National Scrapie Eradication Program

August 2020 Monthly Report
Fiscal Year 2020

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

September 15, 2020
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\textsuperscript{st} page of the Introduction

Please note the following:

- The links and action buttons only work when the presentation is viewed in slide show mode
- The links have greater reliability if only 1 monitor is in use
- 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.

Scrapie Testing Results\(^2\) – Nor98-like scrapie was confirmed in 2 sheep sampled at slaughter in May 2020 and August 2020. In October 2019, lymph node tissue collected from a lamb at slaughter had suspect staining on IHC. Genotype of the lamb was AA at codon 136 and RR at codon 171, which is considered to be resistant to classical scrapie. Additional testing, using three alternative antibodies to scrapie, produced mixed results. Due to the unusual staining, results for this animal were reported as ‘inconclusive’ for classical scrapie. Further testing was conducted on the flock which was depopulated for diagnostic purposes and all samples were not detected by IHC. This case has similar staining to an RR lamb tested in April 2018.

\(^1\)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, 2019 and August 31, 2020, and confirmed by September 15, 2020.
**Program Summary**

*Infected and Source Flocks* - There have been no infected herds identified in FY 2020. One flock in Texas has an open infected status since April 2016, but there are no exposed animals on the premises. Animals designated for test must be sampled and valid test results obtained before the status can be closed. The number of newly designated infected and source flocks by year since 1997 is shown in Chart 3. The peak was in 2005 with 180 flocks.

*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, 2020, there were 237 flocks participating in the Scrapie Free Flock Certification Program (SFCP). Statuses of these flocks were 41 export monitored, 41 export certified, and 155 select monitored flocks (Figure 2). SFCP open statuses by fiscal year of Status date from FY 2007 to FY 2020 are depicted in Chart 4.

3Chart 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 664,462 animals since April 1, 2003. As of August 31, 2020, 29,680 samples have been collected in FY 2020, 23,524 from sheep and 6,156 from goats. There have been 488 NVSL confirmed positive animals (473 classical cases – 470 sheep and 3 goats) and 16 Nor98-like cases since the beginning of RSSS. No animals have tested positive for classical scrapie in FY 2020.
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. In FY 2019, 2,103 sheep\(^4\) were genotyped through this pilot, and as of August 31, 2020, 2,840 have been genotyped in FY 2020. To date, no samples from genetically susceptible sheep referred for scrapie testing 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.

\(^4\)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, 2020, 784 sheep and 665 goats have been tested on-farm for FY 2020.

**Surveillance Goals**

The annual target is to test at least 40,000 animals each year for scrapie. As of August 31, 2020, 31,129 animals have been sampled for scrapie testing in FY 2020.

- 29,680 RSSS samples and 1,449 on-farm samples
- Of which 24,308 were sheep and 6,821 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.
* As of August 31, 2020. 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 2020*

* As of August 31, 2020. 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 2020*

*As of August 31, 2020*
Scrapie Cases in Goats
FY 2002 – FY 2020

(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 Flock Certification Program:

Participating Flocks and Herds*

* As of August 31, 2020

(Figure 2)
SFCP Participating Flocks Based on Status Date

**FY 2007 to FY 2020***

*As of August 31, 2020. 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.

(Chart 4)
Field Operations Districts

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


** Does not include sheep and goats residing on the Navajo Nation.
Total RSSS Samples Collected by District

**FY 2020***

<table>
<thead>
<tr>
<th>District</th>
<th>Sheep</th>
<th>Goats</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7,497</td>
<td>2,601</td>
</tr>
<tr>
<td>2</td>
<td>11,052</td>
<td>1,515</td>
</tr>
<tr>
<td>3</td>
<td>4,554</td>
<td>1,342</td>
</tr>
<tr>
<td>4</td>
<td>421</td>
<td>698</td>
</tr>
</tbody>
</table>

*As of August 31, 2020*
Total RSSS Samples Collected by State

FY 2020*

* As of August 31, 2020

(Figure 4)
Comparison by Month of RSSS Samples Collected in FY 2020* to Average of FY 2016 – FY 2019

Number of Animals Sampled during Current Fiscal Year (2020)

Average Number of Animals Sampled by Month based on Past Four Fiscal Years (2016-2019)

* As of August 31, 2020.

(Chart 7)
Cumulative Number of Animals Sampled by Month

FY 2020*

* As of August 31, 2020.

(Chart 8)
RSSS & On-Farm Surveillance Sampling by Species

FY 2020*

Slaughter

- 21% Goats
- 79% Sheep
- 29,680 Total

On Farm

- 46% Goats
- 54% Sheep
- 1,449 Total

* As of August 31, 2020.
RSSSS and On-Farm Surveillance Testing by Species

FY 2020*

<table>
<thead>
<tr>
<th>Species</th>
<th>Dairy</th>
<th>Fiber</th>
<th>Meat</th>
<th>Multipurpose</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goats</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheep</td>
<td>Black Face</td>
<td>Mottled &lt;1% Black</td>
<td>Mottled &gt;1% Black</td>
<td>White Face</td>
<td>Other Sheep</td>
</tr>
</tbody>
</table>

* As of August 31, 2020.
### RSSS and On-Farm Surveillance Testing by Species

**FY 2020**

<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>51</td>
<td>1,777</td>
<td>76</td>
<td>1,904</td>
</tr>
<tr>
<td></td>
<td>Fiber</td>
<td>1</td>
<td>32</td>
<td>3</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Meat</td>
<td>213</td>
<td>2,514</td>
<td>322</td>
<td>3,049</td>
</tr>
<tr>
<td></td>
<td>Multipurpose</td>
<td>84</td>
<td>1,299</td>
<td>155</td>
<td>1,538</td>
</tr>
<tr>
<td></td>
<td>Unknown</td>
<td>2</td>
<td>288</td>
<td>4</td>
<td>294</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>351</td>
<td>5,910</td>
<td>560</td>
<td>6,821</td>
</tr>
<tr>
<td>Sheep</td>
<td>Black Face</td>
<td>540</td>
<td>6,215</td>
<td>1,301</td>
<td>8,056</td>
</tr>
<tr>
<td></td>
<td>Mottled &lt;1% Black</td>
<td>3</td>
<td>1,107</td>
<td>66</td>
<td>1,176</td>
</tr>
<tr>
<td></td>
<td>Mottled &gt;1% Black</td>
<td>145</td>
<td>2,630</td>
<td>118</td>
<td>2,893</td>
</tr>
<tr>
<td></td>
<td>White Face</td>
<td>286</td>
<td>9,636</td>
<td>179</td>
<td>10,101</td>
</tr>
<tr>
<td></td>
<td>Other Sheep</td>
<td>193</td>
<td>1,677</td>
<td>186</td>
<td>2,056</td>
</tr>
<tr>
<td></td>
<td>Unknown Sheep</td>
<td>7</td>
<td>19</td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1,174</td>
<td>21,284</td>
<td>1,850</td>
<td>24,308</td>
</tr>
<tr>
<td>Grand Total</td>
<td></td>
<td>1,525</td>
<td>27,194</td>
<td>2,410</td>
<td>31,129</td>
</tr>
</tbody>
</table>

*As of August 31, 2020. Darker shading represents greater number of animals tested that met targeting criteria.*
FY 2020* Sheep and Goat State Sampling Minimums and State Collections - District 1

(Table 2)

* As of August 31, 2020. Note that all surveillance samples may not yet have been credited to the State.
### FY 2020* Sheep and Goat State Sampling Minimums and State Collections - District 2

* As of August 31, 2020. Note that all surveillance samples may not yet have been credited to the State.

<table>
<thead>
<tr>
<th>State</th>
<th>Sheep Total Sampled FY 2020</th>
<th>Sheep Sampling Minimum FY 2020</th>
<th>Goats Total Sampled FY 2020</th>
<th>Goats Sampling Minimum FY 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illinois</td>
<td>633</td>
<td>467</td>
<td>186</td>
<td>77</td>
</tr>
<tr>
<td>Indiana</td>
<td>912</td>
<td>533</td>
<td>152</td>
<td>102</td>
</tr>
<tr>
<td>Iowa</td>
<td>822</td>
<td>1,000</td>
<td>152</td>
<td>156</td>
</tr>
<tr>
<td>Kentucky</td>
<td>422</td>
<td>237</td>
<td>98</td>
<td>128</td>
</tr>
<tr>
<td>Michigan</td>
<td>1,192</td>
<td>484</td>
<td>169</td>
<td>65</td>
</tr>
<tr>
<td>Minnesota</td>
<td>1,226</td>
<td>474</td>
<td>131</td>
<td>86</td>
</tr>
<tr>
<td>North Dakota</td>
<td>712</td>
<td>231</td>
<td>20</td>
<td>11</td>
</tr>
<tr>
<td>Ohio</td>
<td>1,172</td>
<td>1,000</td>
<td>139</td>
<td>127</td>
</tr>
<tr>
<td>South Dakota</td>
<td>2,306</td>
<td>1,007</td>
<td>35</td>
<td>38</td>
</tr>
<tr>
<td>Wisconsin</td>
<td>1,248</td>
<td>516</td>
<td>198</td>
<td>209</td>
</tr>
</tbody>
</table>

(Table 3)
FY 2020* Sheep and Goat State Sampling Minimums and State Collections - District 3

* As of August 31, 2020. Note that all surveillance samples may not yet have been credited to the State.
FY 2020* Sheep and Goat State Sampling Minimums and State Collections - District 4

* As of August 31, 2020. Note that all surveillance samples may not yet have been credited to the State.
Percent of Sampling Minimum Achieved in FY 2020* - RSSS and On-farm Surveillance Sheep

* As of August 31, 2020. Percentage of sampling minimum achieved is based on 92% of the annual sampling minimum.

(Figure 6)

Percent of Sampling Minimum Achieved
- ≤ 20%
- > 20 - 40%
- > 40 - 60%
- > 60 - 80%
- > 80 - 100%
- > 100%
As of August 31, 2020. 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.