



Highly Pathogenic Avian Influenza H5N1 Genotype B3.13 in Dairy Cattle: National Epidemiologic Brief

OVERVIEW

On March 25, 2024, USDA announced unpasteurized, clinical samples of milk from sick cattle collected from two dairy farms in Kansas and one in Texas, as well as an oropharyngeal swab from another dairy in Texas, tested positive for highly pathogenic avian influenza (HPAI). USDA's National Veterinary Services Laboratories confirmed the detection as HPAI H5N1 clade 2.3.4.4b, genotype B3.13. Phylogenetic analysis and epidemiology support a single introduction into this novel host followed by onward transmission.

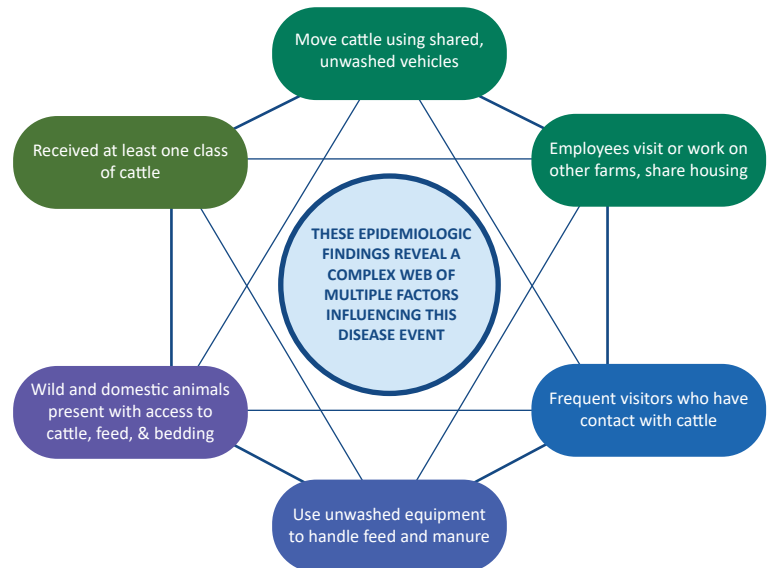
This report provides field epidemiologic summaries using data collected from epidemiologic questionnaires for H5N1 affected dairy herds.

OBJECTIVES

- Better understand the H5N1 emerging health event in dairy cattle
- Explore potential risk factors and transmission routes for infections in dairy cattle
- Identify specific areas for future follow-up

EPIDEMIOLOGIC QUESTIONNAIRES

- Epidemiologic questionnaires were voluntary prior to the Federal Order (effective April 29)
- State-specific questionnaire information is integrated into the USDA questionnaire, where possible
- This epidemiologic summary includes questionnaire data from 64% of affected farms
- Analyses focus on key epi questionnaire data



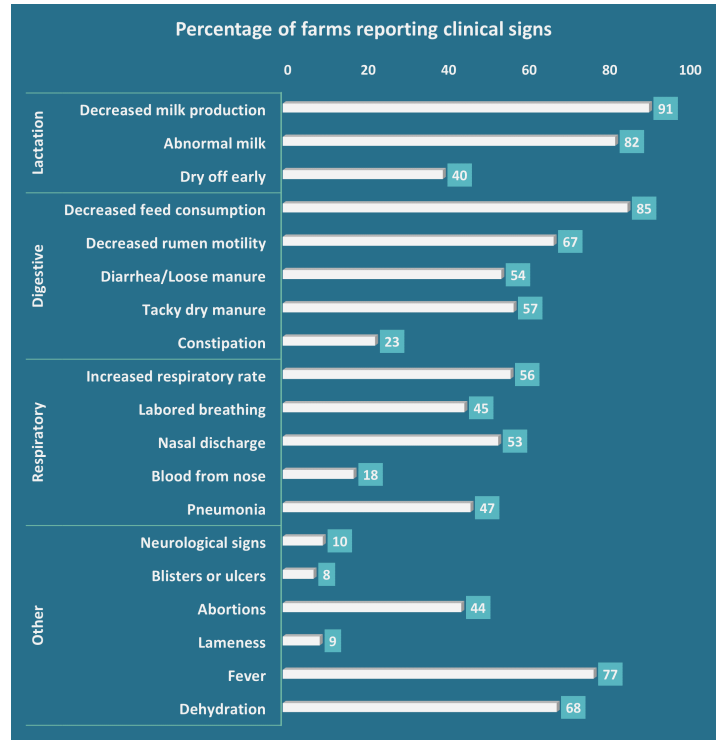
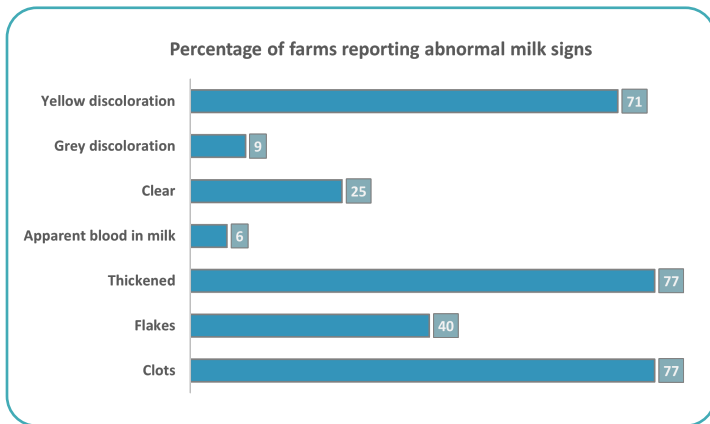
KEY MESSAGES

- The spread of H5N1 between states is linked to cattle movements (versus independent wild bird introduction) with further local spread between dairy farms in some states.
- Disease spread between dairy cattle farms is likely due to many factors, including both direct and indirect transmission routes.
- Biosecurity is key to mitigate the risk of disease spread.

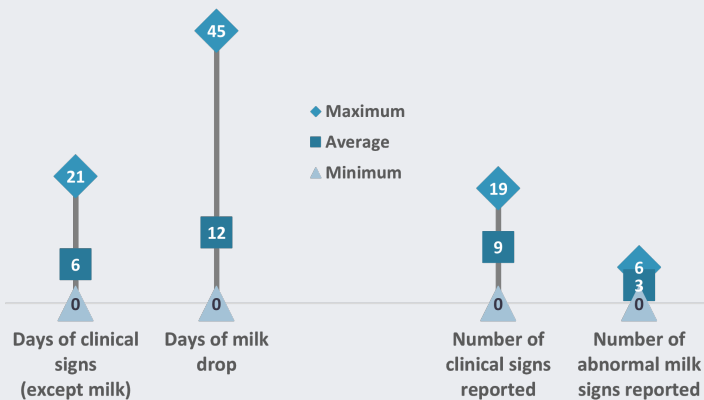
THE CLINICAL PICTURE

CLINICAL OBSERVATIONS

- >80% of farms report abnormal lactation and decreased feed consumption
- >75% of farms reported thickened or clotted milk



MORBIDITY AND MORTALITY OVERVIEW



KEY TAKEAWAYS

- Impact varies significantly between farms.
- Lactating cows are most highly affected.
- Morbidity is <20% on average.
- Mortality is <2% on average.
- Specific reasons for death were not captured.
- This clinical picture is based on data gathered soon after diagnosis or clinical onset, which may underestimate these findings.

Cattle class	Percent of farms reporting animals exhibited clinical signs	Percent of animals that exhibited clinical signs (average)	Percent of ill animals that recovered (average)	Percent of ill animals that died (average)
1st lactation dairy cows	86	11	67	1
2nd lactation dairy cows	93	17	64	4
3rd or high lactation dairy cows	94	21	58	5

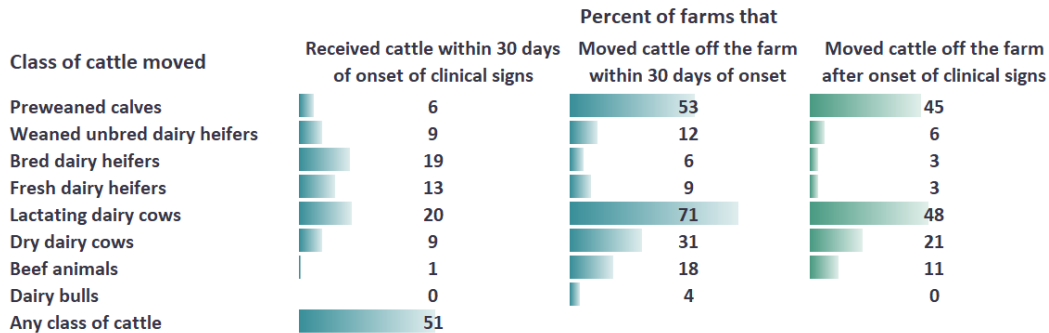
POTENTIAL TRANSMISSION RISKS

ANIMAL MOVEMENT

- >50% of farms received cattle within 30 days of clinical signs
- >45% of farms continue to move animals off the farm after onset of clinical signs
- These movements of calves for rearing and cull cows to market are necessary and allowed by Federal Order

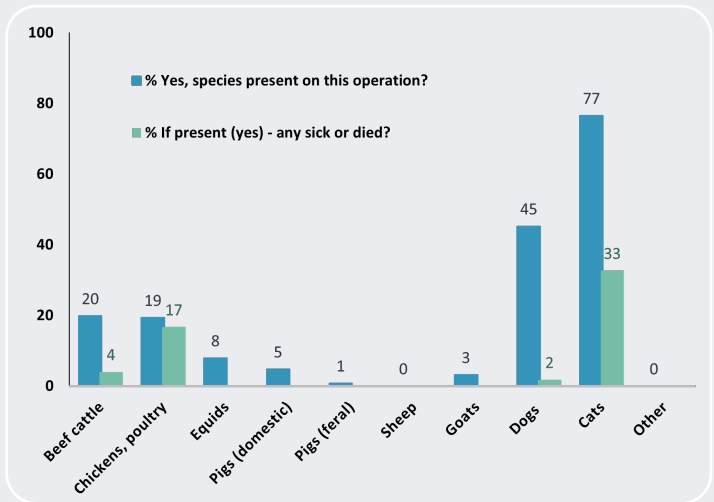
KEY TAKEAWAY

Animal movement is a known and recognized risk for disease transmission.



OTHER SPECIES PRESENT ON DAIRY FARMS

- >75% of farms have cats present
- 33% of farms with cats observed sick or dead cats
- 19% of farms have chickens or poultry present
- 17% of farms with poultry observed sick or dead poultry



KEY TAKEAWAYS

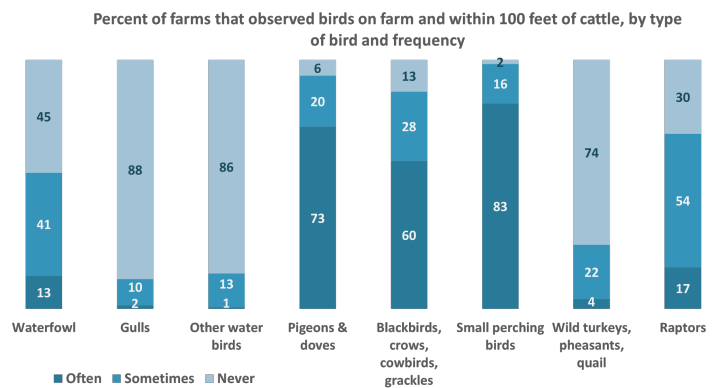
Other species present on a farm can become infected. They can potentially serve as a fomite or indicate disease presence on a farm.

Peridomestic Birds

- All farms observe some type of wild birds near cattle
- 25% of farms observed sick or dead wild birds within 30 days prior to onset of clinical signs

KEY TAKEAWAYS

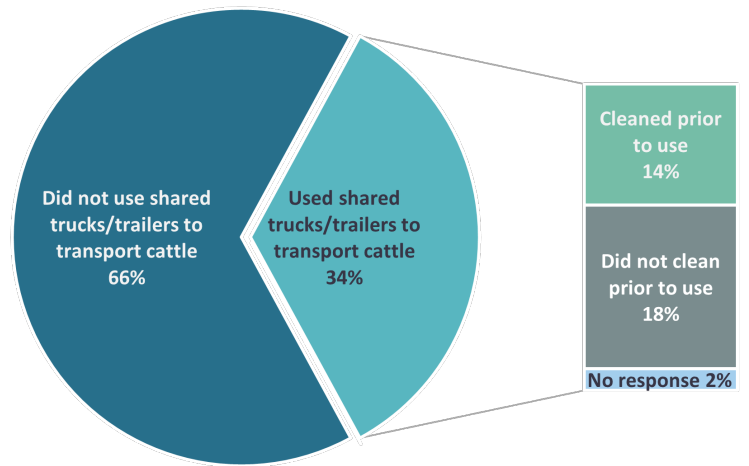
Peridomestic birds can become infected. Currently, there is no genomic or epidemiologic evidence that wild or peridomestic birds are introducing H5N1 to cattle herds.



POTENTIAL TRANSMISSION RISKS

SHARED TRANSPORTATION VEHICLES

- 34% of farms used trucks and trailers that are shared with other farms to transport livestock within 30 days prior to onset of clinical signs
- >50% of farms that used shared vehicles do not clean vehicles prior to use

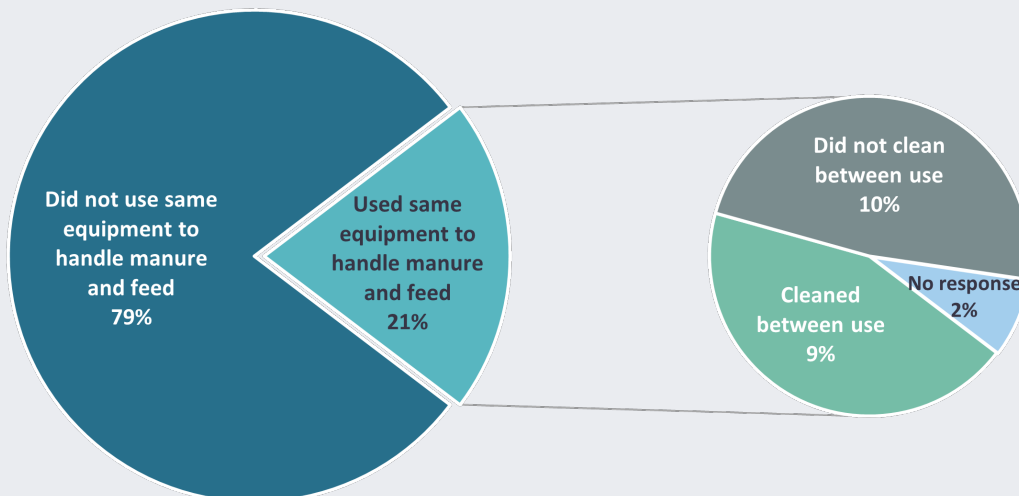


KEY TAKEAWAY

Shared equipment that is not cleaned between farms is a recognized risk for disease transmission.

FEED AND MANURE HANDLING EQUIPMENT

- 21% of farms use the same equipment to handle manure and animal feed
- Nearly 50% of farms that use equipment for both manure and feed do not clean in between use



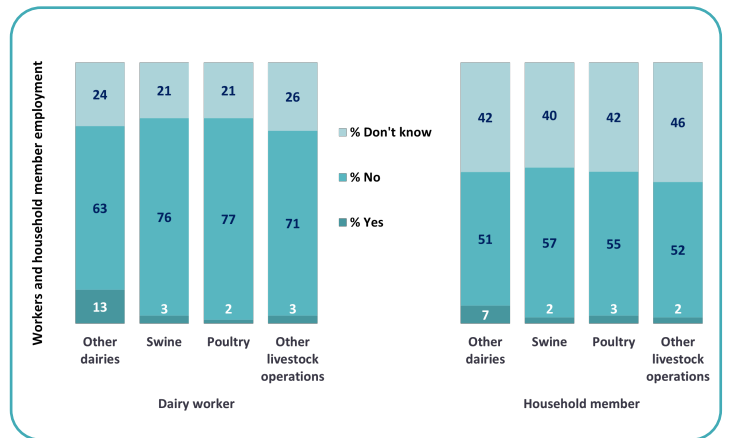
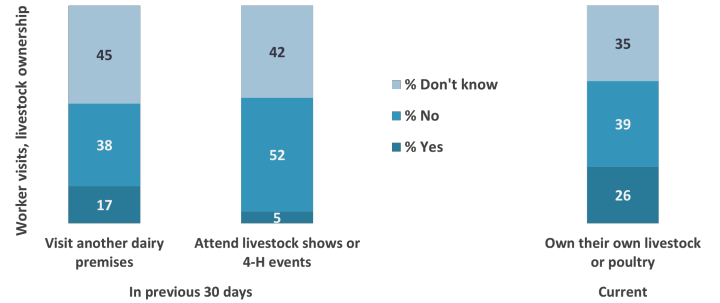
KEY TAKEAWAY

Contaminated equipment is a recognized risk for disease transmission.

POTENTIAL TRANSMISSION RISKS

PEOPLE: SHARED PERSONNEL & HOUSING

- 17% of dairies' employees visited other dairies within 30 days of onset of clinical signs
- >25% of dairies' employees own livestock or poultry at their personal residence
- 21% of dairies' employees work at another farm with livestock
- Most of these employees work on another dairy
- 14% of dairies' employees have household members who work on another farm with livestock



KEY TAKEAWAY

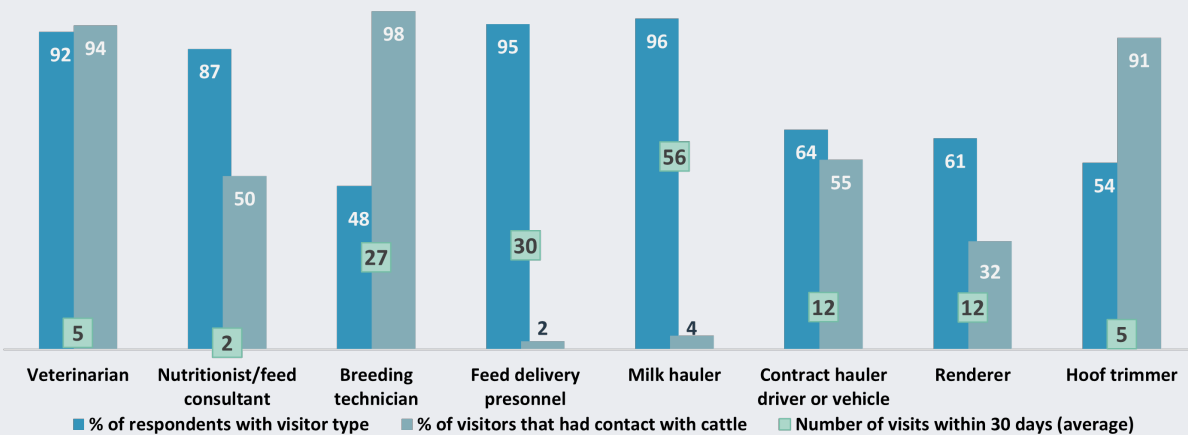
Shared personnel are a recognized risk for disease transmission.

PEOPLE: SUPPORT SERVICES

- Most dairies have regular visitors who have frequent contact with cattle
 - Veterinarians
 - Nutritionists/feed consultants
 - Contract haulers
 - Hoof trimmers
- Many farms use renderers and breeding technicians
 - Frequent visitors
 - Most have contact with cattle

KEY TAKEAWAY

Frequent visitors with access to animals is a recognized risk for disease transmission.



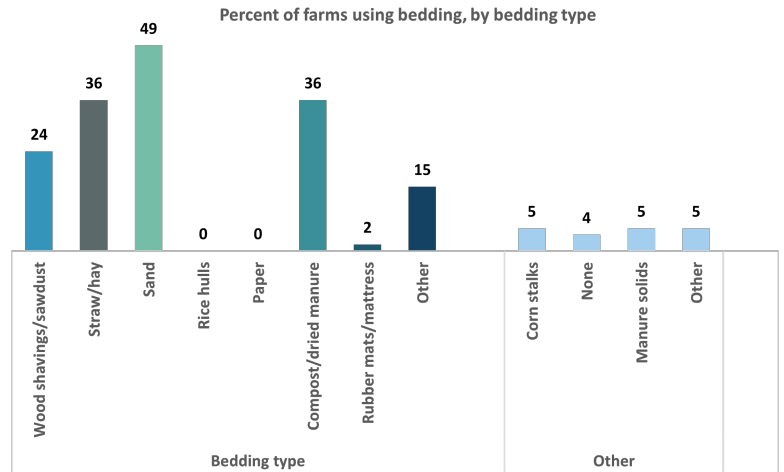
MANAGEMENT PRACTICES

BEDDING TYPE AND STORAGE

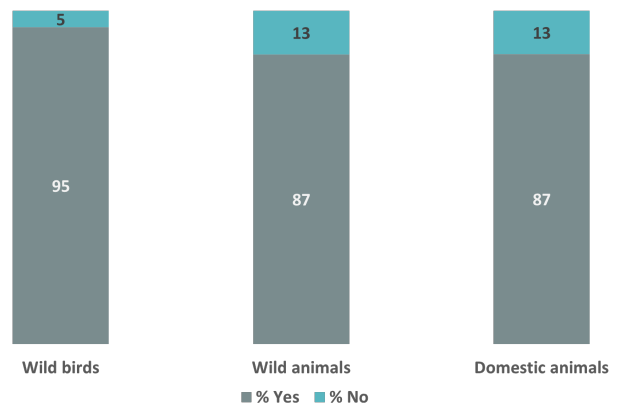
- Sand is the most frequently used bedding
- Straw and composted manure are also commonly used
- Most farms reported that fresh bedding is accessible to wild and domestic animals prior to use

KEY TAKEAWAYS

Bedding can be contaminated by vectors. Storage should **prevent attraction of wildlife** or other potential fomites.



Stored bedding accessible to animals, by animal type



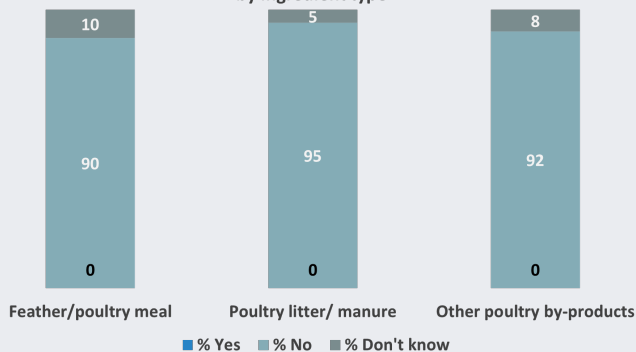
FEED AND FEED STORAGE

- No farms use poultry-based components (feather or poultry meal, poultry litter, other poultry by-products) in their dairy rations
- All farms reported that large birds, small birds, wild animals, and rodents have frequent access to cattle feed or feed ingredients

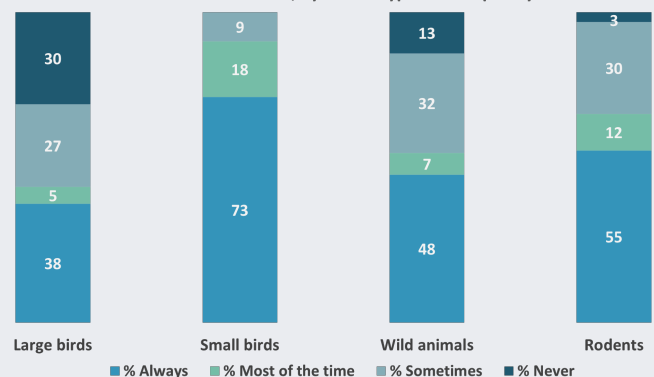
KEY TAKEAWAYS

Control measures to **minimize contamination** of feed and feed ingredients and **avoid attracting wildlife** are key components of a biosecurity plan.

Farms that include poultry-related ingredients in feed, by ingredient type



Feed is accessible to animals, by animal type and frequency of access



MANAGEMENT PRACTICES

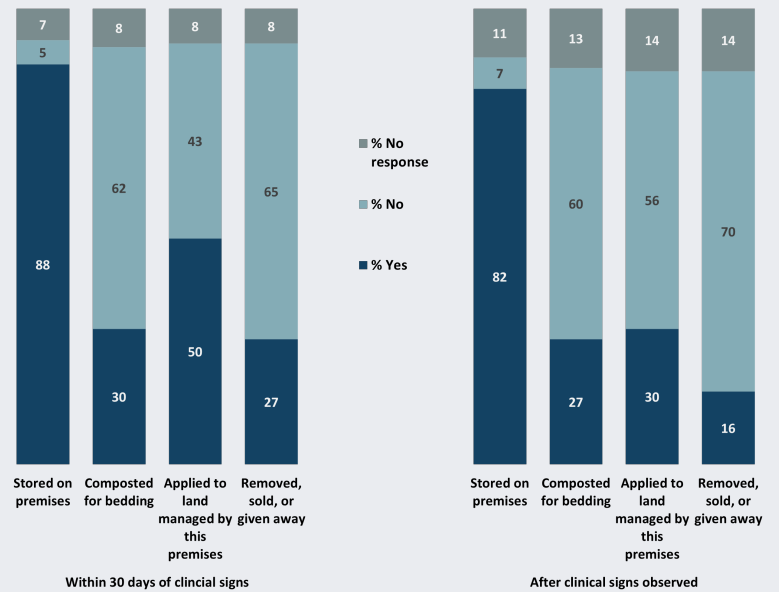
MANURE MANAGEMENT

- >80% of farms store manure on the premises
- Half of farms applied manure to land managed by the premises prior to onset of clinical signs
- The proportion of farms that composted manure, applied to land, or removed/sold/gave away manure decreased after onset of clinical signs

KEY TAKEAWAYS

[Research](#) shows risk from **manure** appears **low** based on individual cow manure samples; following best waste management practices is recommended.

Farm Manure Management Practices



WASTE MILK DISPOSAL

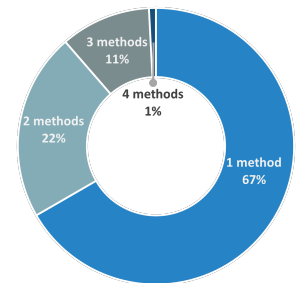
- 64% of farms dispose of waste milk in the lagoon
- Most is not treated prior to disposal
- Some farms feed untreated waste milk to calves, dogs and cats, and swine
- >30% of farms use multiple disposal methods

KEY TAKEAWAY

Proper treatment of raw waste milk prior to feeding to calves or other species is recommended.

The role of waste milk disposal in disease transmission is unknown and needs further study.

Percentage of farms reporting waste milk disposal methods



Percent of farms using disposal and treatment methods

