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Scrapie

Last Modified:

Scrapie is a fatal, degenerative disease that affects the central nervous system of sheep and goats. It is classified as a transmissible spongiform encephalopathy. Infected flocks typically experience significant production losses. The U.S. sheep and goat industry continues to experience export losses and increased production and disposal costs because the United States is not free of scrapie.

Scrapie is difficult to detect. It can take 2 to 5 years for an animal to show signs of disease, and current diagnostic tests require brain or lymphoid tissue. Animals typically live 1 to 6 months after they begin to show signs. Most are infected as young lambs or kids, but adult animals can get it, too. Apparently healthy animals infected with the disease agent can spread it.

What To Look For

- Signs of central nervous system problems, most commonly incoordination or poor muscle control (ataxia)
- Weakness of any kind, including stumbling, falling down, or having difficulty rising
    - *This does not include animals with visible traumatic injuries and no other signs of scrapie.*
- Behavioral abnormalities
- Significant weight loss with no decrease in appetite or in an animal with adequate teeth
- Increased sensitivity to noise and sudden movement
- Tremors
- Star gazing
- Head pressing
- Abnormal gait that involves both the forelimbs or rear legs such as high stepping with forelimbs, bunny-hop movement with rear legs, or swaying of back end
    - *This does not include gait abnormalities involving only one leg or one front and one back leg.*
- Repeated intense rubbing with:
    - Bare areas or damaged wool in similar locations on both sides of the animal's body or, if on the head, both sides of the poll
    - Abraded, rough, thickened, or hyperpigmented areas of skin in areas of wool/hair loss in similar locations on both sides of the animal's body or, if on the head, both sides of the poll

Less-specific clinical signs:

- Unable to walk prior to slaughter or death
- Condemned antemortem at slaughter for non-central nervous systems signs
- Poor body condition despite having good teeth
- Unknown cause of on-farm death

Videos

Clinical Signs of Scrapie
Difficulty Eating
Gait Problems
Nibbling
Hopping Gait

How To Prevent This Disease

One of the best ways to prevent scrapie is to select genetically resistant breeding stock. This practice has significantly reduced scrapie in the United States. Owners of infected flocks should restock with resistant rams and resistant or less susceptible ewes.

We also recommend the following biosecurity measures to reduce the spread of scrapie:

1. **Maintain a Closed Herd.** Maintain a closed herd with no external contact with sheep or goats. Minimize outside purchases of sheep or goats to reduce the risk of scrapie exposure. Select replacement animals from another closed herd that has measures in place to prevent scrapie introduction or that are genetically resistant.
2. **Reduce Exposure.** Wash and disinfect boots that have been to facilities with other livestock. After removing debris from surfaces, disinfect with a diluted 5.25% bleach solution (add 50 ounces bleach to 78 ounces of water to create 1 gallon of disinfection solution). Use personal protective equipment (PPE), such as boot covers and gloves, and proper handwashing techniques when traveling between livestock. Reduce commingling of herds in locations where livestock come from various places (such as markets, fairs, or exhibits).
3. **Confine Lambing and Kidding.** Confine ewes and does that are lambing or kidding so that there is limited contact with other animals. Remove any

placental tissues, fluids, and soiled debris as soon as possible after lambing/kidding while wearing PPE. Disinfect the birthing area between births. Ewes and does with unknown scrapie status should remain separated until there is no vaginal discharge. Milk and colostrum from potentially exposed sheep or goats should not be fed to lambs or kids.

How It Is Treated

There is no treatment for scrapie. To eliminate the disease from an infected flock or herd, genetically susceptible exposed animals and animals showing clinical signs are euthanized and the premises is cleaned and disinfected.

Prions are difficult to decontaminate as they have been shown to tightly bind to surfaces without losing infectivity. They are resistant to most disinfectants including alcohol and formalin. Prion contamination has also been shown to have resistance to heat and radiation. While prion decontamination is difficult, there are methods that can be used. For guidance on cleaning and disinfecting farm equipment and premises, see Appendix 2 in the Scrapie Program Standards Volume 2 (708.43 KB).

Report Signs of Animal Disease

Producers or owners who suspect an animal disease should contact their veterinarian to evaluate the animal or herd. Find an accredited veterinarian.

Animal health professionals (veterinarians; diagnostic laboratories; public health, zoo, or wildlife personnel; and others) report diagnosed or suspected cases of nationally listed reportable animal diseases to APHIS Area Veterinarians in Charge and to the State animal health official as applicable under State reporting regulations.

Eradicating Scrapie

Expand All

National Scrapie Eradication Program

Producers, accredited veterinarians, APHIS representatives, and State animal health employees may collect and submit samples from adult sheep or goats. APHIS provides shipping boxes and pre-printed, postage-paid labels at no cost to producers and accredited veterinarians. APHIS will pay for scrapie testing of up to 30 animals per flock per year. Producers may remove and submit whole heads (354.76 KB) or report deceased sheep or goats and ask for help with submitting samples. Accredited veterinarians can either remove and submit whole heads (354.76 KB) or collect and submit specified tissues (465.85 KB).The National Scrapie Eradication Program (NSEP), a cooperative State-Federal-industry program, is working to eradicate classical scrapie from the United States and meet World Organisation for Animal Health (WOAH) criteria for disease freedom. To date, the program has eliminated scrapie in 99 percent of U.S. sheep and goats. The program is conducting targeted sampling of subpopulations that have a higher prevalence of scrapie than the general sheep and goat population to find the remaining cases.

- NSEP Standards (1.46 MB)
- NSEP Quarterly Report (1.42 MB)

Modernizing NSEP

APHIS published a final rule (353.52 KB) in the Federal Register in 2019, updating scrapie program regulations (9 CFR 79). The rule established a more flexible approach to disease investigations and affected flock management and more consistent animal identification and recordkeeping requirements for sheep and goats. The rule also moved specific requirements for official eartags and official identification methods, such as tattoos and implantable electronic ID (microchips), and indemnity calculations to the NSEP Standards (1.46 MB).

Surveillance

The NSEP surveys for scrapie in the United States. Surveillance components include:

1. Regulatory scrapie slaughter surveillance
2. Non-slaughter surveillance (for example, trace investigations, on-farm testing)
3. The Scrapie-Free Flock Certification Program

Since 2002, the prevalence of scrapie has decreased significantly through existing eradication efforts. This is largely due to effective slaughter surveillance of geographically distributed sampling based on annual population estimates. However, to declare the United States “scrapie-free,” we must prove to the world that we have conducted testing in all sheep and goat populations. That is why owner submission of samples from sheep and goats over 18 months of age found dead or euthanized on farm is extremely important. With the help of those who raise sheep and goats, APHIS will be able to declare the United States free of scrapie. Scrapie currently costs sheep and goat industries approximately $10 to $20 million in lost export opportunities, annually.

- National Scrapie Surveillance Plan (424.27 KB)
- Scrapie Incentive Program (638.77 KB)
- FY 2027 State Sheep (241.32 KB) and Goat (214.97 KB) Sampling Minimums
- FY 2026 State Sheep (234.64 KB) and Goat (211.67 KB)Sampling Minimums

Indemnity

In 2021, APHIS started using a new indemnity process and published the Veterinary Services Indemnity Table (582.05 KB), which supersede section II.J. 4. (a) of the Program Standards that details how sheep and goat indemnity values are calculated.

Submitting Samples for Scrapie Testing

Producers, accredited veterinarians, APHIS representatives, and State animal health employees may collect and submit samples from adult sheep or goats. APHIS provides shipping boxes and pre-printed, postage-paid labels at no cost to producers and accredited veterinarians. APHIS will pay for scrapie testing of up to 30 animals per flock per year. Producers may remove and submit whole heads (354.76 KB) or report deceased sheep or goats and ask for help with submitting samples. Accredited veterinarians can either remove and submit whole heads (354.76 KB) or collect and submit specified tissues (465.85 KB).

To request a box, or for more guidance on collecting and submitting samples, contact the APHIS Area Veterinarian in Charge in your State or your State's

designated scrapie epidemiologist (DSE).

Shipping Instructions

Whole head samples
Ship the cooler containing the head with frozen cold packs overnight to Remington Locker, APHIS' sample collection facility:

18795 S 580 W
Remington, IN 47977
Phone: 317-347-3100
Fax: 219-261-2357
Email: remington.locker@usda.gov

Be sure to inform the facility of the shipment's delivery date.

Tissue samples
Ship tissue samples to an APHIS-contract laboratory.

Contact the APHIS Area Veterinarian in Charge in your State for Instructions

Test Results
Positive test results will be confirmed by the National Veterinary Services Laboratories (NVSL) or an NVSL-approved laboratory.

Designated Scrapie Epidemiologists

Use the dropdown menu below to look up DSEs and local points of contact (POCs) by State. You can also contact them for information on the National Scrapie Eradication Program or the Scrapie-Free Flock Certification Program.

- Select a State - ▼

Loading...
Scrapie Contacts

Genetic Susceptibility of U.S. Sheep and Goats

Approximately 30 percent of U.S. sheep are genetically susceptible to scrapie (15.91 KB). Some animals have been bred to be genetically resistant to the disease. Because scrapie persists in the environment for years, owners of previously infected flocks should restock with rams that are resistant and ewes of resistant or less susceptible genotypes.

All goat breeds are susceptible to scrapie. Three goat prion gene alleles have now been shown to confer meaningful resistance to classical scrapie. They are S146 or D146 (serine [S] or aspartate [D] amino acid at prion protein position 146), and K222 (lysine [K] at position 222). Goats bearing a single copy of one of these alleles are much less susceptible to infection during natural outbreaks as well as direct challenge experiments. It is believed that goats that are homozygous for these alleles may be highly resistant but there are so few of these goats that it hasn't been demonstrated. For regulatory purposed all exposed goats are currently treated as susceptible; however, APHIS may conduct genetic based pilot projects like what was done with sheep if infected goat herds with suitable genetics are found. Goat genetic susceptibility testing is now available at an approved laboratory.

Major Codons Associated With Scrapie in Sheep

Codon 171 is the major determinant of classical scrapie susceptibility in the United States. It plays a role in sheep susceptibility to the major type of classical scrapie found in the United States, valine-independent scrapie.

- It codes for the amino acids Glutamine (Q), Arginine (R), Histidine (H) or, rarely, Lysine (K).
- Q is associated with increased susceptibility to classical scrapie, while R is associated with increased resistance.
    - H is considered to have the same susceptibility as Q. The relative susceptibility of K is still under investigation. Therefore, both H and K are reported as Q by most laboratories and are treated as Q for regulatory purposes.
    - Over 99 percent of the classical scrapie cases in the United States that have been genotyped were QQ.

Codon 136 plays a role in sheep susceptibility to the less common type of classical scrapie found in the United States, valine-dependent scrapie.

- It codes for the amino acid Alanine (A), Valine (V) or, rarely, Threonine (T).
- V is associated with increased susceptibility to classical scrapie.
- The occurrence of T is extremely rare and as of September 2012 has never been reported in the United States. Because its role in susceptibility is unknown, if it were identified in U.S. sheep it would be reported by most laboratories as V and treated as V for regulatory purposes.

Codon 154 plays a minor role in classical scrapie and is not often used in the United States as part of a breeding or regulatory strategy. It is, however, associated with increased susceptibility to Nor98-like scrapie.

Codon 141 is associated with increased susceptibility to Nor98-like scrapie. Its role in classical scrapie, if any, is unknown.

Codon 112 also plays a minor role in classical scrapie, although its association with classical scrapie resistance is still under investigation.

Testing for Genetic Susceptibility

Genotype testing for susceptibility to scrapie is a key component of NSEP. *Note: Genetic testing does not tell you whether a sheep or goat is infected with scrapie.*

Sample submissions must meet the following requirements for official genotype testing:

- Sheep or goats are officially identified.
- The blood is drawn by a Federal or State animal health official or an accredited veterinarian.
- The sample is submitted with a VS Form 5-29 to an APHIS-approved goat or sheep genetic susceptibility testing laboratory.
- The sample meets any additional requirements set by the APHIS-approved lab.

Becoming an APHIS-Approved Genotyping Laboratory

Approved genotyping laboratories may conduct privately funded official scrapie genotype testing and compete for NSEP-funded official genotyping. This approval lasts for 1 year and is subject to review and renewal.

Each laboratory must apply to conduct official genotype tests. Interested labs should send an application package to the NVSL. The application must contain the following information about the laboratory:

- Laboratory name and address
- Name of the legally responsible official and, if different, the director of the laboratory
- A description of the laboratory facilities and equipment that will be used in performing genotype tests
- A list of the types of samples that will be tested
- The standard operating procedure for each test to be used, including methods, materials, equipment, and other relevant information
- A list of the names of individuals performing specific tests and a detailed statement of each individual's qualifications
- A detailed description of the procedures to satisfy the recordkeeping requirements of the Scrapie Eradication Program
- A description of the specific procedures for reporting test results
- The laboratory quality assurance manual
- A statement authorizing APHIS to inspect the laboratory without notice during normal business hours (inspection may include, but is not limited to, reviewing and copying records, observing tests being conducted, and interviewing personnel)

After submitting a complete application package, the laboratory will have additional tasks such as completing a proficiency test panel and site visits to demonstrate technical competency and evaluate testing and laboratory protocols. Following completion of these tasks, APHIS will extend approval in writing to the laboratory. For more information, contact scrapie@usda.gov.

Scrapie-Free Flock Certification Program

The National Scrapie-Free Flock Certification Program (SFCP) increases the marketability of sheep and goats from flocks that have demonstrated freedom of scrapie disease by adhering to program standards. This is a voluntary program for producers who are committed to monitoring their flocks for clinical scrapie signs and reporting any suspect animals for testing. Participants in this program benefit by decreasing the risk of introducing classical scrapie into their flocks.

Participants may participate in one of two categories in the SCFP program:

1. **Export Category—**Monitors and samples participating flocks. If conditions are met, it may lead to Export Certified status and recognition of negligible scrapie risk.
2. **Select Category—**Test samples from mature sheep and goats to identify and remove infected flocks.

Find SFCP participants in the United States

How To Apply

To participate in the SCFP program in either category, you must complete the SFCP application form (VS Form 5-22) (608.1 KB).

Note: The Export Category has additional documentation requirements for applying, such as a flock inventory and an initial flock inspection.

For more information on this voluntary program, including how to enroll, please contact scrapie@usda.gov.

Educational Materials

Title	Type	Description	Other Versions
Producers, Finish the Fight Against Scrapie (141.88 KB)	Poster	Information on how to provide samples for Scrapie testing	Not applicable

Title	Type	Description	Other Versions
Importing Ovine and Caprine Germplasm from Scrapie Affected Countries (5.52 MB)	Presentation	Information about how to import sheep and goat germplasm into the United States from countries known to have scrapie.	Not applicable
Animal ID and Recordkeeping for Sheep and Goats (PDF) (192.84 KB)	Factsheet	Overview of Federal regulations for animal identification and recordkeeping	Not applicable
Example Owner/Hauler Statement for Sheep and Goats (PDF) (165.17 KB)	Form/Template	Required documentation for sheep and goats moving through interstate commerce	Afrikaans (144.61 KB) Arabic (176.56 KB) Portuguese (141.01 KB) Spanish (143.2 KB) Turkish (207.62 KB)
Attention Sheep and Goat Owners! (PDF) (9.77 MB)	Poster	Summarizes key information about identification requirements and how to obtain scrapie tags	Afrikaans (16.29 MB) Arabic (16.4 MB) Farsi (16.42 MB) Portuguese (8.02 MB) Spanish (16.58 MB) Turkish (16.37 MB)

Title	Type	Description	Other Versions
Federal Sheep and Goat Official Identification Decision Tree for Animals in Interstate Commerce (PDF) (87.62 KB)	Decision Tree	Supplemental visual to help animal owners and others understand the Federal regulations for sheep and goat identification	Afrikaans (45.21 KB) Arabic (109.44 KB) Farsi (117.78 KB) Portuguese (73.75 KB) Spanish (73.17 KB) Turkish (68.01 KB)
Finish the Fight Against Scrapie (PDF) (625.76 KB)	Flyer	Outreach handout for slaughter facilities and producers about submitting scrapie samples	Arabic (1.23 MB) Chinese (316.94 KB) Farsi (1.23 MB) Hindi (871.47 KB) Portuguese (685.79 KB) Turkish (614.62 KB) Vietnamese (651.27 KB)
National Scrapie Eradication Program (NSEP) and the Importance of Sheep and Goat Traceability (YouTube)	Video	Summarizes the history of the NSEP and the Federal requirements	Not applicable

Title	Type	Description	Other Versions
National Scrapie Eradication Program Standards (PDF)	Final Rule	Cooperative procedures and standards adopted by APHIS and consistent States for eradicating classical scrapie from the United States	Not applicable
Sheep & Goat Official ID Basics (PDF) (82.85 KB)	Flowchart	Supplemental chart to help animal owners and others understand the Federal regulations for sheep and goat identification	Not applicable
What's New in Goat ID? (PDF) (4.5 MB)	Flyer	Outreach handout from the National Institute for Animal Agriculture (NIAA) that helps goat owners and others understand the Federal regulations	Low resolution for email (2.77 MB)
What's New in Sheep ID? (PDF) (1.92 MB)	Flyer	Outreach handout from the NIAA that helps sheep owners and others understand the Federal regulations	Low resolution for email (1.38 MB)
Scrapie Final Rule & Revised NSEP Standards: Key Things Market Operators Need To Know (Powerpoint) (5.09 MB)	Presentation	Powerpoint presentation that gives key points to livestock market owners and producers on Federal requirements	PDF (132.13 KB)
Sheep and Goat Identification Requirements (Powerpoint) (18.46 MB)	Presentation	Powerpoint presentation from the NIAA that gives details about the Federal rule for sheep and goat identification	PDF (48.54 MB)

Title	Type	Description	Other Versions
Official USDA Sheep and Goat Identification (PDF)	Report (1.13 MB)	Describes the quantity and number of orders for official identification distributed to or purchased by sheep and goat stakeholders from fiscal years 2008 to 2011	Not applicable

Contact Us

Area Veterinarians in Charge

Use the dropdown menu below to look up the APHIS Area Veterinarian in Charge in your State. They can give guidance on submitting samples for scrapie testing and related questions.

- Select a State - ▼

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Designated Scrapie Epidemiologists

Use the dropdown menu below to look up designated scrapie epidemiologists (DSEs) and local points of contact (POCs) by State. They can give guidance on submitting samples for scrapie testing and related questions.

- Select a State - ▼

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National Scrapie Eradication Program

Contact us for general questions about the National Scrapie Eradication Program, enrollment in the Scrapie-Free Flock Certification Program, or becoming an APHIS-approved genotyping laboratory.

National Scrapie Eradication Program

Email: scrapie@usda.gov

Scrapie Contacts
Print