TSEs & Canadian Sheep and Goats

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Overview

- Scrapie/BSE – Where are we at?
- Scrapie Surveillance in North America
- What if there is a positive Scrapie on your farm?
- Scrapie genetics – how does it work?
- Voluntary Scrapie Flock Certification Program
- Export
- Questions
Scrapie – Where are we at?

- CFIA put out a “Notice to Industry” in November 2008 (handout)

- The intent is to collect samples from dead sheep and goats greater than 12 months of age that exhibit:
  1) Weight loss
  2) Problems standing or walking
  3) Changes in behavior
Scrapie - Canada

- Reported first case of Scrapie 1938
  - Introduction of disease associated with sheep imported from UK
- Continued presence of disease
  - Prevalence unknown
TSEs (Transmissable Spongiform Encephalopathies)

- Which TSEs are we talking about
  - Scrapie
  - BSE
BSE - Canada

- Importations from European countries during the 1980s
- Presence of BSE agent confirmed in Canada
  - What potential was there for domestic exposure of sheep / goats
- CFIA
  - Differential testing of some scrapie positives
  - The concern is the detection of BSE in Scrapie positives
BSE/Scrapie – Why more testing?

- Two cases of BSE in goats reported (France)
- These BSE cases are creating interest in Scrapie becoming a potential human health issue
- Scrapie is a reportable disease,
- USDA wants more samples from Canada,
- USDA has an established Scrapie surveillance program already – Canadian equivalence,
- Continued open border to sheep and goats > 12 mo. of age,
Scrapie Surveillance in Canada

- Slaughter samples are being taken across Canada (goal of 4000 per year);
- Manitoba`s share is 40 or more; (this is based on sheep/goat numbers)
- Over the last twelve months we have tested 63 (these are also on farm submissions)
<table>
<thead>
<tr>
<th>Canada</th>
<th>U.S.</th>
</tr>
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<tbody>
<tr>
<td><strong>Identification</strong></td>
<td><strong>Identification</strong></td>
</tr>
<tr>
<td>• national</td>
<td>• interstate only</td>
</tr>
<tr>
<td>• sheep</td>
<td>• sheep and goats</td>
</tr>
<tr>
<td><strong>Infected premises</strong></td>
<td><strong>Infected premises</strong></td>
</tr>
<tr>
<td>• national program</td>
<td>• minimum national standards for State programs</td>
</tr>
<tr>
<td>• indemnification</td>
<td>• indemnification</td>
</tr>
<tr>
<td><strong>Scrapie flock certification program</strong></td>
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</tr>
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<td>• national standards</td>
<td>• national standards</td>
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<tr>
<td>• several pathways</td>
<td>• only 1 pathway</td>
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<td>• deadstock surveillance</td>
<td>• no deadstock surveillance</td>
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<td>• only 1 flock currently enrolled</td>
<td>• has been enrolling flocks for many years (several thousand)</td>
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<td><strong>Surveillance</strong></td>
<td><strong>Surveillance</strong></td>
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<td>• Post flock clean-up</td>
<td>• abattoir (25,000 in 2004)</td>
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<td>• sfcp (limited)</td>
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Scrapie demographics

- 1.3 M sheep in Canada;
- Prevalence of Scrapie unknown;
- Voluntary Scrapie Flock Certification Program;
- Disease Control/Eradication by CFIA;
- Producer/industry driven program;
Scrapie Testing by CFIA

Any DEAD sheep/goat: CFIA will come out and collect sample of brain stem;

- Any LIVE sheep/goat with clinical signs suggesting Scrapie, CFIA will come out:
  - Downer/non-ambulatory: Compensation
  - Poor doer/ambulatory: Compensation
Surveillance – 4Ds

- 4Ds = highest risk population
  - Diseased
  - Down
  - Dying
  - Dead

- Moribund animals are representative of the 4 Ds
- Similar to the widely publicized BSE criteria
What is CFIA looking at also?

- Differentials for Scrapie when looking at animals on farm:
  1) Ectoparasites (lice, mites)
  2) Hypomagnesaemia
  3) Ovine Ketosis
  4) Rabies
  5) Listeria
  6) Maedi – Visna
  7) Pseudorabies
  8) Sarcosystosis
  9) Starvation
  10) Old Age
What if there is a POSITIVE Scrapie on your farm?

CFIA gets involved in helping you make a decision...
Infected Premises

- Infected premises
- Choice
- Depopulation
- Genotype
Scrapie genetics – how does it work?

- Flex your brain muscles
- Read…www.scrapiecanada.ca
- And/or …. www.inspection.gc.ca
Genetics of Scrapie in Sheep

- Differently resistant to the infection based on genetics,
- Presence of certain amino acids on the prion protein results in greater or lesser susceptibility to Scrapie,
- If the prion protein undergoes structural change it causes the disease, by migrating into the reproductive tract of pregnant females,
- At lambing/kidding the Scrapie agent is free to spread (birthing fluids, placenta etc.),
- These amino acids are abbreviated and located at a numeric spot (codon) on the gene (one of 256), Glutamine: Q; Alanine: A; Valine(V,R) depending on location on the gene,
Which sheep is more likely to get sick?

- Genotype determines this - looking at two locations on the gene (136 and 171) of total of 256 spots (codon),
- NorthAmerican variety of Scrapie
Susceptibility

- Susceptibility
  136/171
  AAQQ
  AVQQ
  VVQQ

- Genotype (136,171)
  HIGH
Susceptibility

- Genotype
- Susceptibility

- AVQR
- Medium
Susceptibility

- Genotype
- Susceptibility

- AAQR
- Very Low
Susceptibility

- Genotype
- Susceptibility

- AARR
- Negligible
100 head flock example
How many QQ`s?

- E.g.: 100 head flock - you have 34 QQ`s:
  - Now, we know: 34 VERY susceptible animals.
  - Those are now screened for Scrapie using a test called “third eyelid test”- tissue sample.
  - If those are negative, good news;
  - Presumably you don`t have active Scrapie infection;
  - If some/all those are positive, we slaughter and test the next susceptible bunch: AVQR;
How many AVQR?

- We had 34 QQ`s and 16 AVQR`s
- These are third eyelid tested.
- If all/some are positive, we slaughter;
- If negative, good news;
- Therefore, if we get to stop here, we tested 50 animals with the third eyelid test.
Triage Using Genetics

bleed
genotype

QQs

AVQR

AAQR

RR
Clear as Mud?

Us CFIA guys will worry about the details
<12m breeding stock

If you would like to keep select breeding stock replacement – can genotype at own cost

genotype
Potential Source Flocks

Infected premises
Voluntary Scrapie Certification Program

- More on the websites
  www.scrapiecanada.ca and
  www.inspection.gc.ca
Voluntary Scrapie Flock Certification Program (SFCP)

- Producer can elect to get involved;
- Accredited Private Veterinarian administers;

Three pathways:

- Pathway 1: For goats: dead stock surveillance only;
- Pathway 2: Sheep only: Third eyelid testing of QQ`s in addition to dead stock testing;
- Pathway 3: Sheep only: QQ`s are removed in addition to dead stock testing;
Administration of SFCP Program

- **CFIA**
  - **National Standards**
    - develop rules
    - export certification
    - international acceptance

- **OSMA**
  - **Regional Administrator**
    - application
    - statistics

- **Private Veterinarian**

- **Accredited by CFIA**

- **Delivery**
  - oversight on farm
  - 1st level audit

- **Testing**
  - laboratories
Suspect

Clinical suspect → destroy → test

Differential Diagnosis

1
2
3

Quarantine observe

Genotype
Surveillance – Mature Deadstock

- **Post disease control actions**
  - 50+ flocks under surveillance 2003 (647)
  - only 5 flocks currently under surveillance (171)

- **Flock certification program**
  - Mature deadstock surveillance
Export

- To the USA.
US – What was to be allowed

- Sheep and goats <12 months of age:
  - Direct to slaughter
  - To registered feedlots
- Must be identified
  - CSIP tag
  - Hot or freeze brand “c” on right hip
  - Sealed conveyance
  - Documents..............
Contact information for CFIA offices across Manitoba

- Biossevain (204) 534-6288
- Brandon (204) 726-7556
- Carman (204) 745-2292
- Dauphin (204) 638-3322
- Portage la Prairie (204) 239-8420
- Steinbach (204) 326-8331
- Winnipeg (204) 983-2219
Questions