

Scrapie Disease Information



This document was developed by the Oklahoma Department of Agriculture, Food, & Forestry (ODAFF) and the United States Department of Agriculture (USDA) to assist producers in their understanding of Scrapie and help producers protect their flocks from this devastating disease.

Disease Description

Scrapie is a fatal, degenerative disease affecting the central nervous system of sheep and goats. It is among a number of diseases classified as transmissible spongiform encephalopathies (TSE), all of which are thought to result from the accumulation of abnormal cellular “prion” proteins in the brain. Unlike bovine spongiform encephalopathy (BSE) or “Mad Cow Disease”, natural transmission of Scrapie to other species has not been shown. Susceptible animals are typically infected as young lambs through contact with the placenta or birth fluids from infected females. Although rams are susceptible to the disease, they are not known to transmit the infection. However, ram genetics will contribute to the susceptibility of their offspring. Incubation period for this disease is generally 2 to 5 years and is invariably fatal. Symptoms include behavioral changes, neurological abnormalities, weakness, incoordination, muscle and weight loss, lip smacking, and intense pruritus (itchiness). The name “Scrapie” was coined because infected animals will usually scrape their wool off from all the itching and rubbing. Death occurs within several weeks to months after onset of symptoms. Although the disease is more prevalent in black-faced sheep, all breeds are susceptible.

Disease Diagnosis vs. Genotyping

Antemortem diagnosis of Scrapie is from lymphoid tissue biopsy of the third eyelid or rectal mucosa, and postmortem diagnosis is from the obex of the brainstem. This test determines actual infection and is generally only used on Scrapie suspects, exposed animals, or for slaughter surveillance. Genotyping is a DNA test that identifies the genes that control Scrapie susceptibility or resistance. This test measures vulnerability and not infection. A few drops of whole blood collected on a FTA card is the sample used by most approved laboratories. Though there are multiple genes expressing different levels of susceptibility, codon 171 is the gene most focused on in the U.S. At this gene, “QQ” animals are highly susceptible to Scrapie infection if exposed, “QR” are rarely susceptible if exposed, and “RR” are highly resistant. So in essence, a 171 QQ fetus exposed to a Scrapie infected placenta will most likely result in infection of the newborn. Using this information, producers can select breeding stock that will spawn resistant offspring. For example, if a RR ram is bred to a QQ ewe, a QR lamb will be produced every breeding. This is the reason RR rams are desirable, because they can be bred to susceptible ewes and still produce offspring that is “rarely susceptible”. So essentially, disease vulnerability can be well addressed by ram selection alone without having to focus on the breeding females. There are many traits in sheep and goats that must be evaluated when determining breeding potential; genotype is another that can be added to that list. Genotyping can be performed by any accredited veterinarian, however, ODAFF and USDA cooperatively offer free genotyping services annually to eligible Oklahoma flocks. These programs increase disease surveillance in Oklahoma while providing a service to producers. Contact Dr. Justin Roach of ODAFF at 405-522-8396 or justin.roach@aq.ok.gov for more information regarding availability of free genotyping.

National Scrapie Eradication Program

TSEs are the subject of increased attention and concern because of the discovery of BSE in cattle and the link between it and variant Creutzfeldt-Jakob disease in humans. In addition to the significant production losses experienced by infected flocks, the presence of Scrapie in the U.S. has placed burdens and restrictions on the domestic and international markets for breeding stock, semen, embryos, meat, and bone meal. In all, Scrapie is estimated to cost the U.S. sheep industry over \$20 million annually. The combination of these factors led the USDA in 2001 to announce an accelerated program to eradicate Scrapie in the nation's sheep and goat flocks. The National Scrapie Eradication Program (NSEP), coordinated by USDA VS, is a joint effort that includes participation by state governments, industry, veterinarians, and particularly producers. This program is succeeding, and the prevalence of Scrapie has decreased by 80 percent since 2003. Producers can contribute significantly to this program by:

- Officially identifying sheep and goats per federal and state regulations.
 - In Oklahoma, sheep and goats of any age must be officially identified before being moved for show, slaughter, or change of ownership. If unsure whether a particular sheep or goat needs to be identified, **tag it**.
 - Official tags and applicator pliers are available free of charge from USDA (405-751-1701).
- Select for genetically resistant breeding stock using genotyping.
- Reporting suspect animals to the State Veterinarian's Office (405-ALL-STAR).

Biosecurity – Protect Your Flock

Scrapie is no different than any other livestock disease in that if proper biosecurity measures are followed, producers can limit the risk that their flock will be infected. There are several precautions producers can take to protect their flock from Scrapie, many of which will help limit the exposure to other diseases as well.

- Limit outside exposure. Limiting contact of non-farm personnel with livestock and livestock areas, washing hands and boots when visiting other livestock facilities or wearing plastic boots, and cleaning and disinfecting livestock trailers after hauling livestock from other farms. Fairs, sales, and exhibitions require special attention due to the number of animals commingling from across the country. Ewes and does that are in close proximity need to have special confinement to prevent contact with vaginal fluids.
- Lambing/kidding management. Remove placentas and bedding soiled by birth fluids from birthing areas right away and thoroughly clean the birthing area between lambings/kiddings.
- Flock/herd additions. Close the flock to female additions. The best way to maintain a healthy flock is to maintain a closed flock. Once the genetics of the flock has been established, replacement females should be selected from within the flock. Since Scrapie is transmitted primarily by females during lambing, keeping the disease out of the females is essential. If new additions are to be made, purchase ewes that have been genotyped and have the QR or RR genotype, or buy sheep from flocks that have reached the certified level of the National Scrapie Flock Certification Program. All new additions should be quarantined from the flock to observe for any signs of Scrapie before being commingled with the flock.
- Use genotyping to select genetically resistant breeding stock. Disease vulnerability of offspring can be well addressed by using RR rams alone without having to focus on the breeding females.

Other excellent sources of information regarding Scrapie and the NSEP include:

http://www.aphis.usda.gov/animal_health/animal_diseases/Scrapie/

<http://www.eradicateScrapie.org/>

http://sheepindustrynews.com/Scrapie_guide/