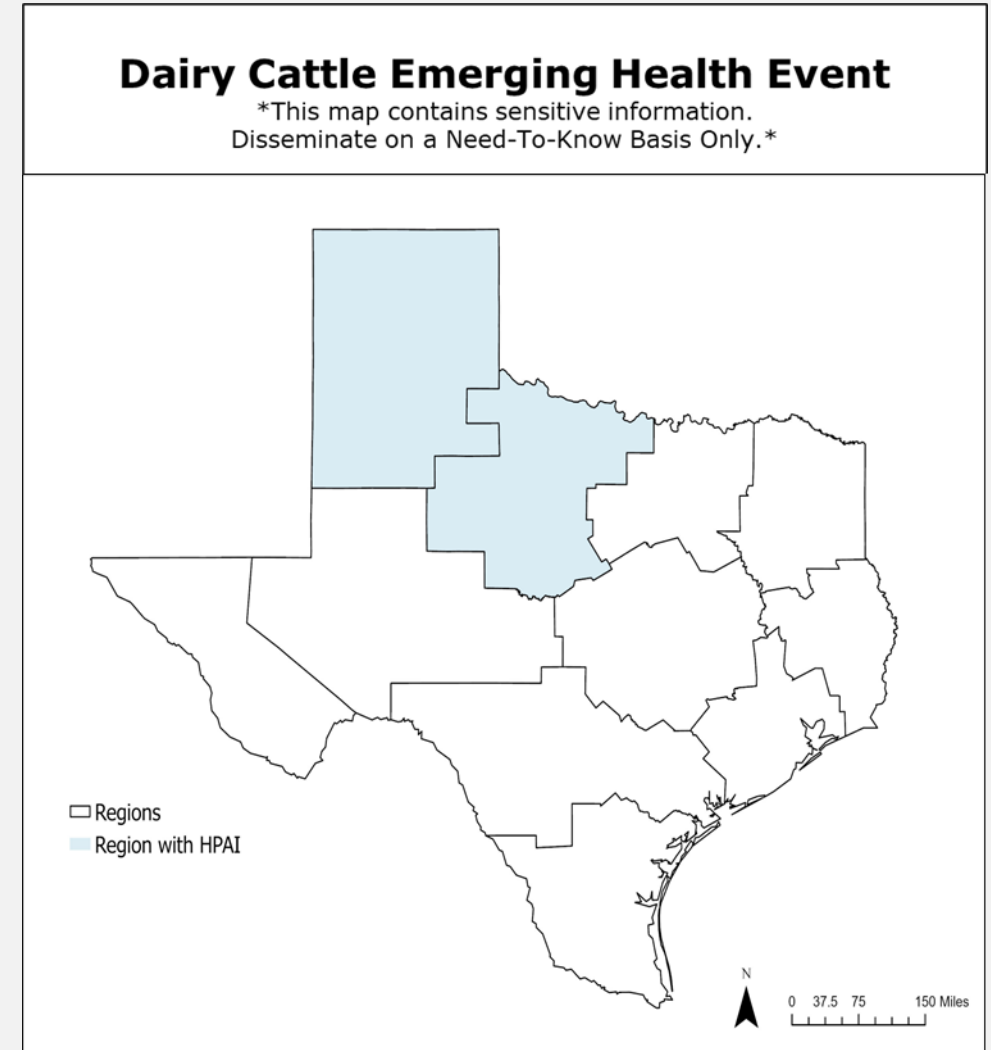
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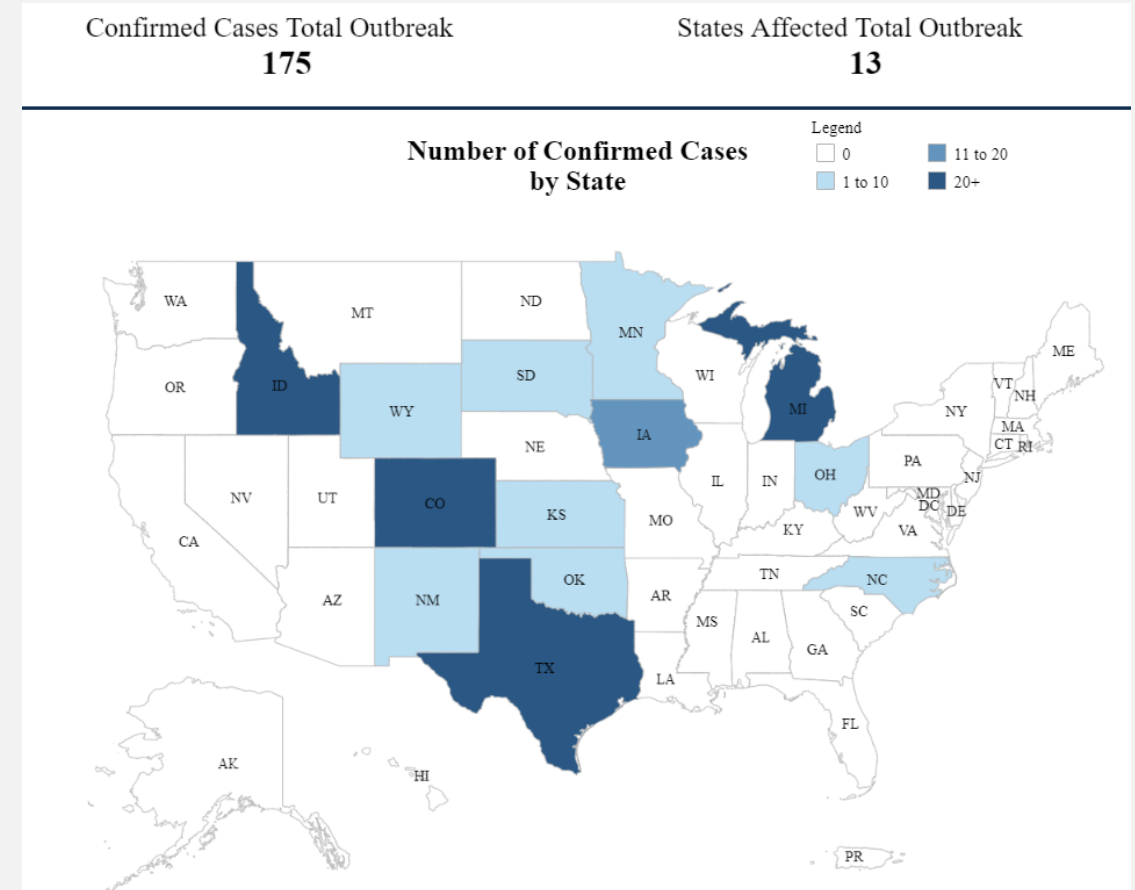
Results in Texas

- As of 8/2/24:
 - 24 affected premises have been reported in Texas
 - 21 Confirmed premises have a positive lab result from a bovine
 - 3 Suspected premises have a positive lab result from another source (e.g. feline, avian)
 - One human case reported
 - Occupational exposure at a dairy



United States Cases

- As of 7/31/24:
 - 13 States reporting affected cattle
 - Additional states report H5N1 detection in poultry
 - Thought to be related to spillover from bovines
 - Some H5N1 detections in avian and mammalian wildlife



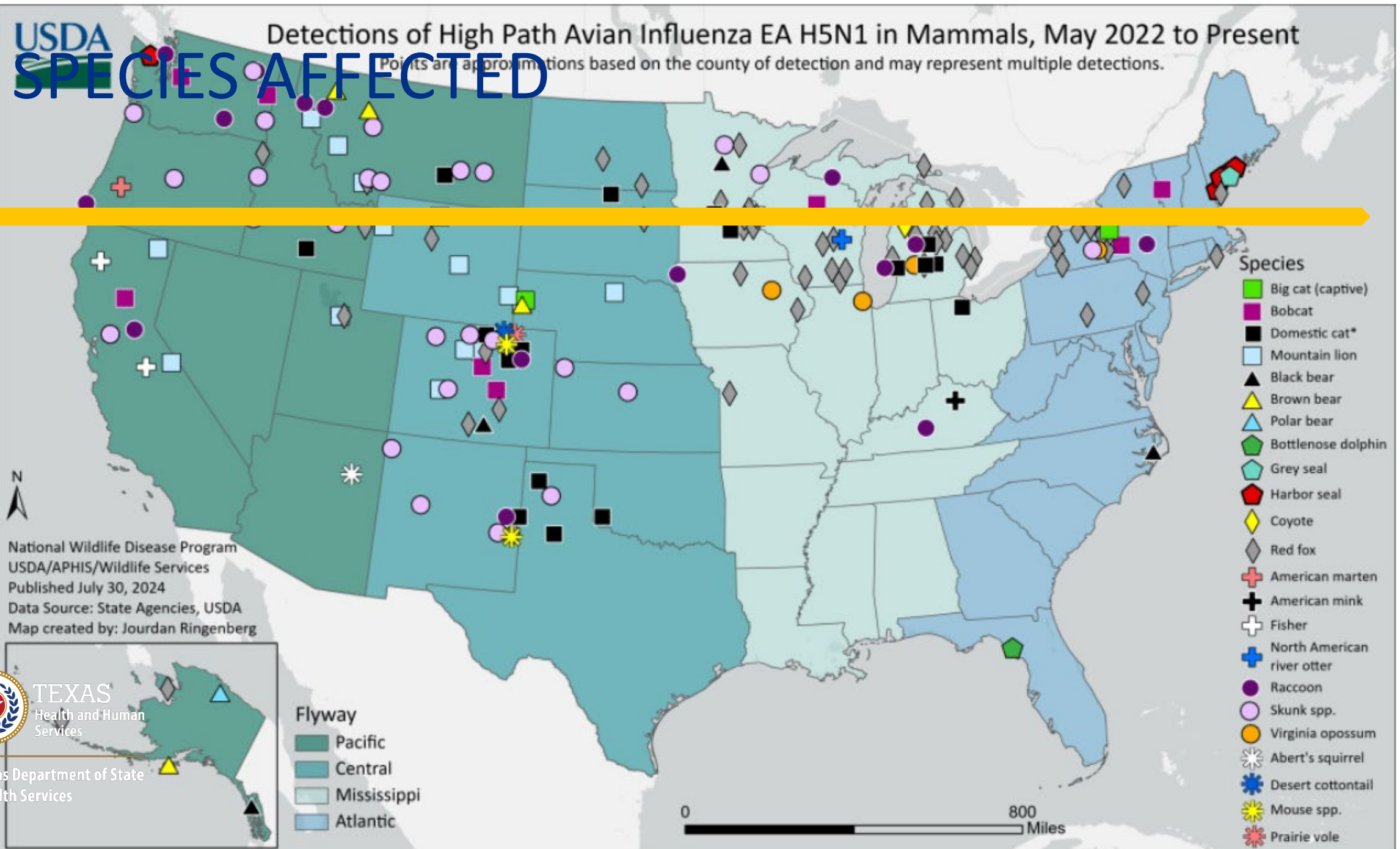
Map of states with affected dairy cattle. USDA. Accessed on July 31st, 2024



Detections of High Path Avian Influenza EA H5N1 in Mammals, May 2022 to Present

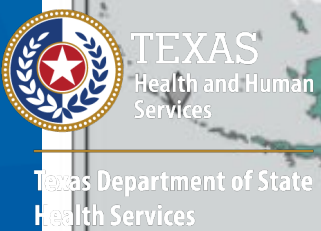
Points are approximations based on the county of detection and may represent multiple detections.

SPECIES AFFECTED



- Species**
- Big cat (captive)
 - Bobcat
 - Domestic cat*
 - Mountain lion
 - Black bear
 - Brown bear
 - Polar bear
 - Bottlenose dolphin
 - Grey seal
 - Harbor seal
 - Coyote
 - Red fox
 - American marten
 - American mink
 - Fisher
 - North American river otter
 - Raccoon
 - Skunk spp.
 - Virginia opossum
 - Abert's squirrel
 - Desert cottontail
 - Mouse spp.
 - Prairie vole

National Wildlife Disease Program
USDA/APHIS/Wildlife Services
Published July 30, 2024
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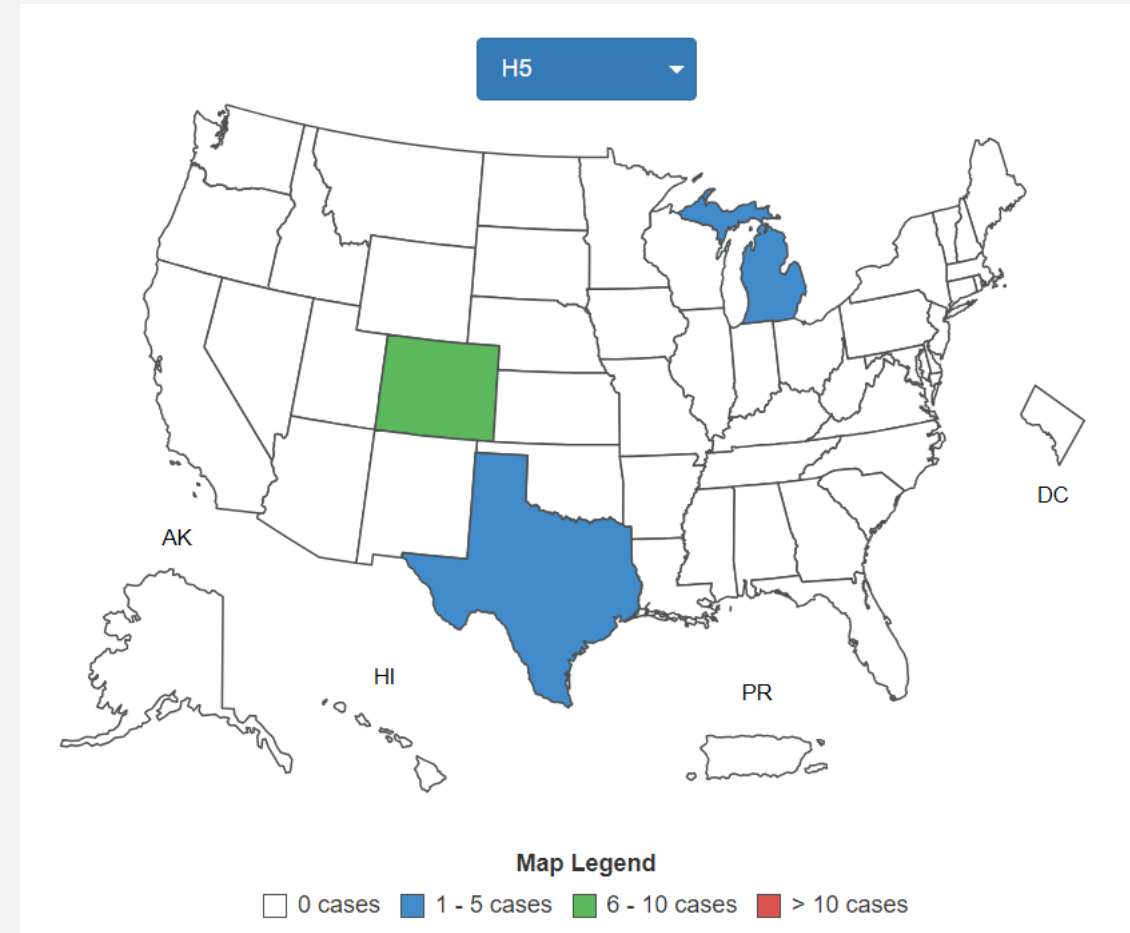


- Flyway**
- Pacific
 - Central
 - Mississippi
 - Atlantic

0 800 Miles

United States Cases

- As of 8/2/24
 - 14 Total reported human cases of H5 in the United States since 2022
 - 4 Human cases of H5 following exposure to dairy cows since April 1, 2024
 - 10 Human cases of H5 following exposure to poultry since April 28, 2022 (9 in 2024)
 - States with Reported Case(s): Colorado, Michigan, Texas



Map of states of positive human infections with H5N1. CDC. Accessed on August 7th, 2024



Lessons Learned

- Importance of fostering relationships
 - Veterinarians
 - Producers

References

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- Texas Department of State Health Services- [2024 Avian Influenza A\(H5N1\) in Dairy Cattle | Texas DSHS](#)
- USDA Animal and Plant Health Inspection Service- [Federal Order Requiring Testing for and Reporting of Highly Pathogenic Avian Influenza \(HPAI\) in Livestock](#)
- United States Department of Agriculture. “ Confirmations of Highly Pathogenic Avian Influenza in Commercial and Backyard Flocks”. Accessed August 1, 2024. [HPAI Detections in Mammals \(usda.gov\)](#)

Thank you!

2024 Avian Influenza A (H5N1): Updates on the Texas Investigation

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