



# **National Scrapie Eradication Program**

## **Fiscal Year 2023 Report**

*October 1, 2022 to September 30, 2023*

U.S. Department of Agriculture  
Animal and Plant Health Inspection Service  
Veterinary Services

Strategy and Policy Unit  
Sheep and Goat Health Center

Prepared March 15, 2024



## ***A Note on Navigation***

This presentation has hyperlinks for navigation. Text in **blue** is a hyperlink to the slide or website being discussed. Additionally, there are action buttons on each page:



*Return to the last slide viewed*



*Return to 1<sup>st</sup> page of the Introduction*

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- The links have greater reliability if only 1 monitor is in use
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## ***Introduction***

***The National Scrapie Eradication Program focuses on seven primary areas:***

- Education and prevention
- Animal identification and compliance
- Surveillance [Regulatory Scrapie Slaughter Surveillance (RSSS) and on-farm]
- Tracing positive and exposed animals and testing exposed animals
- Cleanup of infected and source flocks through genetic susceptibility testing and indemnification of susceptible exposed animals
- Monitoring previously infected and exposed flocks
- The Scrapie Free Flock Certification Program (SFCP)

## *Program Summary*

***Positive Animals*** – No classical scrapie was confirmed in goats or sheep in FY 2023. Nor98-like scrapie was confirmed in 1 sheep sampled in June 2023. The most recent case that tested positive for classical scrapie was in one sheep sampled at slaughter in January of FY 2021. This sheep had resided in a flock in Wisconsin, and VS attributed the flock of origin to Arkansas; it was not completely traceable due to lack of identification to flock of origin.

***States that have been free of classical scrapie cases for >7 Fiscal Years*** ([Figure 1](#))

Sheep: 48 states

Goats: 48 states

***Infected and Source Flocks*** - The number of newly designated infected and source flocks by fiscal year since FY 1997 is shown in [Chart 1](#). The peak was in FY 2005 with 179 flocks.

## *Program Summary*

***Scrapie in Goats*** –The total number of NVSL confirmed positive cases in goats is 44 since FY 2002. Samples from three of these positive animals were collected through RSSS, one in November 2014, the second in July 2018, and the most recent in June 2019. The remainder of the positive cases have been found through testing of clinical suspects, testing of exposed animals, and trace-out investigations.

***Scrapie Free Flock Certification Program (SFCP)*** – At the end of the FY 2023, there were 173 flocks participating in the Scrapie Free Flock Certification Program (SFCP). Statuses of these flocks were 26 export monitored, 34 export certified, and 113 select monitored flocks ([Figure 2](#)). SFCP open statuses by fiscal year of Status date from FY 2007 to FY 2023 are depicted in [Chart 2](#).

# Surveillance

Surveillance activities are reported by Field Operations Districts shown in [Figure 3](#). Surveillance minimums are based on estimated breeding sheep and goat populations in each State, and the distribution of sheep and goat populations by District is shown in [Chart 3](#).

## Components of Scrapie Surveillance

- **Regulatory Scrapie Slaughter Surveillance (RSSS)** started April 1, 2003. It is a targeted slaughter surveillance program which is designed to identify infected flocks. As of the end of FY 2023, samples have been collected from 745,540 animals since April 1, 2003. 25,372 samples were collected in FY 2023, 16,646 from sheep and 8,726 from goats.\* There have been 491 NVSL confirmed positive animals (474 classical cases – 471 sheep and 3 goats) and 19 Nor98-like cases since the beginning of RSSS. [Figure 3](#) depicts RSSS collection sites in FY 2023.

*\*Total sampling is decreased primarily due to the negative impacts of HPAI on the ability to collect samples.*

# Surveillance

## Components of Scrapie Surveillance

- **RSSS Genotyping** started in November 2018 as a pilot project to decrease the costs of scrapie IHC testing in a subset of submission by only testing those animals that are genetically susceptible to scrapie. DNA is first analyzed to determine the genotype at codon 171, and tissue samples are only IHC tested if the sheep is genetically susceptible, not if it is genetically resistant/less susceptible (QR, RR, RK, or RH). The number of genotyped sheep is included in the total number of sheep tested through RSSS. To date, no samples from genetically susceptible sheep referred for scrapie testing have tested positive. The project was deemed in May 2021 to result in cost savings and RSSS genotyping will be continued indefinitely at the currently participating sites.
  - In FY 2019 – FY 2022, a total of 10,703 sheep were genotyped; 7,640 (71.4%) of these were not genetically susceptible.
  - In FY 2023, 2,406 sheep were genotyped; 1,759 (73.1%) of these were not genetically susceptible.

The number of sheep and goats collected in each District for RSSS is shown in [Chart 4](#). [Figure 4](#) is a hex map, representing the number of animals collected in each State. [Chart 5](#) compares RSSS sampling by month for the current year with the monthly average of the previous 6 years.

# Surveillance

## Components of Scrapie Surveillance (continued)

- **On-farm Surveillance** includes both regulatory testing of scrapie exposed and potentially exposed sheep and goats and testing sheep and goats on farm for routine surveillance. 743 sheep and 636 goats were tested on-farm in FY 2023. No animals tested positive.

## Surveillance Goals

The annual target is to test at least 40,000 animals for scrapie. Negative impacts of HPAI reduced the ability to collect samples and contributed to not meeting this target. 26,751 animals were sampled for scrapie testing in FY 2023:

- 25,372 RSSS samples and 1,379 on-farm samples
- Of which 17,389 were sheep and 9,362 were goats.

Progress towards meeting the national surveillance target is depicted in [Chart 6](#). Distribution of sampling by type (RSSS or on-farm) and by species is shown in [Chart 7](#). [Chart 8](#) and [Table 1](#) is a breakdown by face-color (sheep) and type (goats) by age. [Chart 9](#) shows samples collected at slaughter by fiscal year by species and face-color (sheep).



# Surveillance

## State Sampling Minimums

The National Scrapie Eradication Program establishes annual sheep and goat sampling minimums for each State and tracks the States' level of compliance with meeting these minimums. These State minimums were implemented in FY 2010 to ensure adequate geographical representation, so that APHIS can find the last remaining cases and document freedom from scrapie. State sampling minimums are established based on the population demographics of mature sheep and goats in each State. The calculations used to derive the sampling minimums are described in the [National Scrapie Surveillance Plan](#). The total number of animals sampled by State of Animal ID, are listed in in the following slides:

|                   |                         |                   |                         |
|-------------------|-------------------------|-------------------|-------------------------|
| <b>District 1</b> | <a href="#">Table 2</a> | <b>District 3</b> | <a href="#">Table 4</a> |
| <b>District 2</b> | <a href="#">Table 3</a> | <b>District 4</b> | <a href="#">Table 5</a> |

The percent sampling minimum for sheep and goats achieved by each State in FY 2023 are depicted in [Figure 5](#) and [Figure 6](#).

## *Surveillance*

### *Surveillance option for meeting state minimums*

Historically, several States have had difficulty meeting their annual sampling requirement. Starting in FY 2018, these States were able to increase and, in most cases, meet the sampling minimum by identifying sheep producers or dealers for genotyping of codon 171 prior to live-animal testing (rectal biopsy) of the genetically susceptible (primarily QQ, also KK, QH, QK) animals. Genotyping is done to reduce the costs associated with live-animal testing. The susceptible sheep that were live-animal tested and the genetically less susceptible (QR, RK, or RH) and genetically resistant (RR) sheep were credited to the State. None of the susceptible animals that were live-animal tested were positive.

Sheep sampled on producer premises that had tags originating in a different State were credited to both the State of origin and the State where sampling occurred; if sampling occurred on a dealer premises they were credited only to the State of origin. These additional samples are included in the Total Number of Sheep Sampled column of Districts Tables (Tables 2 through 5), and in the calculations for the hex maps showing the percent of sampling minimum achieved (Figures 5 and 6). These genotyped animals are not included in any other charts in this report.

# Surveillance

## Surveillance Stages

Surveillance objectives for scrapie will be addressed in three stages:

- **Stage 1.** Eradicate scrapie in the U.S. sheep & goat population by finding remaining cases.
- **Stage 2.** Continue high-level surveillance to ensure that no cases remain.
- **Stage 3.** Maintain sufficient ongoing monitoring to meet World Organisation for Animal Health (WOAH) requirements.

A sampling rate of 6/1000 breeding ewes or does is used for stage 1 minimums, and a sampling rate of 4/1000 breeding ewes or does is used for stage 2 minimums.

For Stage 1 states to be eligible to progress to Stage 2 they must achieve 90% or more of their annual state minimums for 4 out of the past 5 years and not have had a positive scrapie case for a minimum of 7 years.

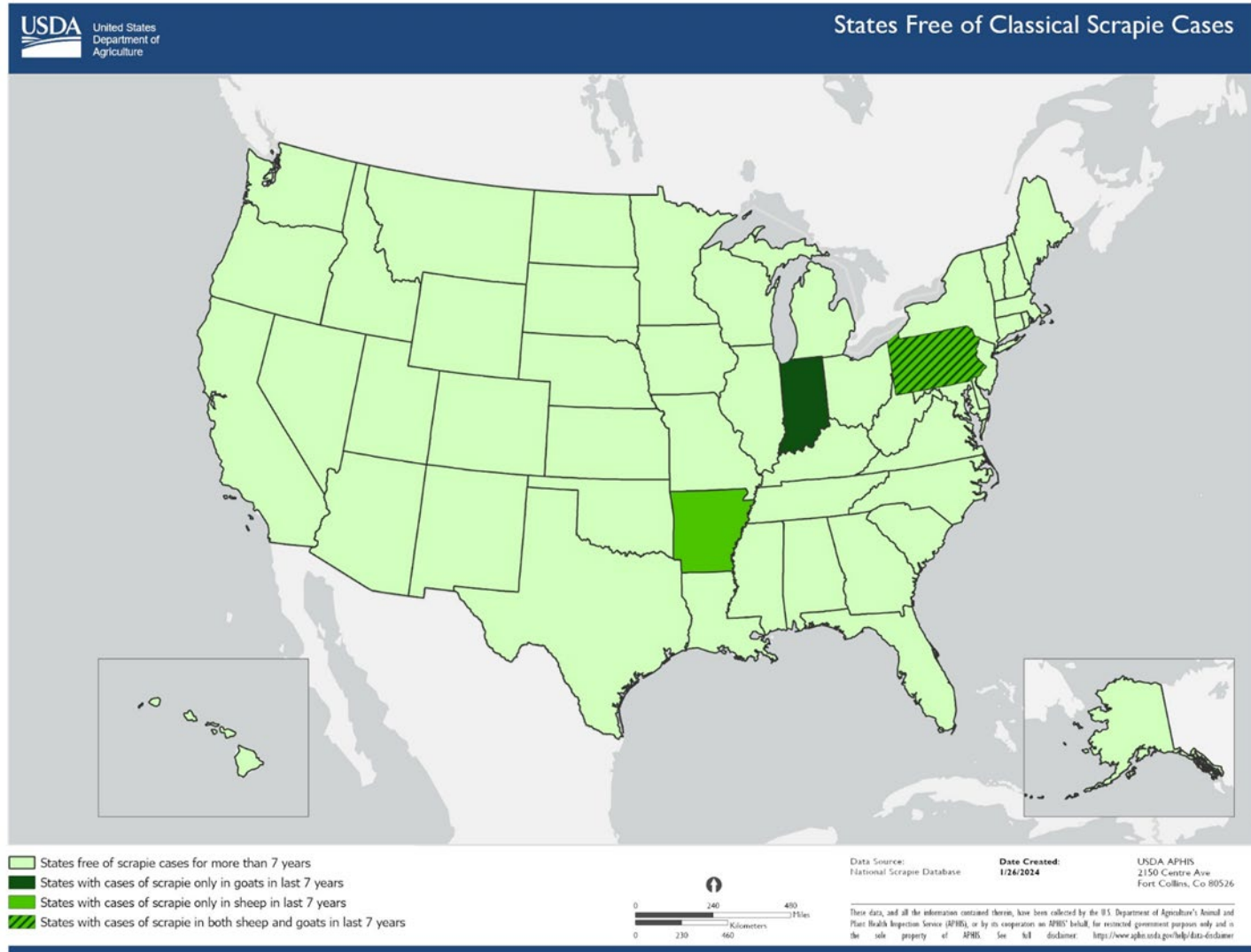
[Figure 7](#), [Figure 8](#) and [Figure 9](#) show the sampling stage of each state for sheep for FY 2022, FY 2023, and FY 2024 respectively.

For goats, the sampling minimum was set at stage 2 sampling levels in order to allow time for implementation of goat ID requirements. Any state that has a positive goat going forward will be moved to stage 1.

## *Conclusion*

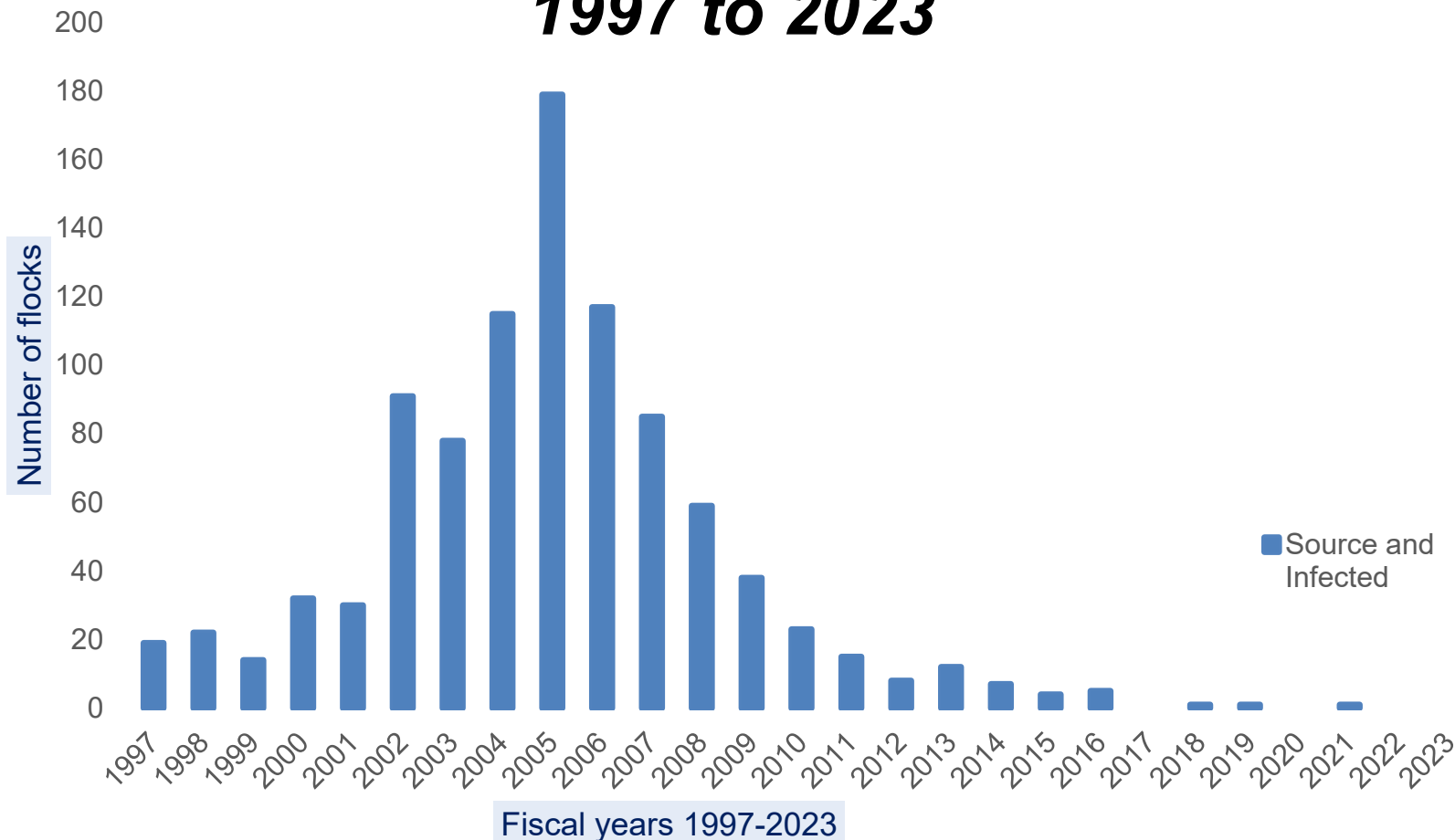
- Meeting sampling minimums was challenging for states due to HPAI impacts on ability of personnel to collect samples
- Most states met their sampling minimums for sheep and goats
- The remainder of this report contains figures, tables, and charts to accompany the previous slides

# States Free of Classical Scrapie Cases > 7 Years



\* As of September 30, 2023

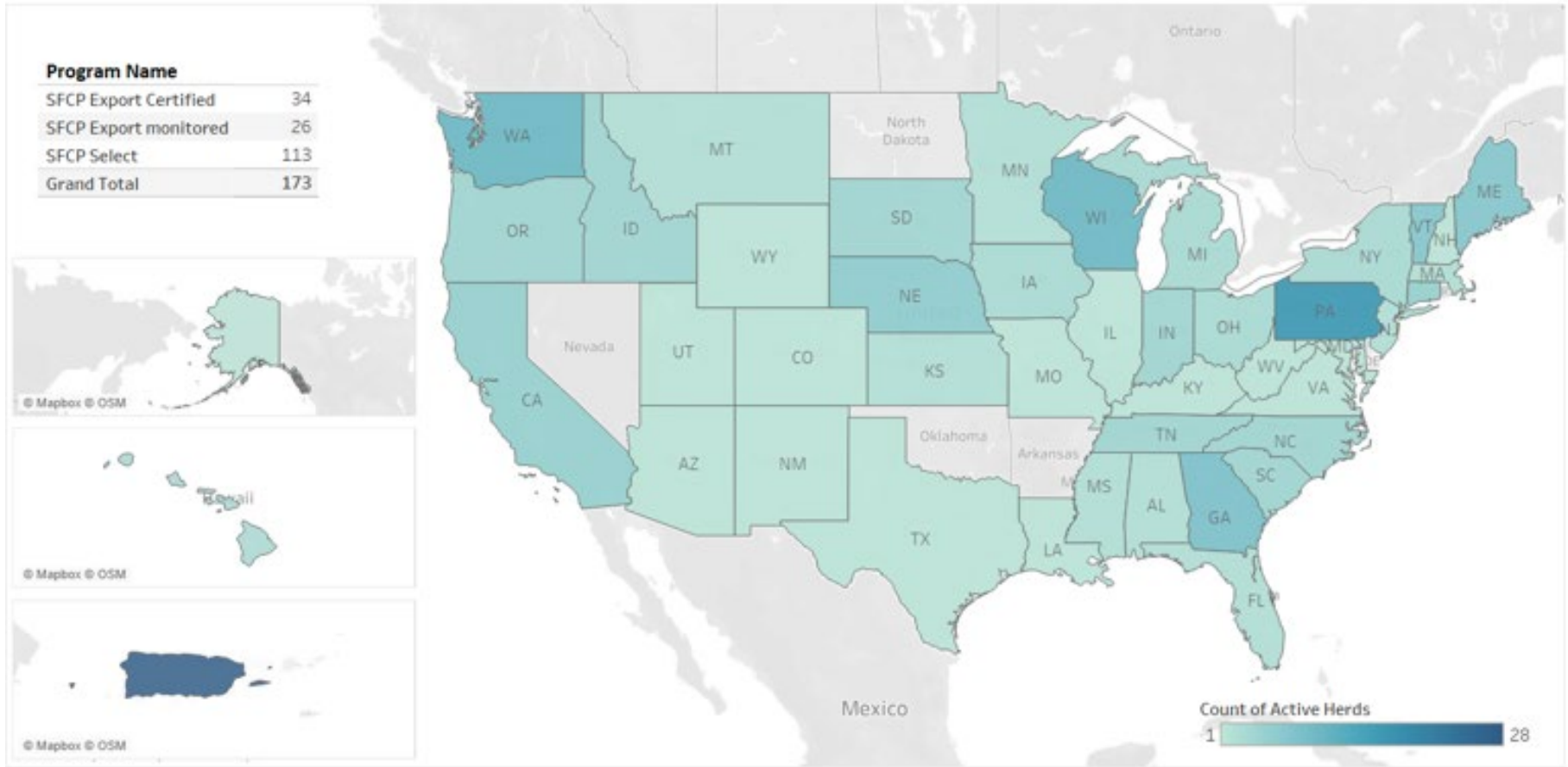
# Source and Infected Flocks: *Fiscal Years* 1997 to 2023



**Recent Positive Animals** – One sheep sampled at slaughter in January of FY 2021 tested positive for classical scrapie. This sheep had resided in a flock in Wisconsin, and VS attributed the flock of origin to Arkansas; In June of FY 2023, one sheep tested positive at slaughter for non-classical scrapie (Nor98-like).

As of September 30, 2023.

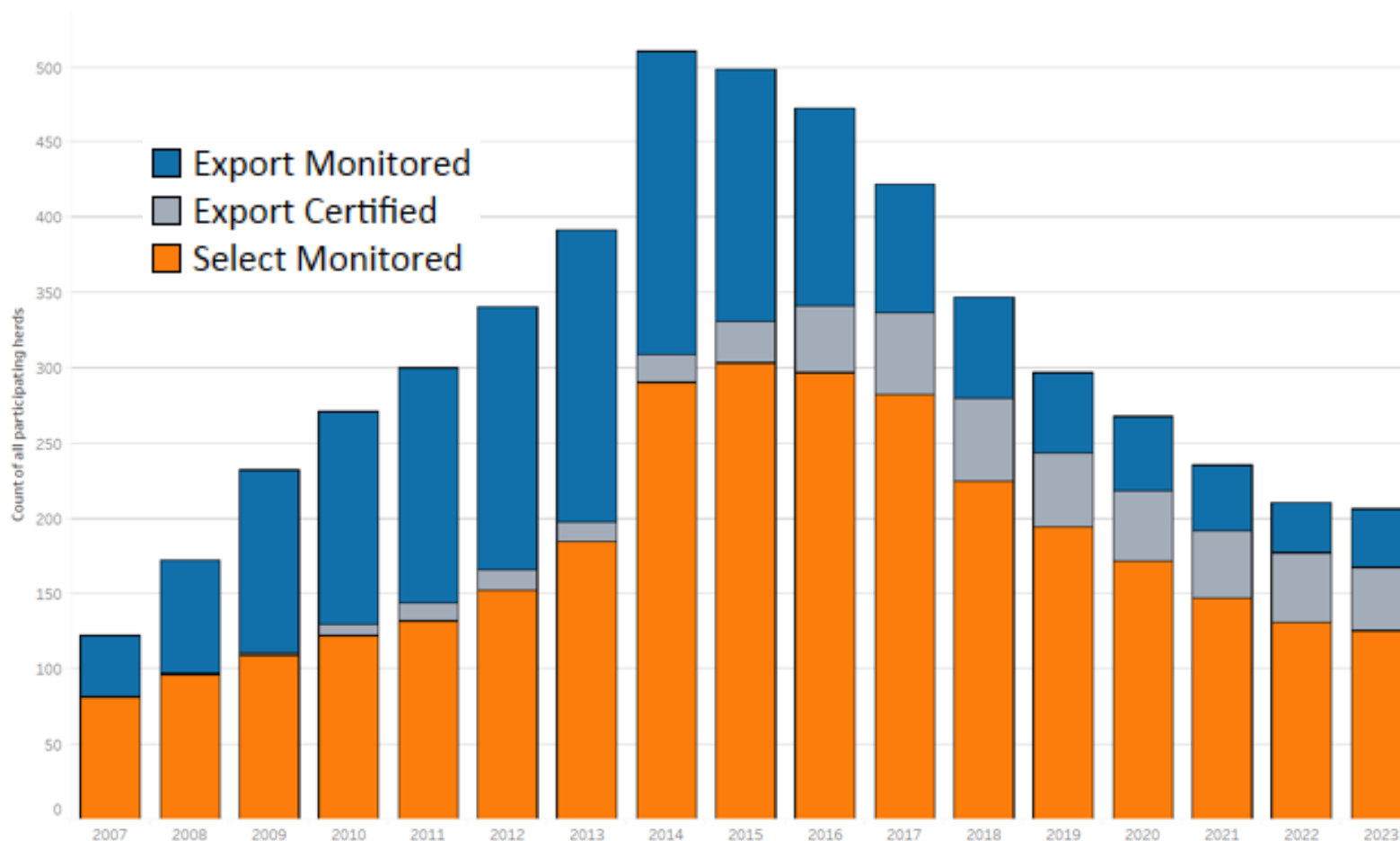
# Scrapie Free Flock Certification Program: Participating Flocks and Herds



(Figure 2)

# SFCP Participating Flocks Based on Status Date

## *FY 2007 to FY 2023*

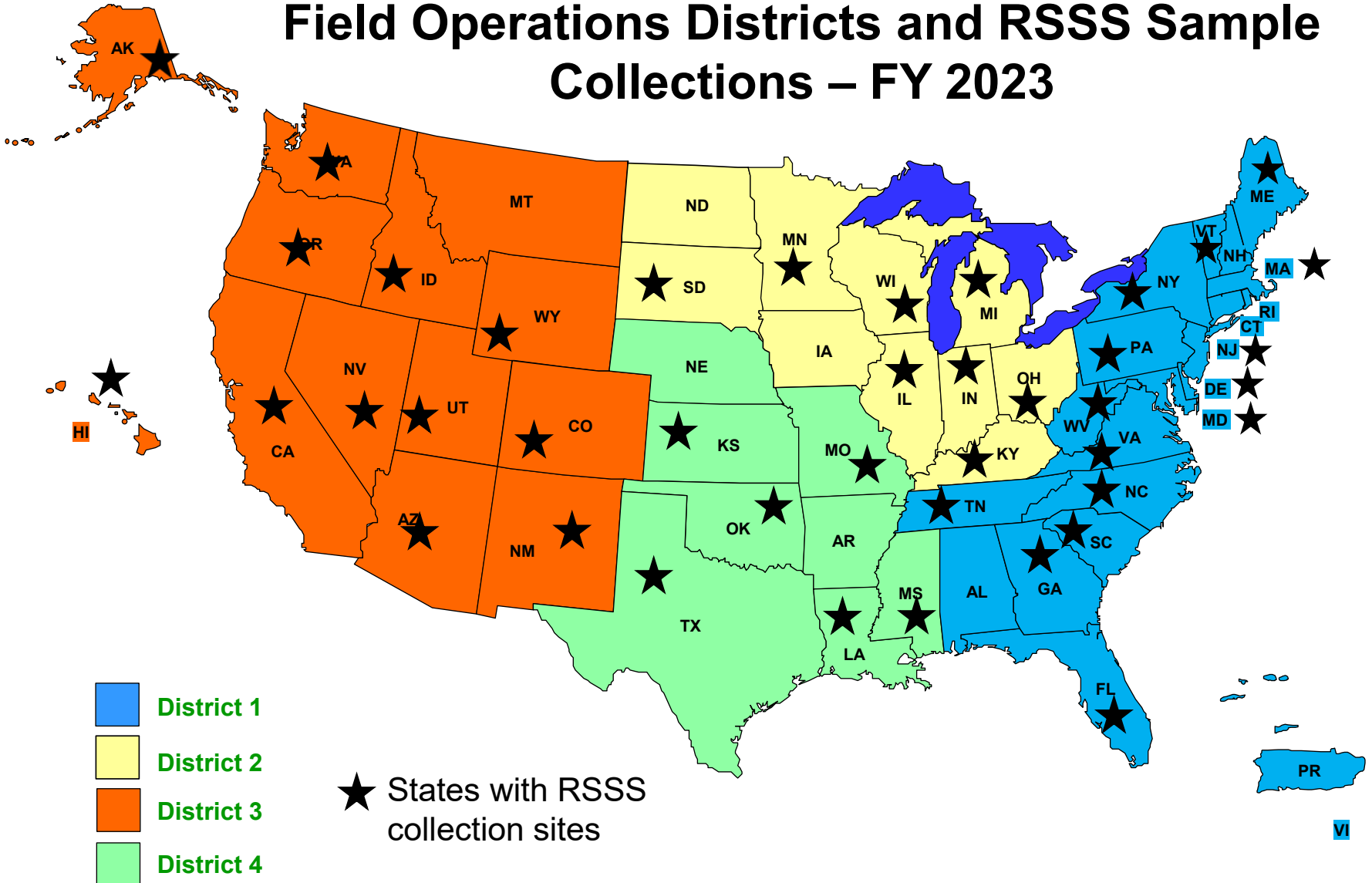


**(Chart 2)**

Represents the cumulative change in SFCP enrollment over time, and includes open and closed statuses/programs, and active and inactive flocks/herds. Chart is based on current or last status date; many participating flocks were grandfathered into Export program in 2013 with earlier status date.

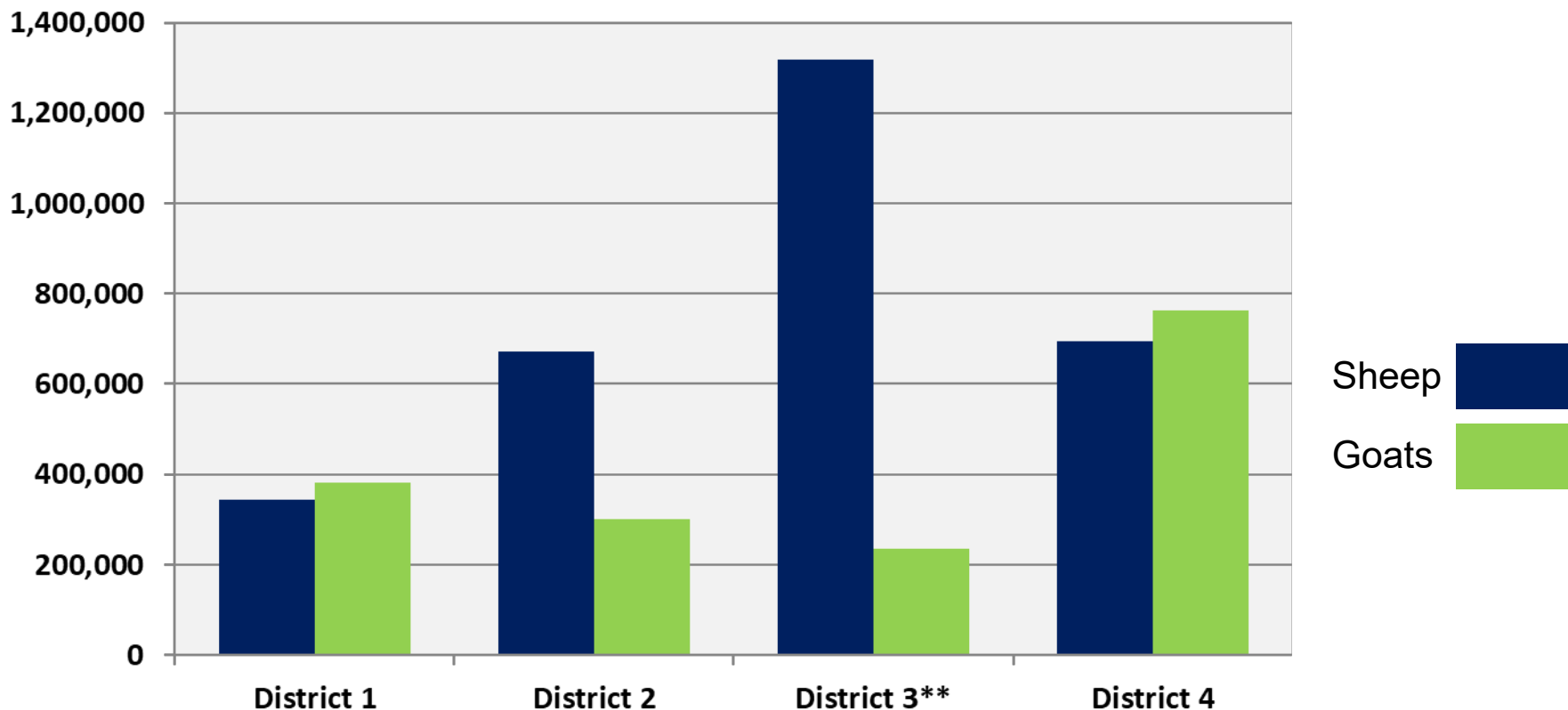


# Field Operations Districts and RSSS Sample Collections – FY 2023



(Figure 3)

# Total Breeding Adult Sheep and Goat Populations by District\*



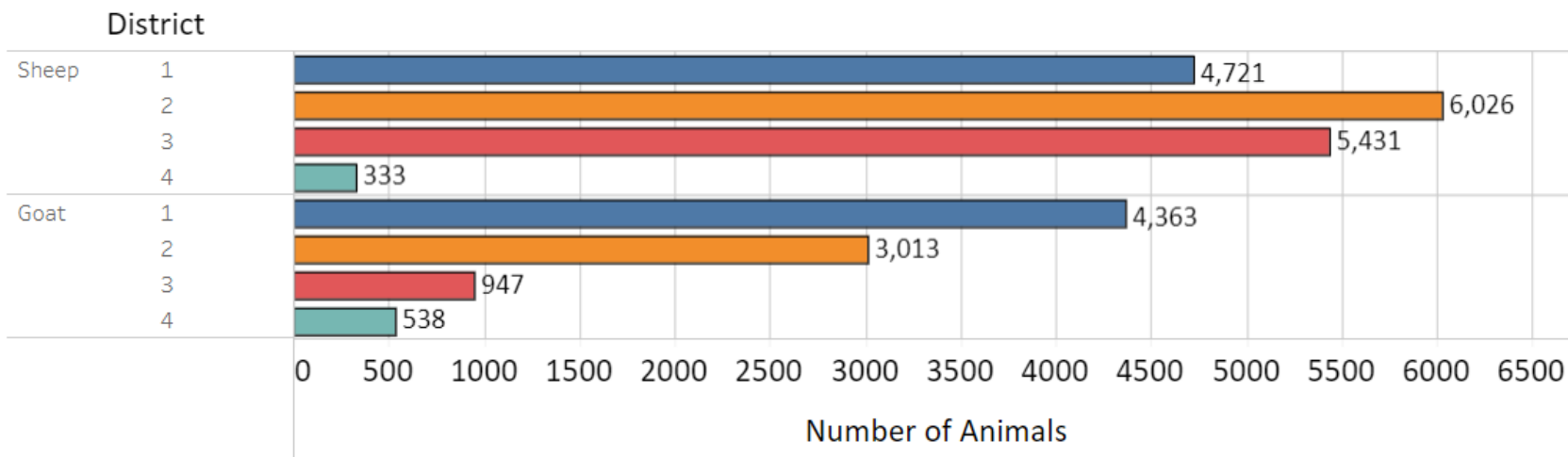
(Chart 3)

\* Source: NASS Sheep and Goat, January 31, 2023.

\*\* Does not include sheep and goats residing on the Navajo Nation.

# Total RSSS Samples Collected by District

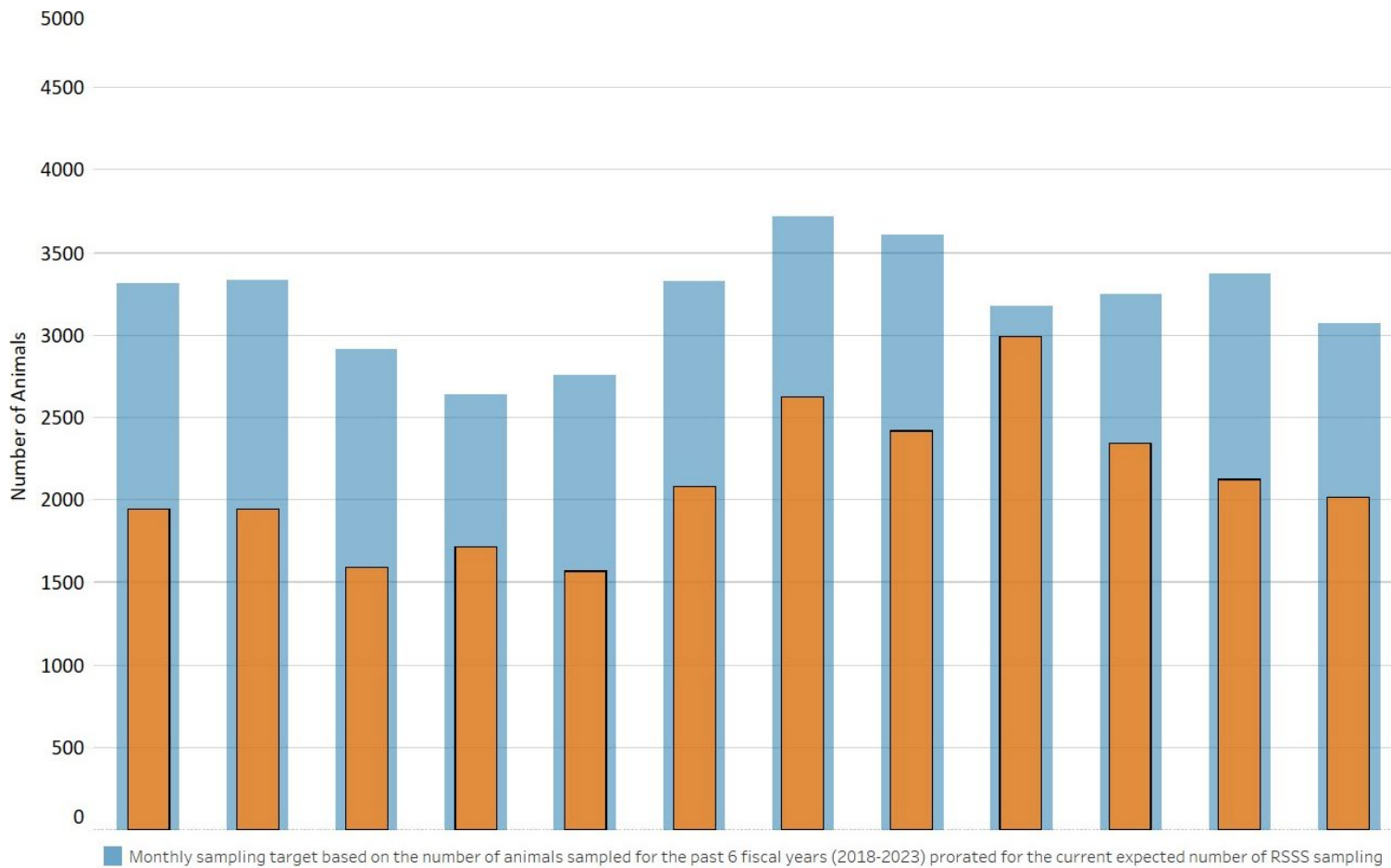
## FY 2023



(Chart 4)



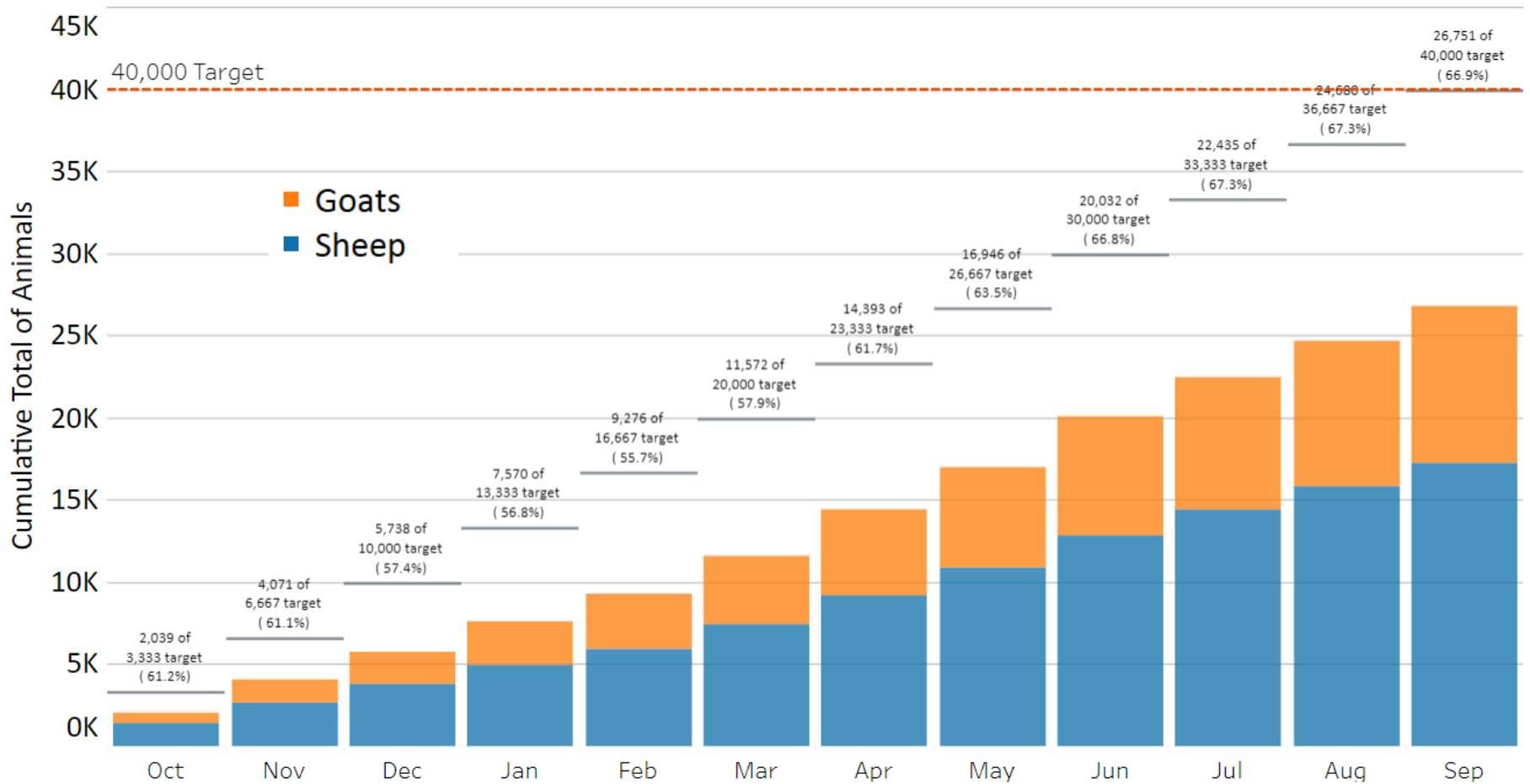
# Comparison by Month of RSSS Samples Collected in FY 2023 to Average of FY 2017 – FY 2022



(Chart 5)

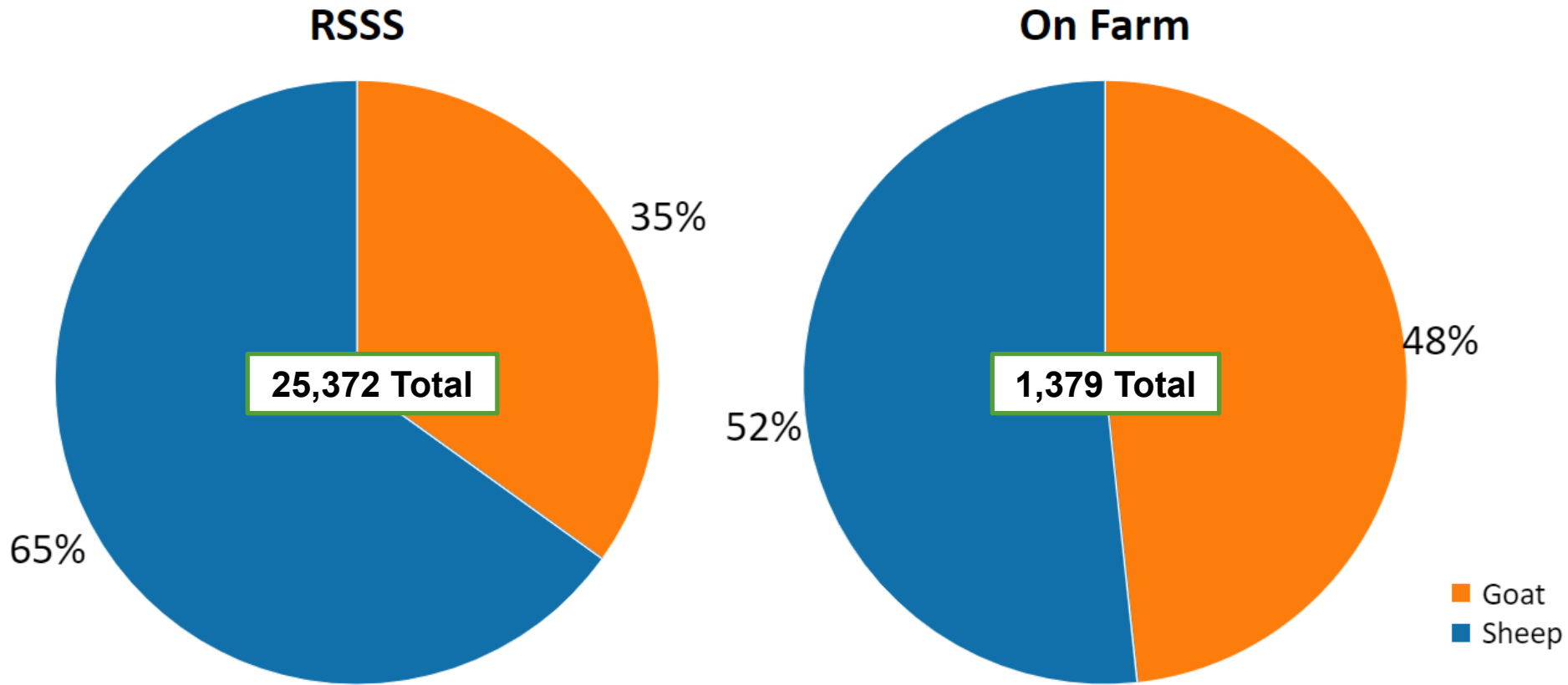
# Cumulative Number of Animals Sampled by Month

## FY 2023



(Chart 6)

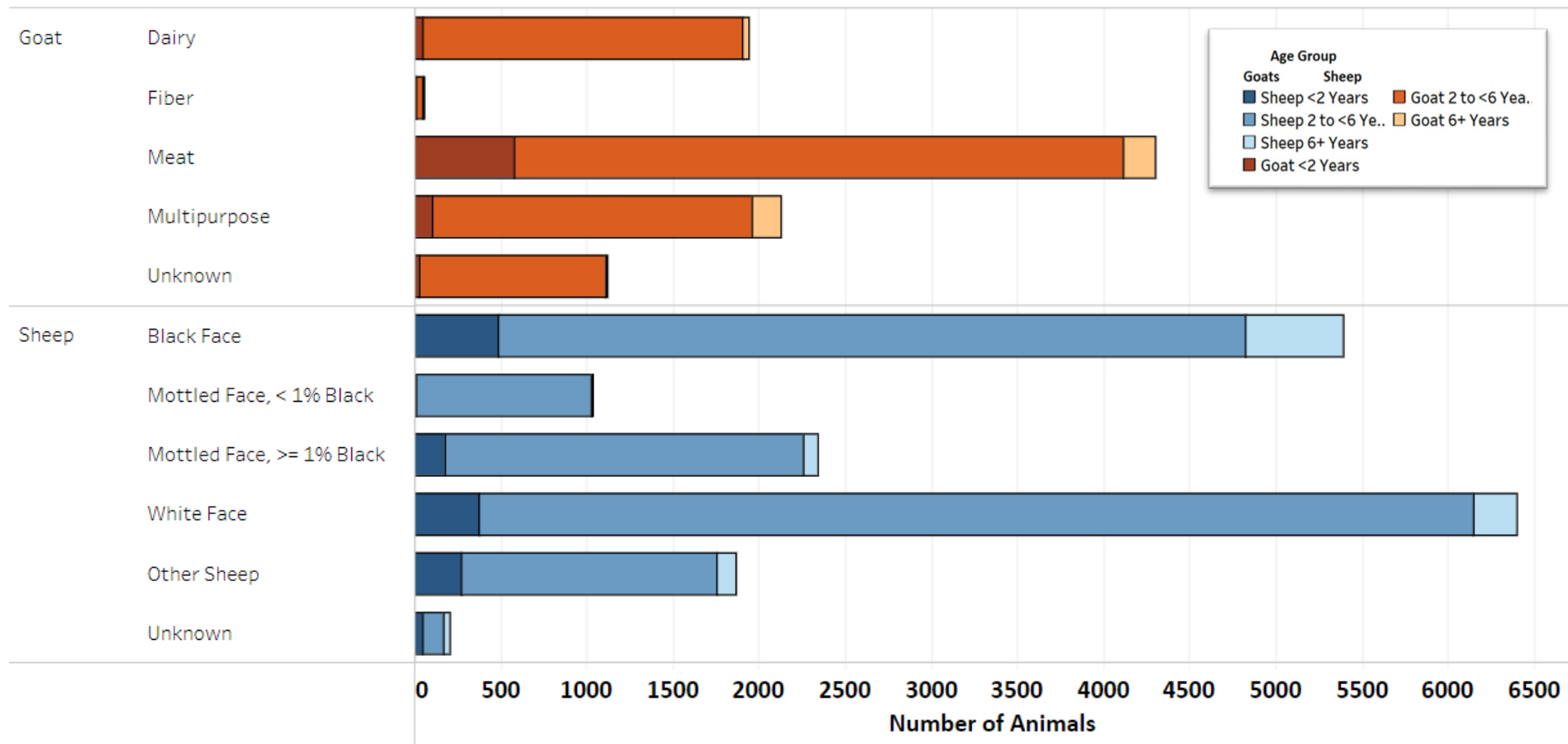
# RSSS and On-Farm Surveillance Sampling by Species *FY 2023*



(Chart 7)

# RSSS and On-Farm Surveillance Testing by Species

## FY 2023



(Chart 8)



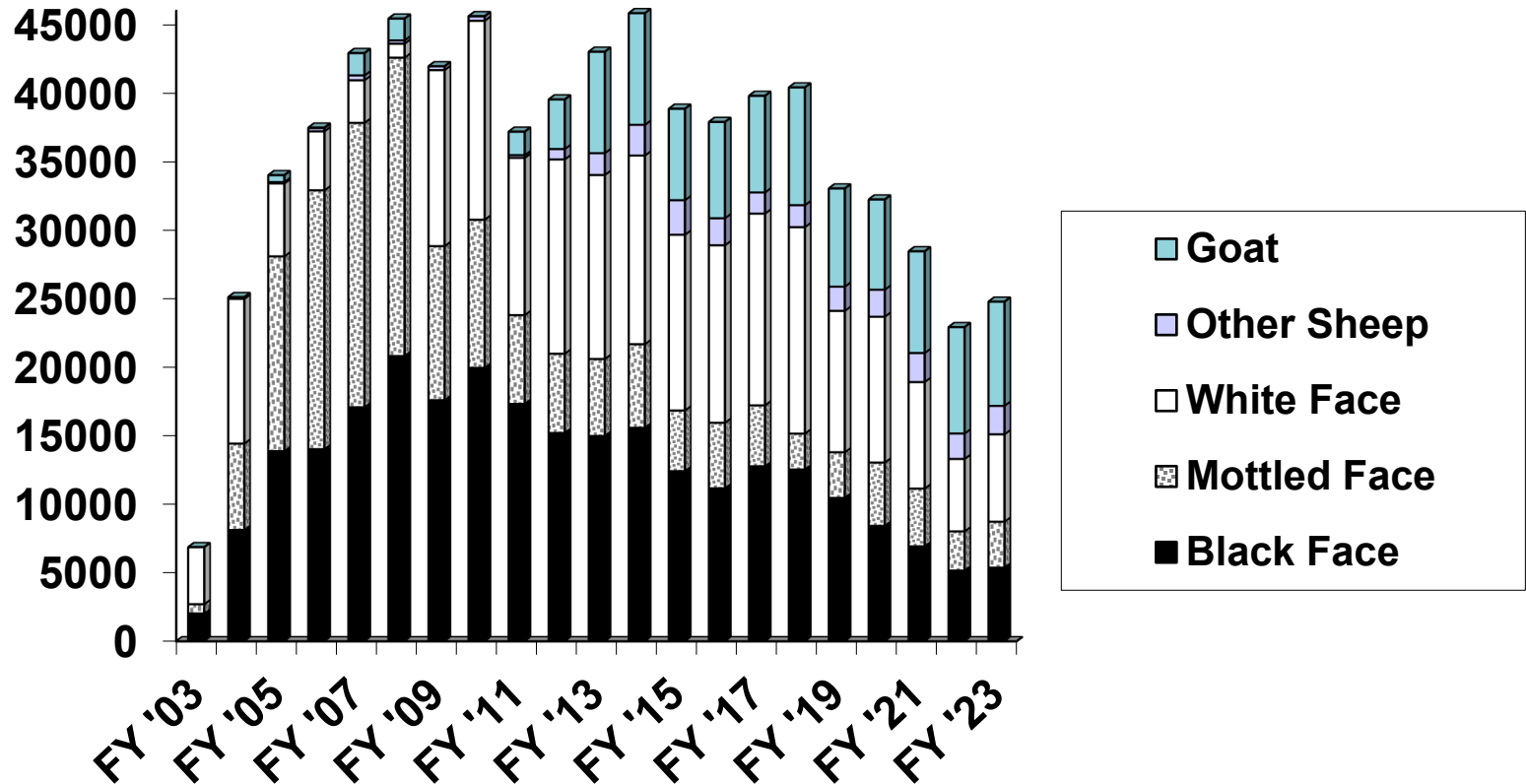
# RSSS and On-Farm Surveillance Testing by Species FY 2023

| Species            | Type                      | Age Group |               |          | Grand Total |
|--------------------|---------------------------|-----------|---------------|----------|-------------|
|                    |                           | <2 Years  | 2 to <6 Years | 6+ Years |             |
| Goat               | Dairy                     | 47        | 1,855         | 36       | 1,938       |
|                    | Fiber                     | 7         | 35            | 2        | 44          |
|                    | Meat                      | 574       | 3,537         | 188      | 4,299       |
|                    | Multipurpose              | 104       | 1,859         | 168      | 2,131       |
|                    | Unknown                   | 30        | 1,078         | 7        | 1,115       |
|                    | <b>Total</b>              |           | 762           | 8,364    | 401         |
| Sheep              | Black Face                | 484       | 4,342         | 567      | 5,393       |
|                    | Mottled Face, < 1% Black  | 5         | 1,017         | 3        | 1,025       |
|                    | Mottled Face, >= 1% Black | 180       | 2,074         | 83       | 2,337       |
|                    | White Face                | 369       | 5,782         | 245      | 6,396       |
|                    | Other Sheep               | 272       | 1,479         | 115      | 1,866       |
|                    | Unknown                   | 45        | 124           | 38       | 207         |
|                    | <b>Total</b>              |           | 1,355         | 14,818   | 1,051       |
| <b>Grand Total</b> |                           | 2,117     | 23,182        | 1,452    | 26,751      |

**(Table 1)**

Darker shading represents greater number of animals tested that met targeting criteria.

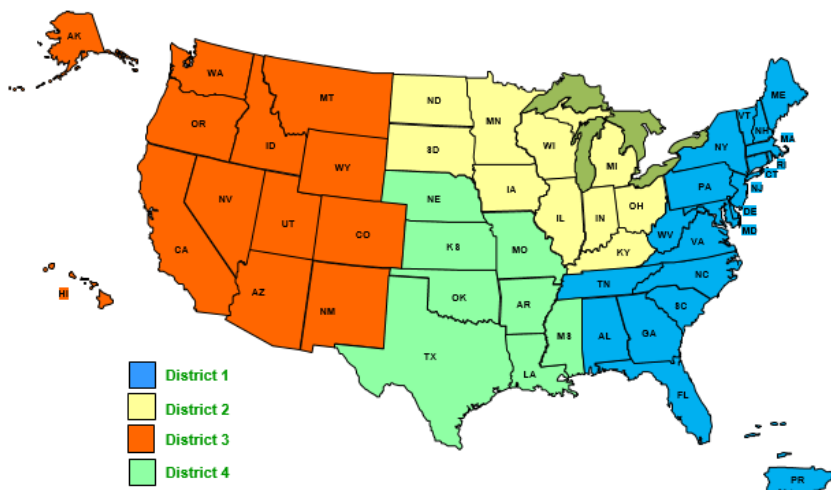
# Surveillance Samples Collected at Slaughter FY 2003 – 2023



(Chart 9)

Other sheep includes hair sheep, and sheep with gray, red, or unknown face color. Chart includes animals collected for RSSS & CSPS.

# FY 2023 Sheep and Goat State Sampling Minimums and State Collections - District 1

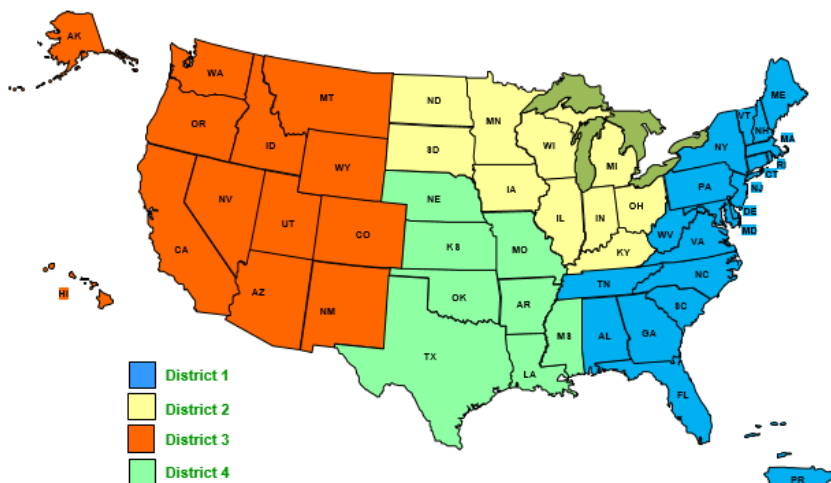


| State          | Sheep                  |                       |                          | Goat                   |                       |                          |
|----------------|------------------------|-----------------------|--------------------------|------------------------|-----------------------|--------------------------|
|                | Number Sampled FY 2023 | Total Credits FY 2023 | Sampling Minimum FY 2023 | Number Sampled FY 2023 | Total Credits FY 2023 | Sampling Minimum FY 2023 |
| Alabama        | 80                     | 78.0                  | 43                       | 129                    | 122.5                 | 106                      |
| Connecticut    | 37                     | 37.5                  | 14                       | 26                     | 25.5                  | 12                       |
| Delaware       | 2                      | 2.0                   | 3                        | 3                      | 2.5                   | 3                        |
| Florida        | 51                     | 50.0                  | 38                       | 125                    | 130.0                 | 117                      |
| Georgia        | 107                    | 106.5                 | 43                       | 202                    | 212.5                 | 148                      |
| Maine          | 57                     | 57.5                  | 30                       | 3                      | 3.0                   | 13                       |
| Maryland       | 138                    | 138.5                 | 41                       | 109                    | 104.5                 | 29                       |
| Massachusetts  | 352                    | 352.0                 | 30                       | 56                     | 57.5                  | 17                       |
| New Hampshire  | 95                     | 94.5                  | 19                       | 8                      | 8.0                   | 9                        |
| New Jersey     | 79                     | 79.5                  | 31                       | 32                     | 38.5                  | 23                       |
| New York       | 301                    | 304.5                 | 196                      | 163                    | 172.5                 | 76                       |
| North Carolina | 147                    | 156.0                 | 68                       | 182                    | 183.5                 | 111                      |
| Pennsylvania   | 663                    | 671.0                 | 360                      | 422                    | 430.0                 | 129                      |
| Rhode Island   | 42                     | 42.5                  | 4                        | 4                      | 4.0                   | 2                        |
| South Carolina | 63                     | 62.5                  | 22                       | 146                    | 145.5                 | 89                       |
| Tennessee      | 665                    | 665.0                 | 120                      | 452                    | 456.0                 | 236                      |
| Vermont        | 79                     | 80.5                  | 39                       | 12                     | 10.0                  | 21                       |
| Virginia       | 307                    | 311.5                 | 184                      | 382                    | 380.5                 | 108                      |
| West Virginia  | 155                    | 158.5                 | 88                       | 110                    | 118.5                 | 55                       |

(Table 2)

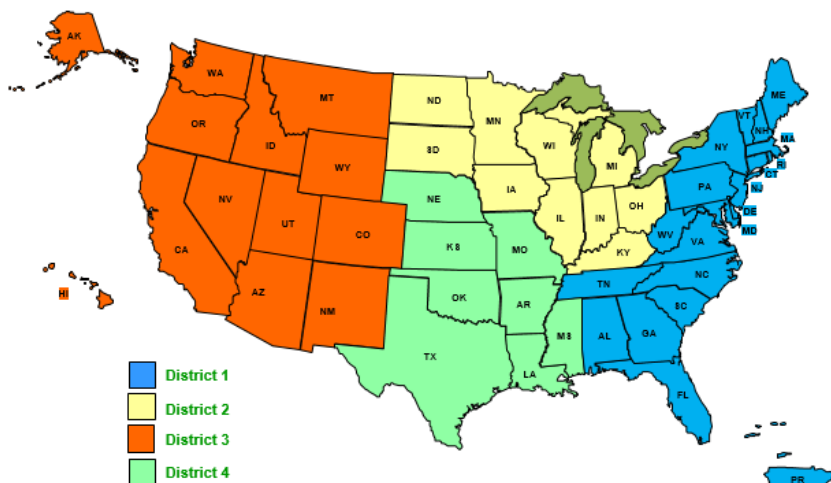
# FY 2023 Sheep and Goat State Sampling Minimums and State Collections - District 2

| State        | Sheep                  |                       |                          | Goat                   |                       |                          |
|--------------|------------------------|-----------------------|--------------------------|------------------------|-----------------------|--------------------------|
|              | Number Sampled FY 2023 | Total Credits FY 2023 | Sampling Minimum FY 2023 | Number Sampled FY 2023 | Total Credits FY 2023 | Sampling Minimum FY 2023 |
| Illinois     | 295                    | 296.5                 | 140                      | 196                    | 195.5                 | 77                       |
| Indiana      | 627                    | 635.5                 | 234                      | 323                    | 341.5                 | 124                      |
| Iowa         | 761                    | 752.5                 | 348                      | 436                    | 437.5                 | 172                      |
| Kentucky     | 699                    | 693.5                 | 144                      | 375                    | 378.5                 | 145                      |
| Michigan     | 871                    | 871.0                 | 184                      | 139                    | 157.5                 | 68                       |
| Minnesota    | 742                    | 740.0                 | 252                      | 218                    | 216.0                 | 97                       |
| North Dakota | 442                    | 442.5                 | 172                      | 27                     | 26.5                  | 14                       |
| Ohio         | 709                    | 707.5                 | 304                      | 428                    | 427.5                 | 130                      |
| South Dakota | 944                    | 942.0                 | 584                      | 34                     | 34.0                  | 39                       |
| Wisconsin    | 445                    | 433.5                 | 200                      | 320                    | 318.0                 | 229                      |



(Table 3)

# FY 2023 Sheep and Goat State Sampling Minimums and State Collections - District 3

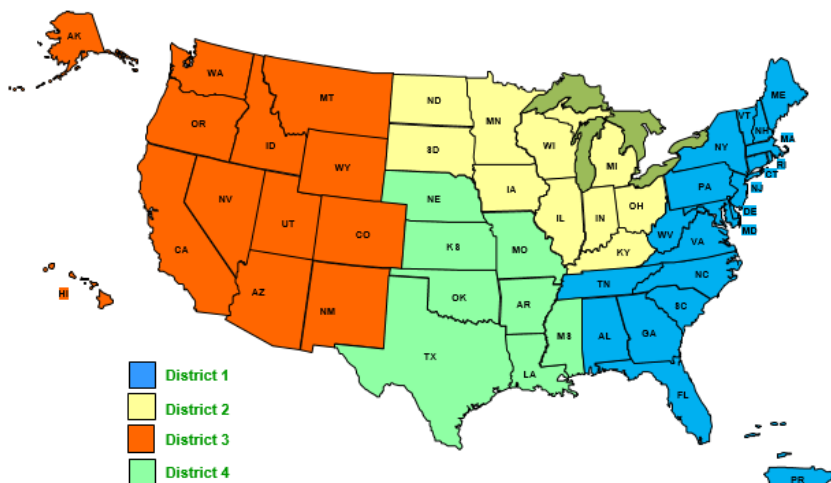


| State <sup>A</sup> <sub>2+</sub> ▼ | Sheep                  |                       |                          | Goat                   |                       |                          |
|------------------------------------|------------------------|-----------------------|--------------------------|------------------------|-----------------------|--------------------------|
|                                    | Number Sampled FY 2023 | Total Credits FY 2023 | Sampling Minimum FY 2023 | Number Sampled FY 2023 | Total Credits FY 2023 | Sampling Minimum FY 2023 |
| Alaska                             | 4                      | 2.5                   | 1                        | 0                      | 0.0                   | 2                        |
| Arizona                            | 111                    | 110.5                 | 84                       | 30                     | 29.5                  | 31                       |
| California                         | 679                    | 681.0                 | 875                      | 260                    | 259.0                 | 312                      |
| Colorado                           | 1,023                  | 1023.0                | 620                      | 316                    | 318.0                 | 80                       |
| Hawaii                             | 62                     | 61.0                  | 47                       | 20                     | 19.0                  | 36                       |
| Idaho                              | 726                    | 722.0                 | 452                      | 80                     | 79.0                  | 56                       |
| Montana                            | 632                    | 629.0                 | 488                      | 48                     | 48.0                  | 30                       |
| Nevada                             | 330                    | 331.0                 | 264                      | 34                     | 33.5                  | 26                       |
| New Mexico                         | 136                    | 134.5                 | 86                       | 76                     | 75.5                  | 30                       |
| Oregon                             | 443                    | 436.5                 | 300                      | 147                    | 146.0                 | 96                       |
| Utah                               | 704                    | 704.0                 | 698                      | 70                     | 69.0                  | 36                       |
| Washington                         | 247                    | 235.5                 | 112                      | 184                    | 180.5                 | 72                       |
| Wyoming                            | 661                    | 662.5                 | 860                      | 77                     | 76.5                  | 31                       |

(Table 4)

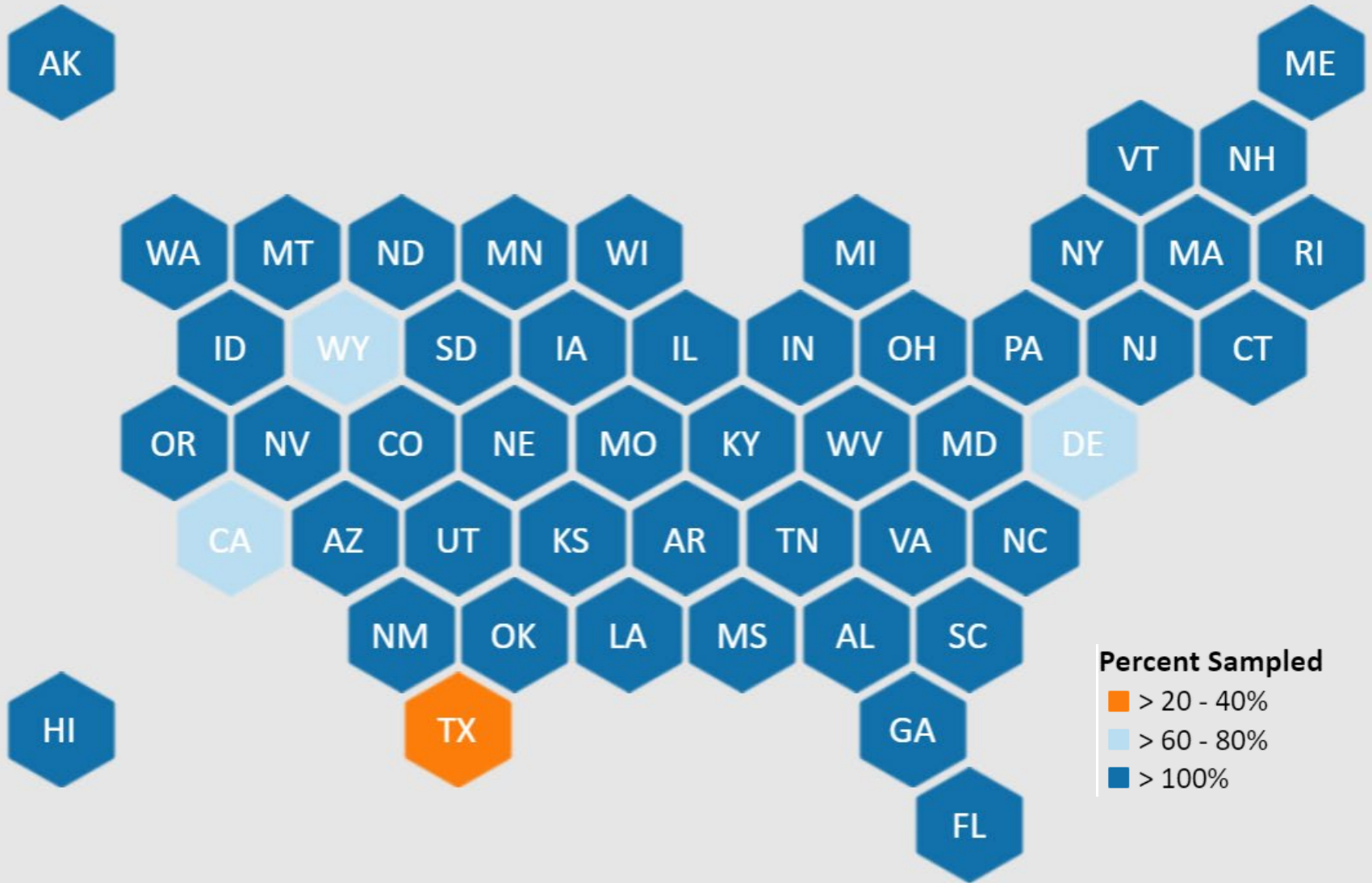
# FY 2023 Sheep and Goat State Sampling Minimums and State Collections - District 4

| State       | Sheep                  |                       |                          | Goat                   |                       |                          |
|-------------|------------------------|-----------------------|--------------------------|------------------------|-----------------------|--------------------------|
|             | Number Sampled FY 2023 | Total Credits FY 2023 | Sampling Minimum FY 2023 | Number Sampled FY 2023 | Total Credits FY 2023 | Sampling Minimum FY 2023 |
| Arkansas    | 77                     | 78.0                  | 38                       | 239                    | 239.0                 | 84                       |
| Kansas      | 234                    | 233.0                 | 140                      | 273                    | 272.0                 | 101                      |
| Louisiana   | 29                     | 28.5                  | 23                       | 48                     | 48.0                  | 42                       |
| Mississippi | 76                     | 75.5                  | 29                       | 136                    | 135.5                 | 52                       |
| Missouri    | 459                    | 466.0                 | 248                      | 574                    | 574.0                 | 209                      |
| Nebraska    | 361                    | 360.0                 | 196                      | 162                    | 161.0                 | 66                       |
| Oklahoma    | 129                    | 138.5                 | 124                      | 231                    | 231.0                 | 199                      |
| Texas       | 398                    | 397.0                 | 1000                     | 1,503                  | 1504.0                | 1000                     |



(Table 5)

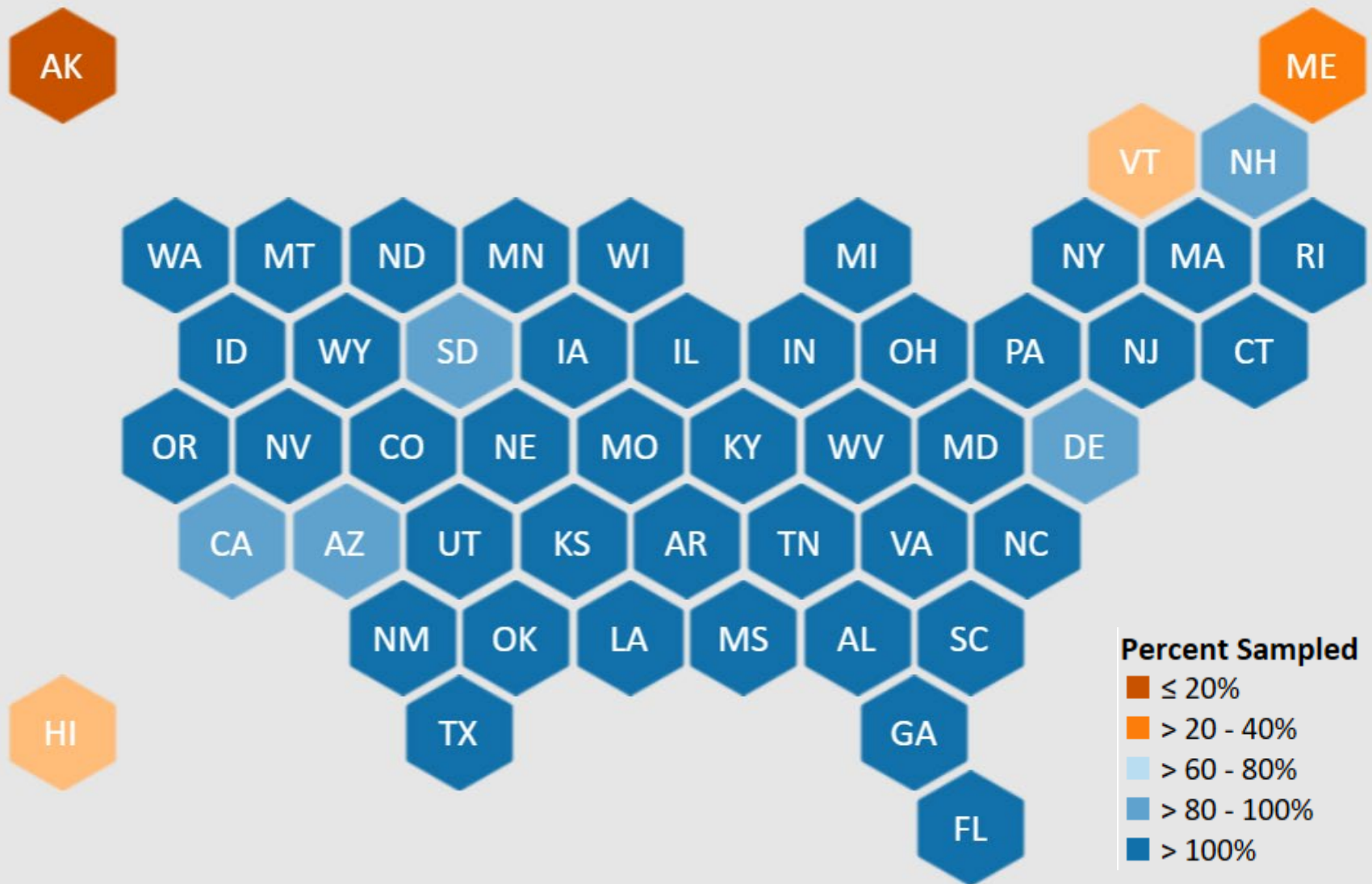
# Percent of Sampling Minimum Achieved in FY 2023 - RSSS and On-farm Surveillance - Sheep



(Figure 5)



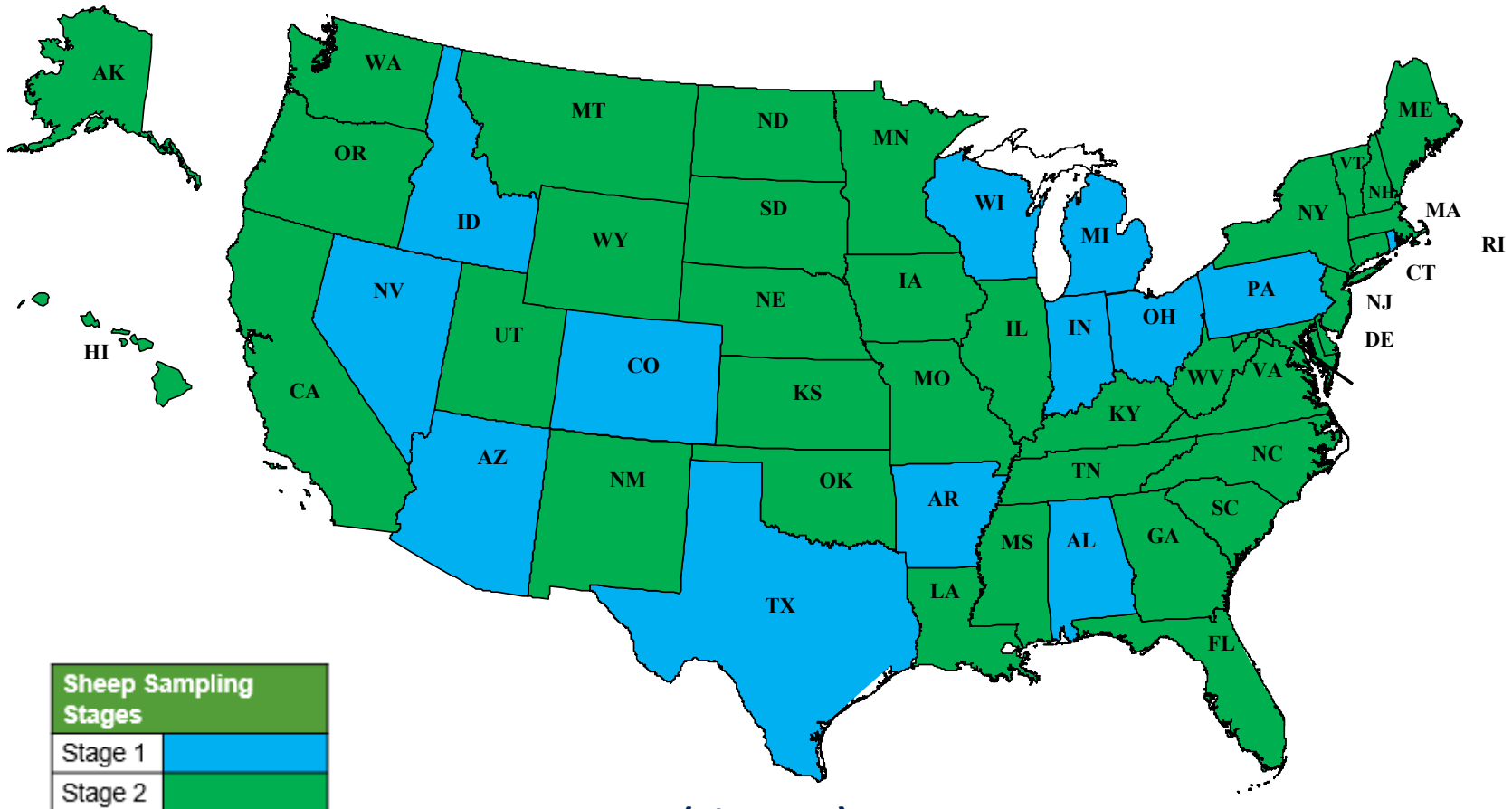
# Percent of Sampling Minimum Achieved in FY 2023 - RSSS and On-farm Surveillance - Goats



(Figure 6)

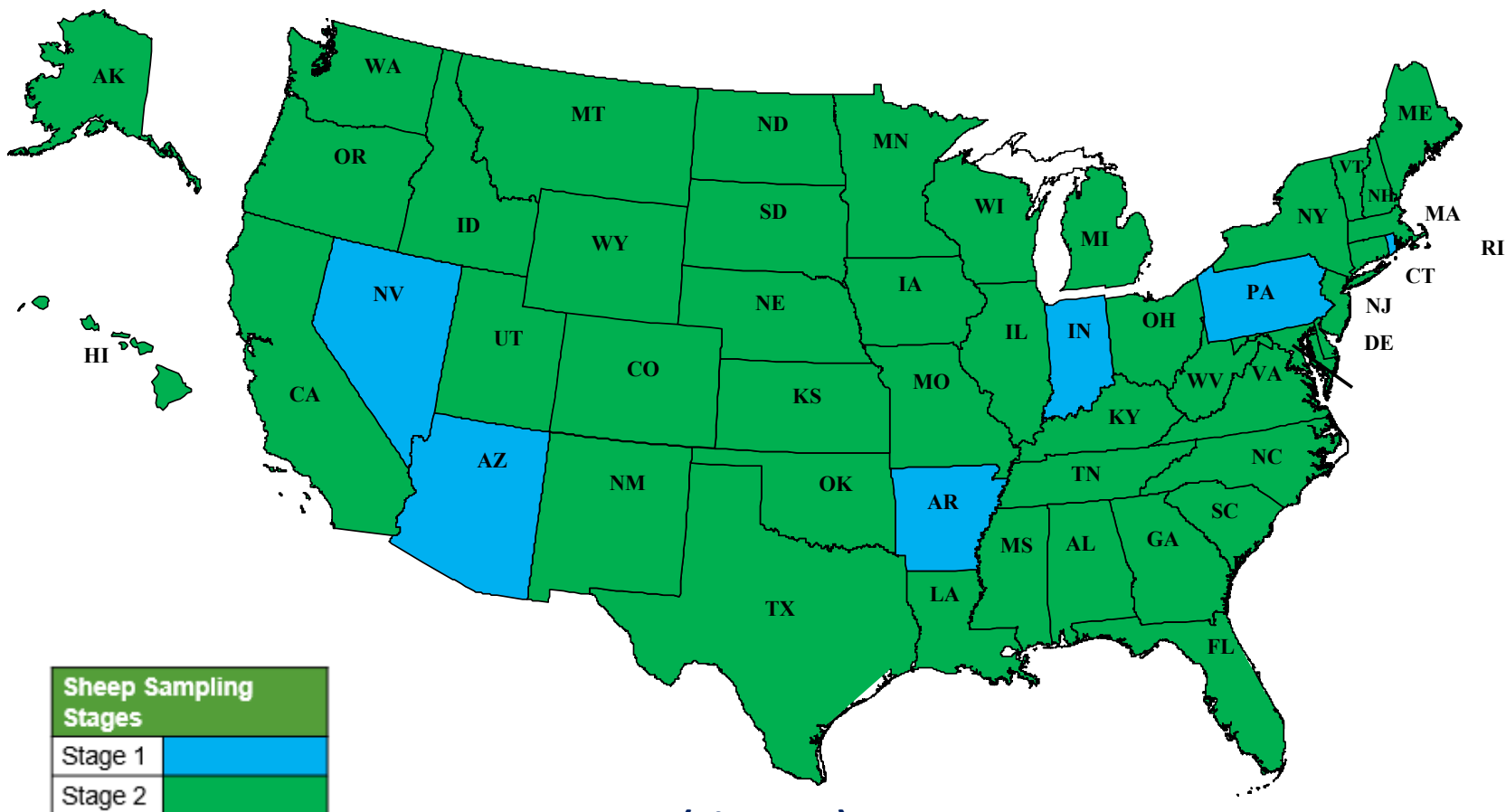


# FY 2022 Sheep Surveillance Sampling Stages



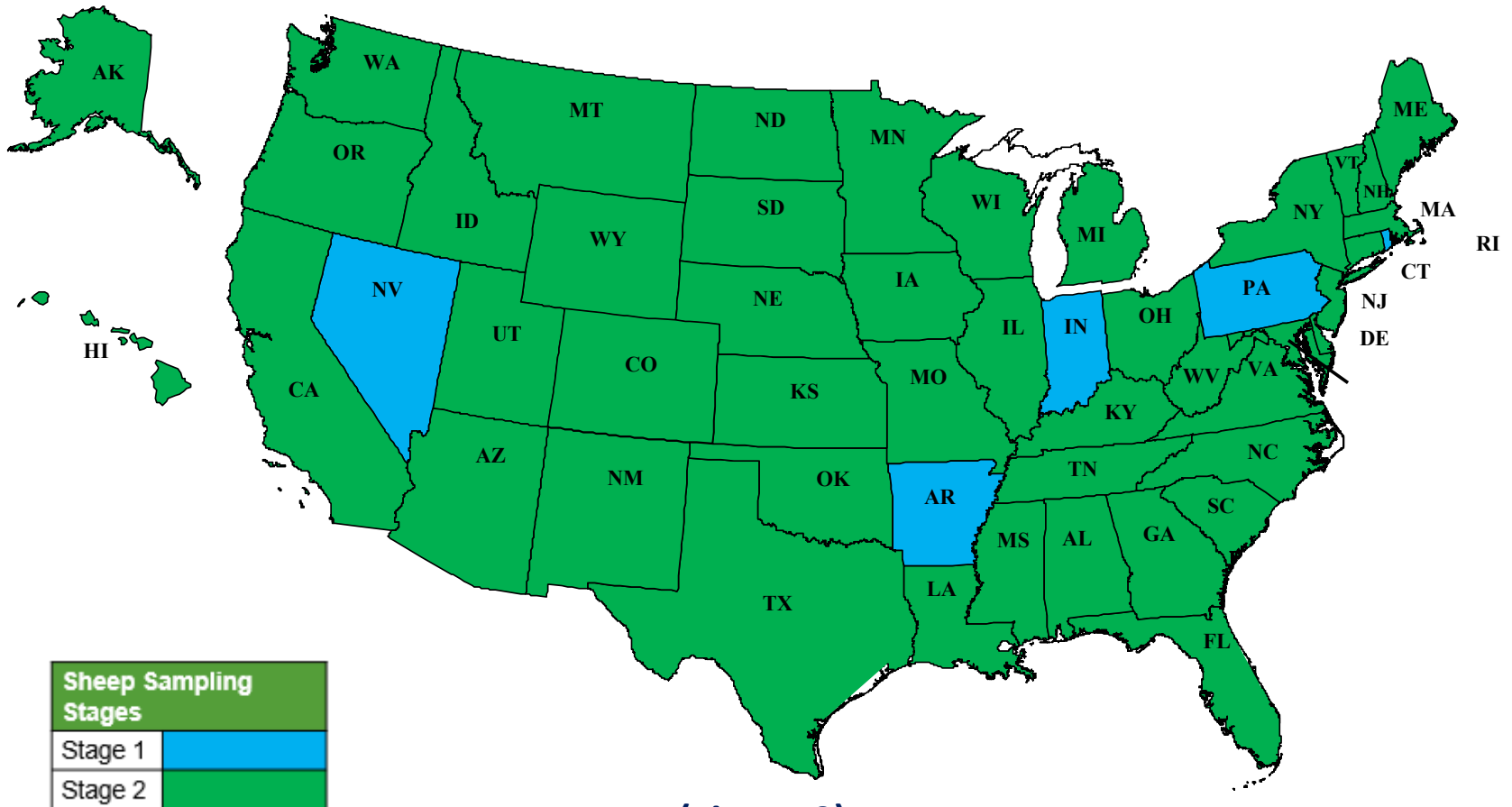
(Figure 7)

# FY 2023 Sheep Surveillance Sampling Stages



(Figure 8)

# FY 2024 Sheep Surveillance Sampling Stages



(Figure 9)