



NAHMS Sheep 2024 Study Update



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National Animal Health Monitoring
System (NAHMS)

ASI Annual Convention

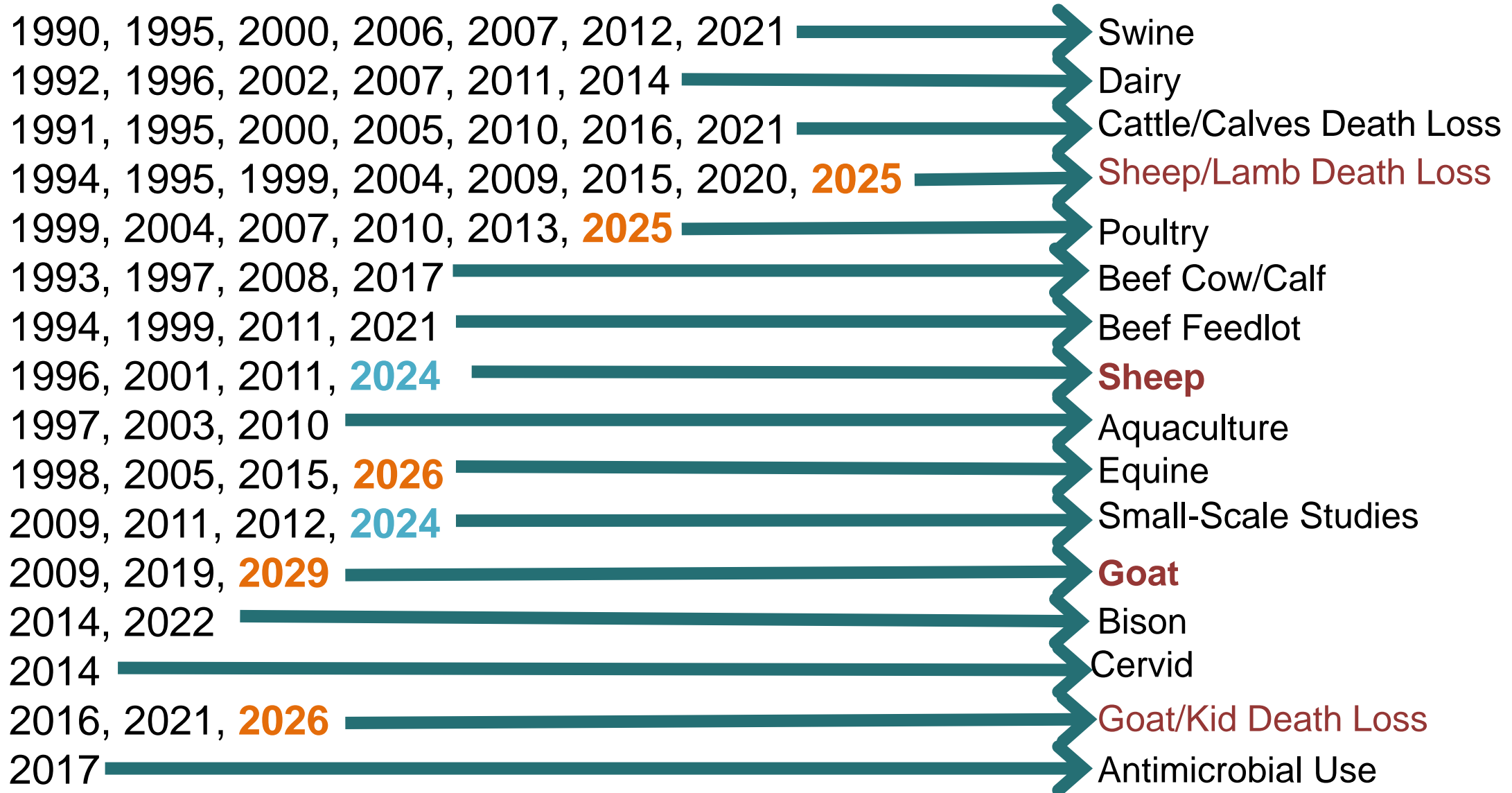
Animal Health Committee

January 16, 2025

What are NAHMS Studies?

- Designed in collaboration with industry
- Voluntary and confidential
- Statistically based to represent the US population
- Collect and analyze animal health data
 - General management
 - Biosecurity
 - Disease prevalence





NAHMS Study Process

Goat 2019

Feedlot 2021

Swine 2021

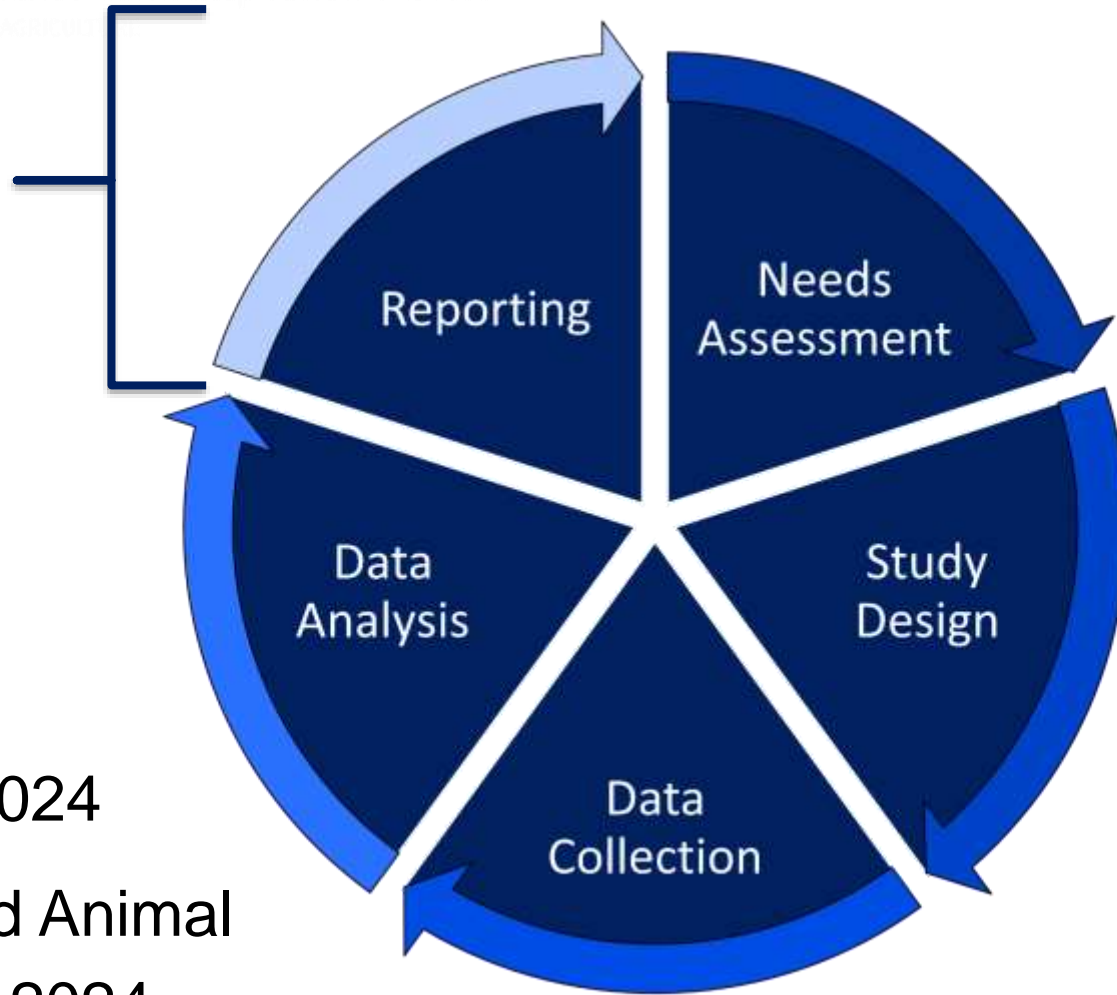
Bison 2022

Sheep 2024

Backyard Animal
Keeping 2024

Poultry Small Enterprise 2025

Equine 2026

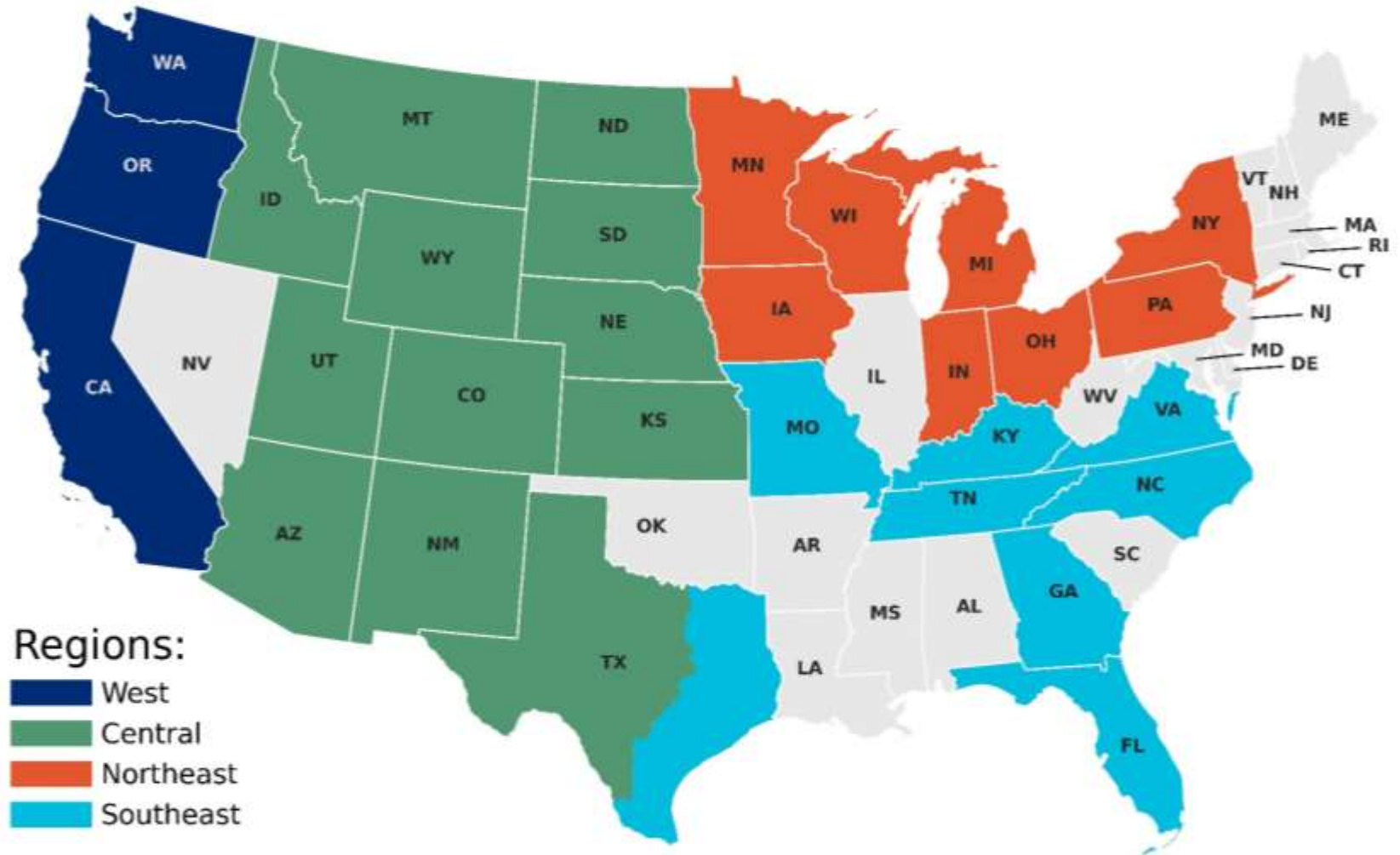


Sheep 2024 States

Divided into 4 regions

Targeted operations with 1 or more ewes for phase I and 20 or more ewes for phase II

States/regions participating in the NAHMS Sheep 2024 study



Study Objectives



Describe management and biosecurity practices associated with, and the producer-reported occurrence of, common economically important sheep diseases.



Describe antimicrobial stewardship on sheep operations and estimate the prevalence of enteric microbes and describe antimicrobial resistance patterns.



Describe management practices producers use to control internal parasites and reduce anthelmintic resistance.

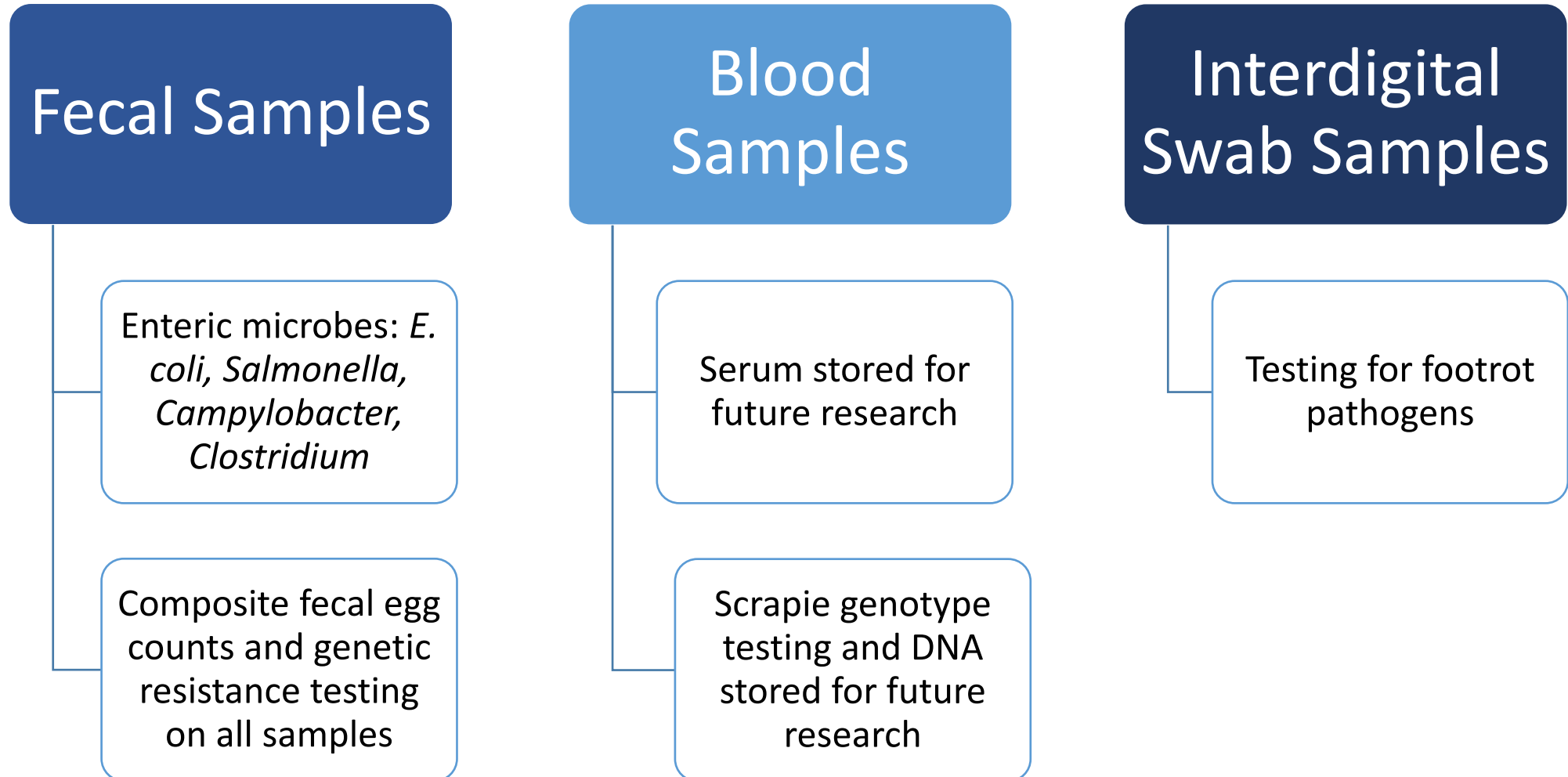


Describe changes in animal health, nutrition, and management practices in the U.S. sheep industry from 1996-2024.



Provide a serologic bank for future research.

Biologic Samples

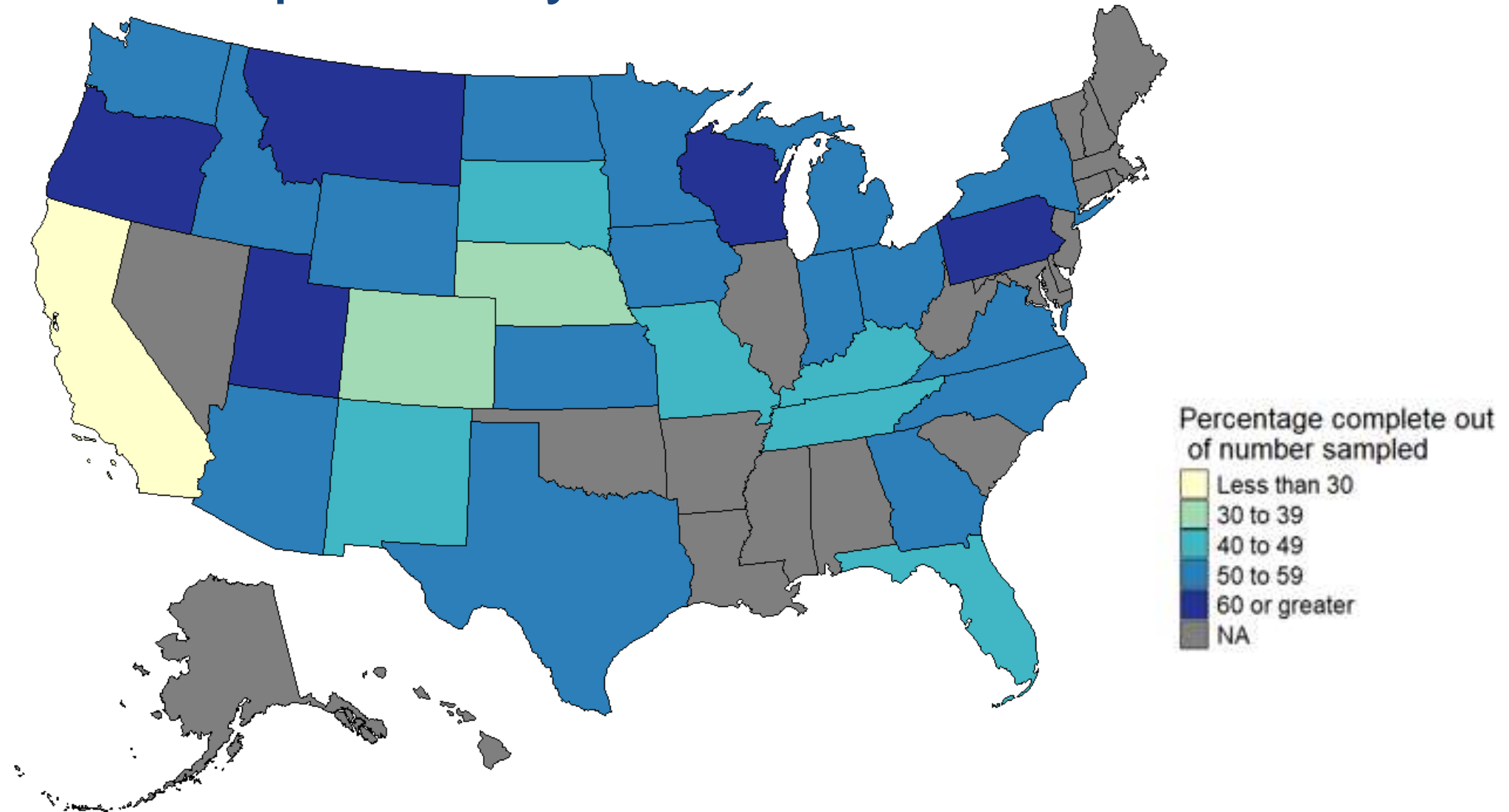


Phase I Crude Response Rate

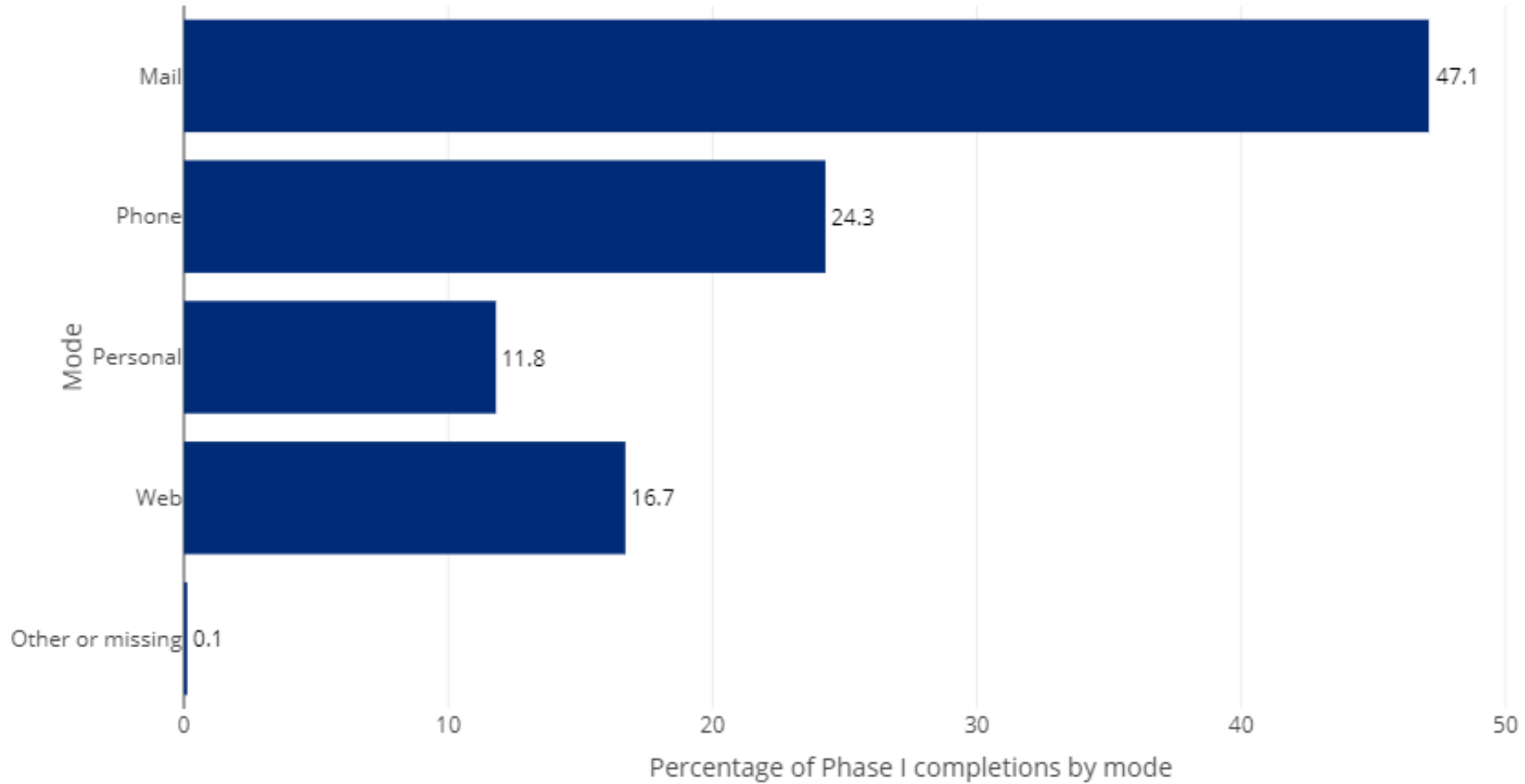
2,461 farms completed = 49.8% Response
4,940 farms selected



Phase I Completion by State



Phase I Completion by Administration Mode



Phase I Response Code Highlights for Incompletes by Study Year

2024

31.1%

7.4%

7.3%



Inaccessible



No sheep



Refusal

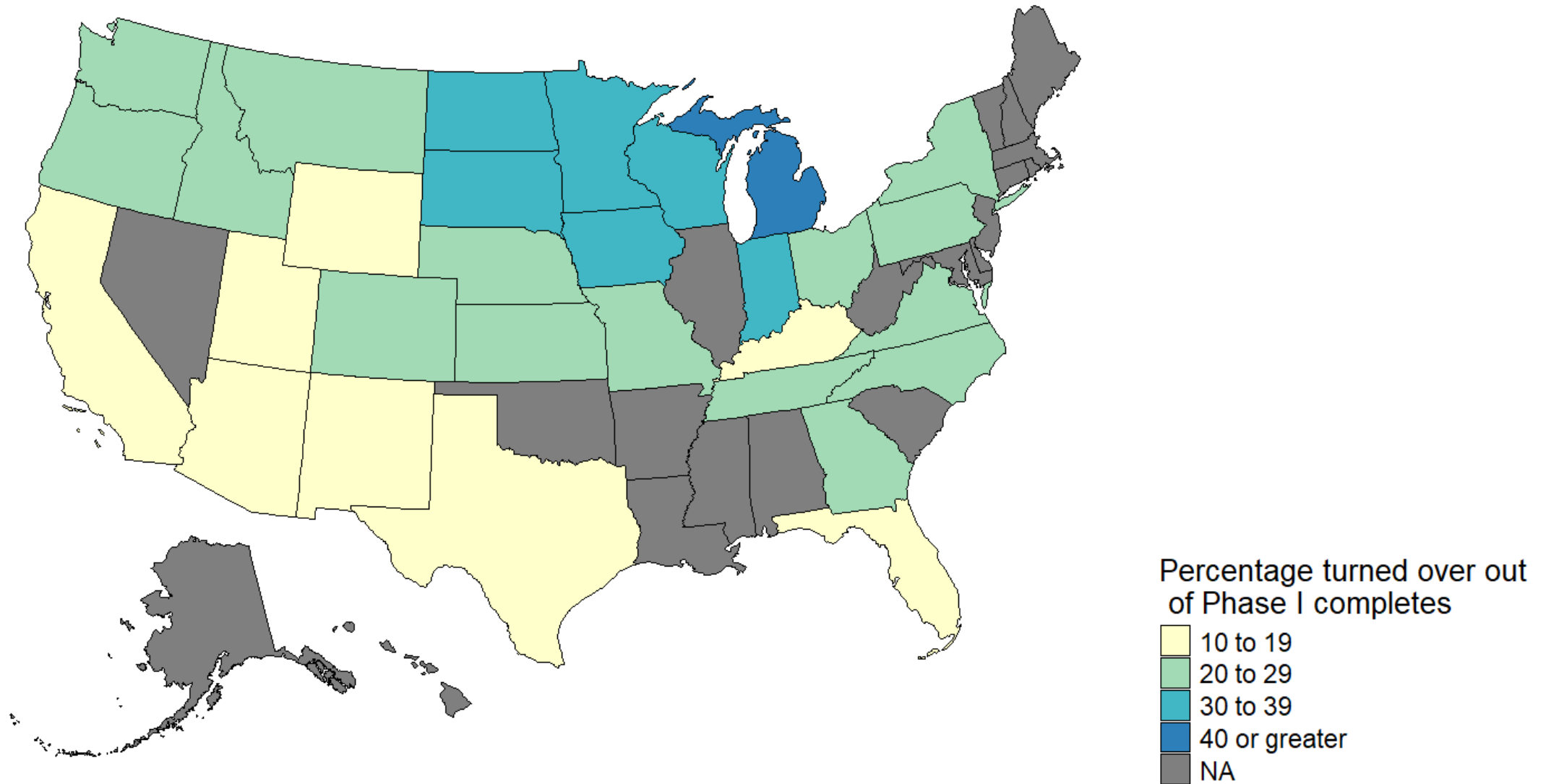
2011

15.4%

4.3%

10.8%

Turnover* for Phase II by State

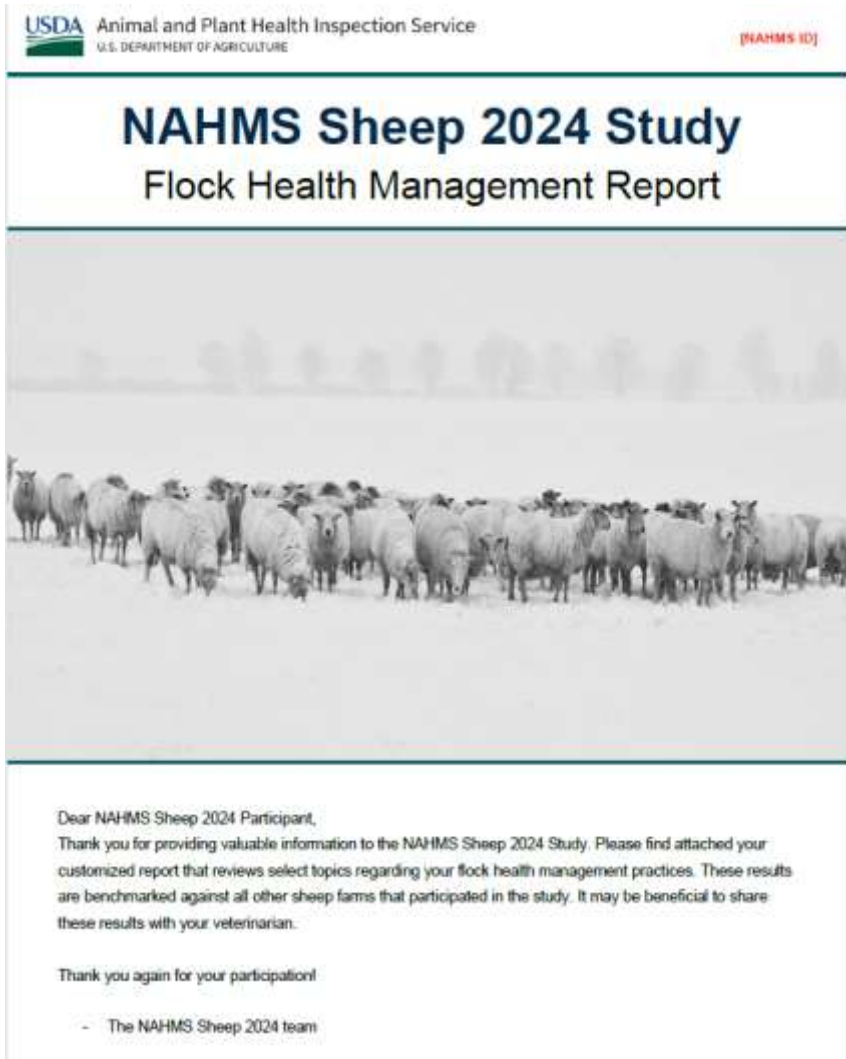


Phase II Current Status

- Phase II is now complete
- Response rates varied widely across State
- Our crude response rate is 62%
- Thank you to all the producers who participated and all the individuals who supported and helped us to achieve such a great response



Customized Flock Health Management Report



Will be sent to every farm that completed the phase I questionnaire

Compares the individual operation to all other operations that participated in the study

Covers a variety of topics, including record keeping, visitor contact, veterinary use, and antibiotic stewardship

Individualized Biologic Reports

Any operation that participates in biologic sampling will receive reports. Reports are sent for:

- Enteric microbes
- Scrapie genotyping
- GI parasites and anthelmintic resistance
- Footrot pathogens*

Date of report: 2024-08-05
ID: 0661

Individual Sheep Scrapie Genetic Resistance Test Results:

Sheep #	Sheep ID	171	136
	401		
	402	QR	AA
	403	QR	AA
	404	QQ	AA
	405	QR	AV
	406	QR	AA
	407	QQ	AA
	408	QR	AA
	409	RR	AA
	410	QR	AA
	411	QQ	AA
	412	QR	AA
	413	QR	AA
	414	QQ	AA
	415	QQ	AA

One or more of the sheep tested on your operation were found to have the alleles less susceptible to classical scrapie. This genotyping information can be used to increase the frequency of the beneficial alleles within the herd. Breeding for resistant classical scrapie transmission.

Date of report: 2024-08-13
ID: 4794

Individual Sheep Enteric Microbe Results:

Sample #	Sheep ID	Salmonella	*STEC E. coli	Campylobacter species	Clostridium
1	22	Negative			
2	3	Negative		Negative	
3	No tag 1	Negative		Negative	C. perfringens
4	39	Negative		Negative	C. perfringens
5	20	Negative		Negative	C. perfringens
6	NT2	Negative		Negative	C. perfringens
7	1104	Negative		Negative	C. perfringens
8	7	Negative		Negative	C. perfringens
9	2693	Negative		Negative	C. perfringens
10	3263	Negative		Negative	C. perfringens
11	3279	Negative		Negative	C. perfringens
12	NT3	Negative		Negative	C. perfringens
13	NT4	Negative		Negative	C. perfringens
14	NT5	Negative		Negative	C. perfringens
15	3014	Negative		Negative	C. perfringens
16	lamb 1	Negative		Negative	C. perfringens
17	lamb 2	Negative		Negative	C. perfringens
18	lamb 3	Negative		Negative	C. perfringens
19	lamb 4	Negative		Negative	C. perfringens
20	lamb 5	Negative		Negative	C. perfringens
21	PW1	Negative		Negative	C. perfringens
22	PW2	Negative		Negative	C. perfringens
23	PW3	Negative		Negative	C. perfringens
24	PW4	Negative		Negative	Negative

*The STEC results are pending. If any sheep test positive for STEC, we will send you a follow-up report with those results. We will not send an additional report if all sheep test negative for STEC.

Interpretation of results: One or more of the sheep tested from your operation were positive for Salmonella, Shiga toxin-producing E. coli (STEC), important Clostridium species, and/or Campylobacter in their feces on the day sampled. You may want to share these results with your veterinarian.

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FOR MORE INFORMATION
USDA-APHIS-VS-CEAH

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Fort Collins, CO 80526-8117
866.907.8190 | NAHMS@usda.gov
https://www.aphis.usda.gov/naahms



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FOR MORE INFORMATION
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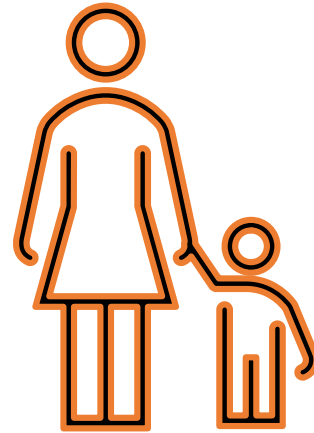
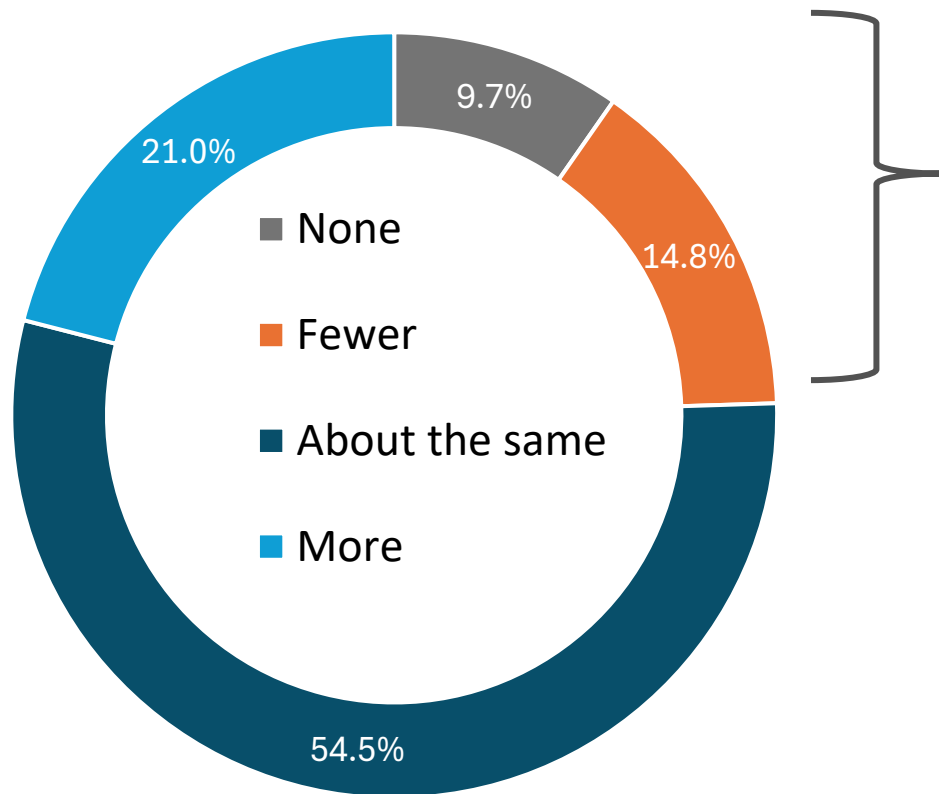
NRRC Bldg. B, M.S. 2E7 | 2150 Centre Ave.
Fort Collins, CO 80526-8117
866.907.8190 | NAHMS@usda.gov



* In States where footrot pathogen reporting was approved by the State veterinarian.

Sneak Peak- Phase I **Preliminary*** Highlights

Inventory Expectations in the Next 5 Years



62.9%

Reported retirement, lack of a successor, or another personal or family situation for having fewer or no sheep in the next five years.

* This is all unweighted data and data are still undergoing cleaning and validation. These results will be different in the final reports.

Sneak Peak- Phase I **Preliminary*** Highlights

Permanent Additions and Removals in 2023



36% of
operations added
sheep



77% of
operations
removed sheep

* This is all unweighted data and data are still undergoing cleaning and validation. It is likely these results will change in the final reports.

Sneak Peak- Phase I **Preliminary*** Highlights

Direct Sales to Consumers or Ethnic Markets in 2023



26% of operations

% of operations with direct sales of:

Lambs: 23%

Culls: 10%

Breeding or other: 15%

Average number of sheep sold/operation

Lambs: 127

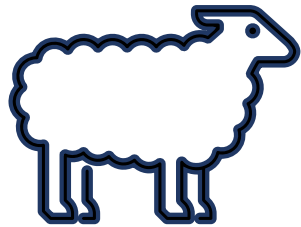
Culls: 34

Breeding or other: 67

* This is all unweighted data and data are still undergoing cleaning and validation. It is likely these results will change in the final reports.

Sneak Peak- Phase I **Preliminary*** Highlights

Primary System for Maintaining Sheep Production Records



5.6%

Livestock or sheep
management
software



13.0%

Other
electronic
record-keeping



58.9%

Handwritten
notes



1.8%

Any other
method



20.7%

Did not
maintain
records

Common records maintained included: Number of lambs born (78.9%), date of lambing (74.9%), number of animals that died (66.3%), number of animals culled (62.1%), and preventive practices (61.9%)

* This is all unweighted data and data are still undergoing cleaning and validation. It is likely these results will change in the final reports.

Sneak Peak- Phase I **Preliminary*** Highlights

Veterinary Use



43%

of operations had consulted a veterinarian for any reason related to sheep health, productivity, or management during 2023

**Primary Reason for
NOT Consulting a Vet:**

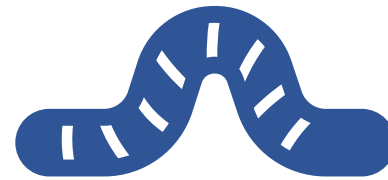
72% No vet needed

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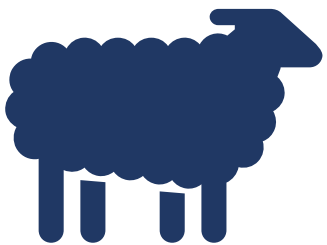
Sneak Peak- **Preliminary*** GI Parasite Results



353
operations
submitted samples



618
eggs/gram is the
average fecal egg
count on these farms



6,000
sheep were
sampled



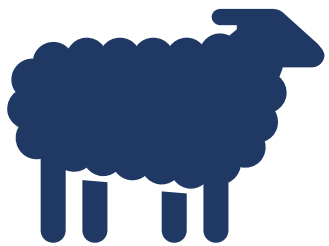
30
operations were
positive for liver flukes

* This is all unweighted data and data are still undergoing cleaning and validation. These results will change in the final reports.

Sneak Peak- **Preliminary*** Scrapie Genotyping Results



333
operations
submitted samples



4,305
sheep were
sampled

QR

38.8%

of sheep tested were
QR at codon 171

RR

40.7%

of sheep tested were
RR at codon 171

* This is all unweighted data and data are still undergoing cleaning and validation. It is likely these results will change in the final reports.

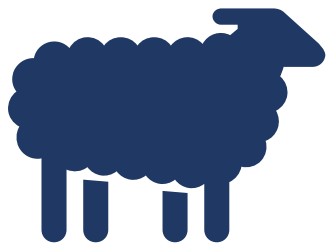
Sneak Peak- **Preliminary*** *Campylobacter* Results



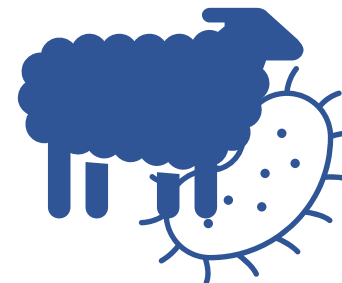
209
operations have
submitted samples



56%
of operations had at least
one sample positive for
Campylobacter



4,153
sheep have
been sampled



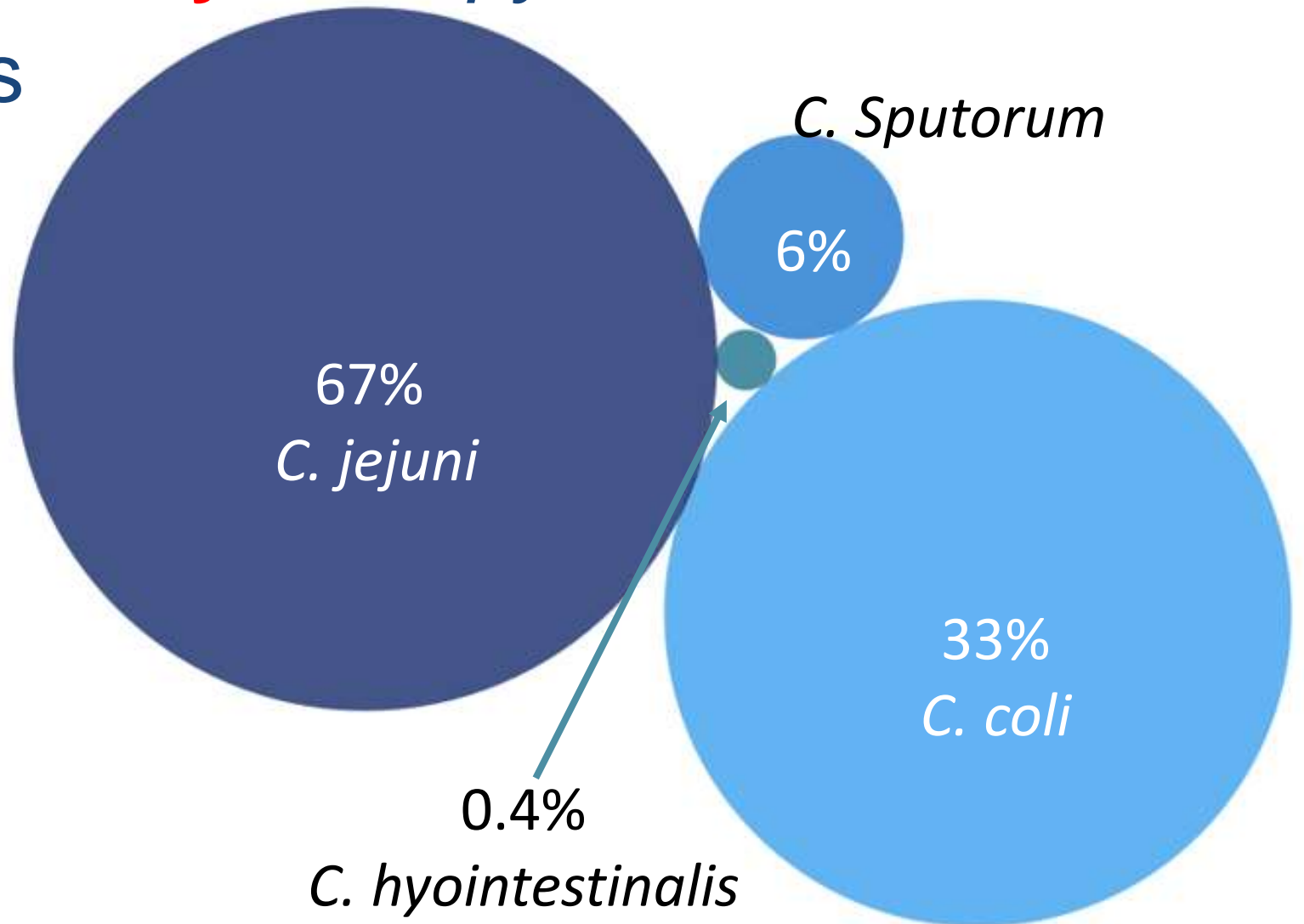
13%
of sampled sheep were
positive for *Campylobacter*

* This is all unweighted data and data are still undergoing cleaning and validation. It is likely these results will change in the final reports.

Sneak Peak- **Preliminary*** *Campylobacter*

Isolation by Species

* This is all unweighted data and data are still undergoing cleaning and validation. It is likely these results will change in the final reports.



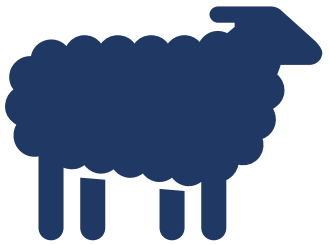
Sneak Peak- **Preliminary*** *Salmonella* Results



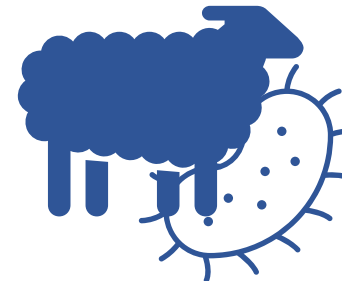
184
operations have
submitted samples



8%
of operations had at least
one sample positive for
Salmonella



3,738
sheep have
been sampled



0.6%
of sampled sheep were
positive for *Salmonella*

* This is all unweighted data and data are still undergoing cleaning and validation. It is likely these results will change in the final reports.

Next Steps for Sheep 2024

Phase I Reporting

- Send out Customized Flock Health Management Reports
- Write reports (**Part I: Reference of Sheep Management Practices in the United States, 2024**)
- Write infobriefs and producer-oriented documents

Phase II Validation

- Clean and validate phase II data
- Write reports (Part II and Part III)
- Write infobriefs and producer-oriented documents

Complete additional testing

- Clean and analyze lab results
- Write manuscripts with collaborating labs

Where to find results?

Scrapie and Genotyping in Goats

Information Brief January 2022

INTRODUCTION
Scrapie is a fatal, degenerative disease of sheep and goats that mainly affects the animals' brain and spinal cord. Scrapie belongs to a group of diseases called transmissible spongiform encephalopathies (TSEs). TSEs are caused by an infectious agent known as a prion. Unlike bacteria and viruses, prions are a misfolding of normal proteins found on the body and an infectious when passed to a person or animal. Scrapie conventionally impacts sheep and goat industries through production losses, lost exports, and decreased production and disposal costs. In the United States, the economic impact of scrapie is estimated at \$10 to \$20 million per year. Therefore, eliminating scrapie in the United States is beneficial for the sheep and goat industries. Scrapie genotype testing is one mechanism to help breed goats that are less susceptible to scrapie.

NAHMS GOAT 2019 STUDY
U.S. Department of Agriculture's National Animal Health Monitoring System (NAHMS), in collaboration with the National Agricultural Statistics Service, conducted an annual national study of the U.S. goat industry in 2019. The NAHMS Goat 2019 study gathered information on goat health and management practices on U.S. goat operations through two phases and biologic sampling. The study was conducted on 34 of the nation's major goat-producing states, or selected operations with 3 or more adult goats (Figure 1).

Goat producers who completed the study's phase 1 and 2 questionnaires were eligible to participate in biologic sampling. Whole blood samples were collected from up to 15 goats, aged 18 months or more, on operations that allowed to participate in the scrapie genotype testing. All blood samples were collected by federal veterinarians or animal health technicians and sent to the National Veterinary Services Laboratory for genetic testing. Farms with more than one herd of goat were eligible to have an additional 5 samples taken from unrelated bucks or does of the other breed(s). Goats were considered unrelated if they did not share a sire or dam. The goals for scrapie susceptibility genotyping were to determine the prevalence of resistant genotypes in U.S. goats and assess variation in prevalence among goat breeds, gender, region (West, East), and goat production types (dairy, meat, other).

Figure 1. States/Regions that participated in the 2019 NAHMS Goat 2019 Study



*Texas and Oklahoma were included as a few corresponding to north-west American (1). The western portion of the States were included in the West region, and the eastern portion were included in the East region.
- Animal and Plant Health Inspection Service -

Use of Veterinarians on Goat Operations

NAHMS Goat Study 2019 August 2020

A HIGHER PERCENTAGE OF GOAT PRODUCERS ARE CONSULTING VETERINARIANS



A higher percentage of producers on large operations (59.5%) than on small operations (45%) consulted a veterinarian. A higher percentage of dairy producers (81.8%) than meat or other producers (47.1% and 46.8% respectively) consulted a veterinarian.

PRODUCER-VETERINARIAN RELATIONSHIPS ARE EVOLVING



REASONS FOR CONSULTING A VETERINARIAN



USDA
United States Department of Agriculture
Animal and Plant Health Inspection Service
Veterinary Services

Goat 2019

Reference of Agritourism Practices on Goat Operations in the United States, 2019

National Animal Health Monitoring System
September 2022


Sheep and Goat Death Loss Studies


Sheep Death Loss

- **Ongoing– Please Participate!**
- Part of the NASS January Sheep and Goat Report
- Provides valuable information on death loss due to predators and disease
- Allows for trend analysis

SHEEP AND GOAT REPORT – JANUARY 1, 2025

OMB No. 0535-0213
Approval Expires: 9/31/2027
Project Code: 155
Survey ID: 1849
Version A: AL, AR, CT, DE, FL, GA, IL,
IN, IA, KS, KY, LA, MA, ME, MD, MI,
MN, MO, MS, NE, NH, NJ, NY, NC, ND,
OK, PA, RI, SC, TN, VA, VT, WV, WI

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Department of
Agriculture**

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Fax: 1-855-415-3587
E-mail: nass@usda.gov

Please make corrections to name, address, and ZIP Code, if necessary.

The information you provide will be used for statistical purposes only. Your response will be kept confidential and any person who willfully discloses ANY identifiable information about you or your operation is subject to a jail term, a fine, or both. This survey is conducted in accordance with the Confidential Information Protection and Statistical Efficiency Act of 2016, Title III of Pub. L. No. 115-435, codified in 44 U.S.C. Ch. 35 and other applicable Federal laws. For more information on how we protect your information please visit: <https://www.nass.usda.gov/confidentiality>. Response is voluntary.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB number is 0535-0213. The time required to complete this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Office Use Only	FIPS	POID	Traof.	Subtr.

1. Please verify name and mailing address of this operation.
Make corrections (INCLUDE the correct operation name) on the label and continue.
2. Were any sheep, lambs, goats or kids, regardless of ownership; INCLUDE Barbados and all hair breed sheep.
 - on this operation on January 1, 2025?
 - on this operation at any time during 2024?
 - or will there be any on this operation at any time during 2025?

Yes - Go to Item 3 No - Go to Item 2a
- a. Were you (the individual named on the label) operating a farm or ranch on January 1, 2025?
 - Yes - Go to Section 4 No - Go to Section 3



Percentage of nonpredator losses of adult and kid goats, by nonpredator cause, animal class, and year

Nonpredator Losses	Adult goats	Preweaned kids	Postweaned kids
Internal parasites	24.8% 19.7%	15.6% 13.0%	37.7% 21.8%
Enterotoxemia	1.2% 1.5%	1.0% 2.3%	2.4% 2.4%
Other digestive problems	4.7% 6.7%	5.3% 6.7%	5.7% 7.0%
Respiratory problems	3.4% 5.4%	5.6% 8.3%	5.3% 11.1%
Metabolic problems	0.6% 1.0%	1.3% 0.6%	0.3% 0.8%
Pregnancy toxemia	1.6% 2.5%	NA NA	NA NA
Footrot	NA 0.9%	NA 0.0%	NA 0.0%
Other disease problems	2.5% 2.0%	1.9% 1.4%	2.8% 1.0%
Lameness	NA 1.7%	NA 2.0%	NA 1.4%
Kidding problems	5.2% 4.1%	10.7% 10.7%	NA NA
Starvation	1.1% 0.0%	1.7% 1.8%	0.2% 0.3%
Poisoning	1.6% 1.0%	1.1% 1.3%	2.2% 0.8%
Weather-related causes	4.0% 3.0%	19.0% 9.5%	6.5% 3.3%
Fire	NA 0.1%	NA 0.0%	NA 0.1%

Future Goat Studies

Next study year: 2029?
Needs Assessment: 2027
Industry Support: Starts now



Acknowledgments

- US Sheep Producers
- American Sheep Industry
- American Association of Small Ruminant Practitioners
- American Association of Extension Veterinarians
- California Department of Food and Agriculture, AUS
- Colorado State University
- Iowa State University
- Louisiana State University
- National Veterinary Services Laboratory
- North Carolina State University
- UC Davis Veterinary Medicine Extension
- USDA Agriculture Research Service, Ames IA

NAHMS Team

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- Chuck Fossler
- Alice Green
- Charles Haley
- Stephanie Kolar
- Katherine Marshall
- Meg Parker
- Diana Short
- Natalie Urie
- Matthew Vuolo
- Alyson Wiedenheft
- Abby Zehr
- Brennan Danek
- Christine Foxx



Thank you!

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