National Scrapie Eradication Program

August 2019 Monthly Report
Fiscal Year 2019

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Veterinary Services
Ruminant Health Center, Strategy and Policy
Small Ruminant Health

September 16, 2019
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 1st page of the Introduction

Please note the following:

- The links and action buttons only work when the presentation is viewed in slide show mode
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- The links may not have the same functionality if viewed using PowerPoint 2003 or earlier
- The links may become “frozen” if the viewer navigates through the presentation quickly; if this happens, return to the first slide and begin again to reset
Program Summary

**Performance Measures** – The percent of cull black-faced sheep found positive at slaughter ([Chart 1](#)) and the percent of cull sheep found positive at slaughter and adjusted for face color\(^1\) ([Chart 2](#)) remains at 0 percent. The retrospective 6-month rolling average of the percent positive, black-faced sheep sampled at RSSS collection sites has been 0 since June 2016.

**Positive Animals\(^2\)** – Classical scrapie was confirmed in a goat with an Indiana eartag; the goat was sampled at slaughter in June 2019. In October 2018, samples from five sheep and one goat from a source flock in Pennsylvania tested positive for classical scrapie. Three of the sheep were AVQR and two were VVQQ. Trace-back investigations of a positive goat slaughtered in July 2018 led to the herd of origin. An older, black-faced sheep tested at slaughter in November 2018 was diagnosed with Nor98-like scrapie, and was traced back to a Colorado flock. Another Nor98-like case was diagnosed in a mottled-faced sheep with a Colorado eartag; samples from this animal were collected in July 2019.

\(^{1}\)White, black and mottled-faced color sheep are weighted based on population; white-faced sheep have the greatest weight. If a white-faced positive sheep is found, this statistic will markedly increase. See notes below.

\(^{2}\)Samples collected between October 1, 2018 and August 31, 2019, and confirmed by September 16, 2019.
**Program Summary**

**Infected and Source Flocks** - The herd of origin of the RSSS positive goat collected in June 2019 was designated as infected. Further investigation determined that one of the two herds was the likely birth herd of the positive goat. The test eligible goats in these herds were rectal biopsied with not detected results. The herds were placed on monitoring plans. The RSSS positive goat confirmed in August 2018 was traced to a Pennsylvania herd that has sheep and goats. The herd was designated as a source flock in September (Chart 3). This flock completed a flock cleanup plan and the source status is closed. One other flock in Texas has an open infected status since April 2016, but there are no exposed animals on the premises. Cleaning and disinfection of the premises has to be completed before the status can be closed.

**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. Figure 1 shows the number of positive cases by State and by fiscal year of last reported case.
Program Summary

Scrapie Free Flock Certification Program (SFCP) – As of August 31, 2019, there were 237 flocks participating in the Scrapie Free Flock Certification Program (SFCP). Statuses of these flocks were 49 export monitored, 43 export certified, and 145 select monitored flocks (Figure 2). SFCP open statuses by fiscal year of Status date\(^3\) from FY 2007 to FY 2019 are depicted in Chart 4.

\(^3\)Chart 4 represents the cumulative change in SFCP enrollment over time, and includes open and closed statuses/programs, and active and inactive flocks/herds. Previous charts of SFCP participation by year were manually updated and used the enrollment date to determine the year of participation in SFCP. With the change to Tableau charts, the start/status date is used. Many participating flocks were grandfathered into the Export category in 2013 with an earlier status date.
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. The distribution of sheep and goat populations by District is depicted in Chart 5.

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. Samples have been collected from 632,329 animals since April 1, 2003. There have been 488 NVSL confirmed positive animals (473 classical cases – 470 sheep and 3 goats, 14 Nor98-like cases, and 1 pending designation) since the beginning of RSSS. As of August 31, 2019, 30,603 samples have been collected in FY 2019, 24,128 from sheep and 6,475 from goats.  

4Total sampling is decreased due to the government shutdown from December 21, 2018 through January 25, 2019, and to deployments of field personnel to California in response to virulent New Castle’s disease outbreak.
Surveillance

Components of Scrapie Surveillance
• **RSSS Genotyping** – In November 2018, APHIS started a pilot project designed to decrease the costs of scrapie IHC testing by reducing the number of sheep that are tested for scrapie. Using a swab, a specimen for DNA analysis is collected at slaughter from each sheep, along with the obex and retropharyngeal lymph node. DNA is analyzed to determine the genotype at codon 171; tissue samples from genetically susceptible sheep are then tested for scrapie; samples from sheep that are not genetically susceptible are not tested. As of August 31, 2019, 1,881 sheep have been genotyped through this pilot, 1,529 of which are considered either genetically resistant or genetically less susceptible. Samples from genetically susceptible sheep were referred for scrapie testing, and to date, none have tested positive.

The number of sheep and goats collected in each District is shown in Chart 6. Figure 4 is a hex map, representing the number of animals collected in each State. Chart 7 compares RSSS sampling by month for the current year with the monthly average of the previous 4 years.

Sheep tested through RSSS Genotyping Pilot are included in the total number of sheep tested through RSSS.
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. As of August 31, 2019, 937 sheep and 652 goats have been tested on-farm for FY 2019. Five sheep and one goat in an infected flock tested positive.

Surveillance Goals

The annual target is to test at least 40,000 animals each year for scrapie. As of August 31, 2019, 32,192 animals have been sampled for scrapie testing in FY 2019.

- 30,603 RSSS samples and 1,589 on-farm samples
- Of which 25,065 were sheep and 7,127 were goats.

Progress towards meeting the national surveillance target is depicted in Chart 8. Distribution of sampling by type (RSSS or on-farm) and by species is shown in Chart 9. Chart 10 and Table 1 is a breakdown by face-color (sheep) and type (goats) by age.
Surveillance

State Sampling Minimums
The National Scrapie Eradication Program establishes annual sheep 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 State sampling minimums for sheep and goats, and the total number of animals sampled by State of Animal ID, are listed in in the following slides:

<table>
<thead>
<tr>
<th>District 1</th>
<th>Table 2</th>
<th>District 3</th>
<th>Table 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>District 2</td>
<td>Table 3</td>
<td>District 4</td>
<td>Table 5</td>
</tr>
</tbody>
</table>

The percent sampling minimum for sheep and goats achieved by each State in FY 2019 are depicted in Figure 6 and Figure 7.

This report is based on information and test results available at the time of report generation. Numbers are subject to change due to later reporting of test results and updates in the database.
Percent of RSSS Sheep Samples that Tested Positive for Classical Scrapie - By Face Color

FY 2003 – FY 2019*

* As of August 31, 2019. Adjusted to exclude multiple positive animals from same flock. Mottled- and white-faced combined. Does not include Nor98-like scrapie cases found through RSSS.
Percent of RSSS Sheep Samples that Tested Positive for Classical Scrapie - Weighted by Face Color

FY 2003 – FY 2019*

* As of August 31, 2019. Adjusted to exclude multiple positive animals from the same flock. Does not include Nor98-like scrapie cases found through RSSS.
Infected and Source Flocks
New Statutes by Year – Fiscal Years 1997 to 2019*

* As of August 31, 2019
Scrapie Cases in Goats
FY 2002 – FY 2019

(Figure 1)

Color code indicates fiscal year of last case by State. 44 NVSL confirmed cases.
* States with 1 RSSS positive goat; samples collected November 2014, July 2018, and June 2019
Scrapie Free Flock Certification Program: Participating Flocks and Herds*

* As of August 31, 2019

<table>
<thead>
<tr>
<th>Program</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export Certified</td>
<td>43</td>
</tr>
<tr>
<td>Export Monitored</td>
<td>49</td>
</tr>
<tr>
<td>Select</td>
<td>145</td>
</tr>
<tr>
<td>Total</td>
<td>237</td>
</tr>
</tbody>
</table>

(Figure 2)
SFCP Participating Flocks Based on Status Date

FY 2007 to FY 2019*

* As of August 31, 2019. 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

(Figure 3)
Total Sheep and Goat Populations by District*

* Source: NASS Sheep and Goat, February 28, 2019
** Includes sheep and goats residing in the Navajo Nation.
Total RSSS Samples Collected by District

*As of August 31, 2019*

**District**

<table>
<thead>
<tr>
<th></th>
<th>Sheep</th>
<th></th>
<th>Goats</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Number of Animals**

* (Chart 6)
Total RSSS Samples Collected by State

FY 2019*

* As of August 31, 2019
Comparison by Month of RSSS Samples Collected in FY 2019* to Average of FY 2015 – FY 2018

* As of August 31, 2019.
Cumulative Number of Animals Sampled by Month

* FY 2019*

* RSSS and On-Farm as of August 31, 2019. (Chart 8)
RSSSS & On-Farm Surveillance Sampling by Species

FY 2019*

* As of August 31, 2019.

Slaughter:
- 79% Sheep
- 21% Goats
- 30,603 Total

On Farm:
- 59% Sheep
- 41% Goats
- 1,589 Total

(Chart 9)
RSSS and On-Farm Surveillance Testing by Species

**FY 2019**

**Goats**
- Dairy: [Bar Chart]
- Fiber: [Bar Chart]
- Meat: [Bar Chart]
- Multipurpose: [Bar Chart]
- Unknown: [Bar Chart]

**Sheep**
- Black Face: [Bar Chart]
- Mottled <1% Black: [Bar Chart]
- Mottled >1% Black: [Bar Chart]
- White Face: [Bar Chart]
- Other Sheep: [Bar Chart]
- Unknown Sheep: [Bar Chart]

*As of August 31, 2019.*
# RSSS and On-Farm Surveillance Testing by Species

**FY 2019***

<table>
<thead>
<tr>
<th>Species</th>
<th>Type</th>
<th>&lt; 2 Yrs</th>
<th>2 to &lt; 6 Yrs</th>
<th>6+ Yrs</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goats</td>
<td>Dairy</td>
<td>43</td>
<td>1,759</td>
<td>86</td>
<td>1,888</td>
</tr>
<tr>
<td></td>
<td>Fiber</td>
<td>2</td>
<td>9</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Meat</td>
<td>200</td>
<td>2,409</td>
<td>207</td>
<td>2,816</td>
</tr>
<tr>
<td></td>
<td>Multipurpose</td>
<td>112</td>
<td>1,858</td>
<td>102</td>
<td>2,072</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>10</td>
<td>308</td>
<td>20</td>
<td>338</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>367</td>
<td>6,343</td>
<td>417</td>
<td>7,127</td>
</tr>
<tr>
<td>Sheep</td>
<td>Black Face</td>
<td>706</td>
<td>6,931</td>
<td>2,344</td>
<td>9,981</td>
</tr>
<tr>
<td></td>
<td>Mottled &lt;1% Black</td>
<td>5</td>
<td>1,496</td>
<td>8</td>
<td>1,509</td>
</tr>
<tr>
<td></td>
<td>Mottled &gt;1% Black</td>
<td>181</td>
<td>2,774</td>
<td>63</td>
<td>3,018</td>
</tr>
<tr>
<td></td>
<td>White Face</td>
<td>267</td>
<td>8,071</td>
<td>158</td>
<td>8,496</td>
</tr>
<tr>
<td></td>
<td>Other Sheep</td>
<td>151</td>
<td>1,649</td>
<td>215</td>
<td>2,015</td>
</tr>
<tr>
<td></td>
<td>Unknown Sheep</td>
<td>1</td>
<td>44</td>
<td>1</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1,311</td>
<td>20,965</td>
<td>2,789</td>
<td>25,065</td>
</tr>
<tr>
<td>Grand Total</td>
<td></td>
<td>1,678</td>
<td>27,308</td>
<td>3,206</td>
<td>32,192</td>
</tr>
</tbody>
</table>

*As of August 31, 2019. Darker shading represents greater number of animals tested that met targeting criteria.*
FY 2019 Sheep and Goat State Sampling Minimums and State Collections - District 1

* As of August 31, 2019. Note that all surveillance samples may not yet have been credited to the State.
FY 2019 Sheep and Goat State Sampling Minimums and State Collections - District 2

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>666</td>
<td>360</td>
<td>346</td>
<td>30</td>
</tr>
<tr>
<td>Indiana</td>
<td>961</td>
<td>350</td>
<td>321</td>
<td>56</td>
</tr>
<tr>
<td>Iowa</td>
<td>1,249</td>
<td>589</td>
<td>184</td>
<td>412</td>
</tr>
<tr>
<td>Kentucky</td>
<td>379</td>
<td>310</td>
<td>199</td>
<td>74</td>
</tr>
<tr>
<td>Michigan</td>
<td>1,426</td>
<td>410</td>
<td>288</td>
<td>32</td>
</tr>
<tr>
<td>Minnesota</td>
<td>1,230</td>
<td>587</td>
<td>40</td>
<td>46</td>
</tr>
<tr>
<td>North Dakota</td>
<td>677</td>
<td>390</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Ohio</td>
<td>1,343</td>
<td>587</td>
<td>220</td>
<td>65</td>
</tr>
<tr>
<td>South Dakota</td>
<td>2,248</td>
<td>593</td>
<td>29</td>
<td>19</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>1,852</td>
<td>480</td>
<td>187</td>
<td>78</td>
</tr>
</tbody>
</table>

* As of August 31, 2019. Note that all surveillance samples may not yet have been credited to the State.
FY 2019 Sheep and Goat State Sampling Minimums and State Collections - District 3

*As of August 31, 2019. Note that all surveillance samples may not yet have been credited to the State.
FY 2019 Sheep and Goat State Sampling Minimums and State Collections - District 4

* As of August 31, 2019. Note that all surveillance samples may not yet have been credited to the State.
* As of August 31, 2019. Percentage of sampling minimum achieved is based on 92% of the annual sampling minimum.
As of August 31, 2019. Percentage of sampling minimum achieved is based on 92% of the annual sampling minimum. AK and RI have a sampling minimum of 1, and DE has a sampling minimum of 2.