

Scrapie Eradication Strategic Plan Delivery

Canada 



Growing Forward 2 

A federal-provincial-territorial initiative

What is Scrapie?

- ▶ Scrapie is a fatal disease that affects the central nervous system of sheep and goats.
- ▶ It is a transmissible spongiform encephalopathy (TSE), or 'prion disease' in the same classification as BSE in cattle and bison, CWD in cervids and Creutzfeldt-Jakob disease in people.
- ▶ Scrapie is associated with the presence of an abnormal form of protein call a prion, that causes other proteins to misfold. These misfolded prions then accumulate in the CNS ultimately causing the death of the animal.
- ▶ Classical scrapie is transmissible from one animal to another where atypical scrapie has a different epidemiology and occurs spontaneously. When we refer to scrapie control in Canada, we are referring to classical scrapie.

The impact of scrapie on producers.

- ✓ Scrapie is a federally reportable disease, subject to disease control measures including:
 - ✓ Farm quarantines,
 - ✓ Possible blood tests of all sheep,
 - ✓ Destruction of all susceptible and at-risk animals,
 - ✓ Clean up and disinfection protocols.
- ✓ Between 2008 and 2013:
 - ✓ 4,075 animals, worth \$3.4-\$4.9 million, ordered destroyed,
 - ✓ Additional 6,425 animals under 12 months of age ordered slaughtered.
- ✓ Between 2013 and today:
 - ✓ 1,800 sheep and 900 goats, worth \$2.5-\$2.7M, ordered destroyed,
 - ✓ Additional 3,000 sheep under 12 months of age ordered slaughtered.

Scrapie Prevalence in Canada

- 12522 samples collected November 2010 through December 2012
- Sheep: 0.08% or 1 in every 1,300 adult animals
- Goats: 0.26% or 1 in every 383 adult animals

Project Objectives

- ▶ Eradicate classical scrapie from the national sheep flock and goat herd
- ▶ Mitigate economic losses to producers
- ▶ Reduce the cost of disease control actions to Canadian sheep and goat industries
- ▶ Regain market access lost as a result of the BSE crisis of 2003

Targeted Scrapie Surveillance Plan

- ▶ Scrapie surveillance strategy based on the Canadian National Scrapie Prevalence Study
- ▶ Surveillance consists of samples from federally inspected abattoirs, provincial abattoirs, and voluntary on-farm sample submissions
- ▶ Promotion of voluntary submission of scrapie samples from on-farm deaths
- ▶ Objectives:
 - Increase sample collection from under-sampled geographic areas
 - Increase samples collected from national goat herd population
 - Create a registry of Canadian sheep and goat producers who have contributed to on-farm surveillance

Voluntary Scrapie Flock Certification Program Expansion

- ▶ Promoting the VSFCP as a valuable tool for flock and herd health
- ▶ Promoting the Voluntary Scrapie Flock Certification Program (VSFCP) as interim market access tool
- ▶ Scrapie Working Group and CFIA will explore the option of creating an additional VSFCP pathway:
 - Simplified program requirements that demand less of producers' time and resources
 - Increase total number of VSFCP enrolled producers, thereby increasing total volume of voluntary on-farm sample submissions
 - No market access function, promoted for disease control benefits

VSFCP Design

- Designed to assess if a herd has scrapie and minimize the risk of contracting scrapie in the future;
- Available to any sheep/goat producer in Canada;
- The program's National Standards are maintained by the CFIA, and the VSFCP is endorsed by the CFIA.
- Once 'Certified' animals are considered negligible risk for scrapie;
- Three program pillars:
 - Limited acquisitions
 - On-farm surveillance
 - Inventory control

Benefits of Enrollment

- ▶ VSFCP is an effective and recognized disease control program.
- ▶ With each year of compliance, producers are at lower risk for developing scrapie.
- ▶ Increased surveillance will help move the entire nation to ‘negligible risk’ status.
- ▶ Implicated in existing import policy
- ▶ Requirement for some export programs (Mexico, USA)

Scrapie Resistance Genetics

- ▶ A sheep's genes (genetic makeup) consist of stretches of folded proteins.
- ▶ If a protein misfolds, it becomes an infectious prion that can trigger the misfolding of many proteins.
- ▶ Misfolded proteins build up in the brain and neural tissue, killing brain cells and causing the neuro-degenerative disease that is scrapie.
- ▶ The presence of certain amino acids at specific codons influences resistance or susceptibility to protein misfolding.
- ▶ Resistance to scrapie associated with 3 codons
 - ▶ 136, 154 and 171
- ▶ In North America, resistance influenced more by the coding at 136 and 171
- ▶ 'R' (arginine) at 171 increases resistance, 'Q' (glutamine) increases susceptibility

Genotype (codon 136 codon 171)	Genotype (Allele 1/ Allele 2)	Susceptibility to Classical Scrapie
AA RR	ARR/ARR	negligible
AA QR	ARQ/ARR	very low
AV QR	VRQ/ARR	intermediate
AA QQ AV QQ VV QQ	ARQ/ARQ ARQ/VRQ VRQ/VRQ	high

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