

# Scrapie



The Sleeping Killer

# Scrapie in Sheep and Goats

- First recognized as a disease of sheep in Great Britain/Western Europe
- Over 250 years ago
- Scrapie has been reported throughout the world
- In the United States, scrapie has primarily been reported in the black-face meat breeds and their crosses.

- It also has been diagnosed in numerous other breeds and crossbreeds including wool and hair sheep, and in goats
- Based on all goats sampled at slaughter through FY 2016, the prevalence of scrapie in U.S. cull goats is 0.002 percent with an upper limit of 0.004 percent

- The agent responsible for scrapie is smaller than the smallest known virus and has not been completely characterized.
- The most widely accepted theory is that the disease is caused by an infectious protein, or prion, that causes the normal cellular version of the protein to change shape
- The protein then can no longer be degraded by the cell, causing the protein to accumulate and damage the cell.

- The scrapie agent is extremely resistant to heat and to normal sterilization processes
- The scrapie agent is thought to be spread most commonly from the ewe to her offspring and to other lambs through contact with the placenta and placental fluids and through milk and colostrum
- Signs or effects of the disease usually appear 2 to 5 years after the animal is infected but may take longer
- Sheep usually live 1 to 6 months after the onset of clinical signs ... death is inevitable.

# Cousin Mad Cow

- According to Aphis, Scrapie is closely related to Bovine spongiform encephalopathy (BSE)
- Commonly known as mad cow disease, is a transmissible spongiform encephalopathy and fatal neurodegenerative disease in cattle
- Unlike scrapie, may be passed to humans who have eaten infected flesh.

- BSE causes a spongiform degeneration of the brain and spinal cord
- BSE has a long incubation period of 2.5 to 5 years, usually affecting adult cattle at a peak age onset of four to five years.
- BSE is caused by a misfolded protein—a prion
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- In the UK more than 180,000 cattle were infected and 4.4 million slaughtered during the eradication program.

# Scrapie Signs

- Signs of scrapie vary widely among individual animals
- Develop very slowly
- Affected animals usually show behavioral changes
- Incoordination, which progresses to recumbency and death.



- May be followed by scratching and rubbing against fixed objects to relieve itching
- Loss of coordination, weight loss biting of feet and limbs, lip smacking
- Gait abnormalities, including high-stepping of the forelegs, hopping like a rabbit, and swaying of the back end.



# Testing

- Immunohistochemistry – Official test.
- Histopathology is used to identify pathological changes in the brain following necropsy.
- Pathological changes of scrapie are confined to the central nervous system or spongy alteration called status spongiosis

# APHIS APPROVED TESTING

- Third-eyelid and rectal lymphoid tissue biopsy in live animals
- Biopsy of lymphoid tissue from the third eyelid or rectum
- Rectal biopsies are preferred
- Easier to collect rectal biopsies

# Reduce Spreading

- Removal of genetically susceptible exposed animals
- Live-animal testing and removal of test-positive animals
- Breeding for genetic resistance
- Careful cleaning and disinfection of birthing facilities
- Improved management
- Removing and burying, landfilling or incinerating birthing materials
- When warranted by extremely valuable stock, employing embryo transfer, cesarean section, or both.

# The National Scrapie Eradication Program

- Two major components
- Regulatory eradication program called the Accelerated Scrapie Eradication Program (ASEP)
- Voluntary certification program called the Scrapie Flock Certification Program (SFCP).

# Eradicate!

- Slaughter surveillance, reporting of suspect animals by producers and accredited veterinarians
- Testing of mature animals that die on farm or at other locations, and live-animal testing of higher risk animals
- Tracing of infected animals to their flock or herd of origin and tracing and testing of exposed animals made possible as a result of the new identification requirements
- Providing effective cleanup strategies that will allow producers to stay in business, preserve breeding stock, and remain economically viable.

# APHIS Provides Assistance

- Owners of exposed and infected flocks or herds that participate in cleanup plans  
Indemnity for high-risk, suspect, and scrapie-positive sheep and exposed goats that owners agree to destroy;
- Genetic testing of sheep for scrapie susceptibility; and
- Scrapie testing on live or dead animals

# Scrapie Flock Certification Program (SFCP)

- The SFCP is a voluntary program that is open to all sheep and goat producers in the United States
- The objective of the SFCP is to minimize the scrapie risk of participating flocks and herds
- Improving the marketability of animals from participating flocks and herds and contributing to the national scrapie eradication program



# Conclusion

- Producers appear to have made progress
- Cases are rarely reported in 2018
- Hopefully Scrapie will be totally eradicated in the near future

# References

- **APHIS**

<https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/nvap/NVAP-Reference-Guide/Control-and-Eradication/Scrapie>

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- **WIKIPEDIA** <https://en.wikipedia.org/wiki/Scrapie>

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