BSE Update
Meat Industry Perspective

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Overview

- BSE and how it spreads
- Control measures for BSE
- Safety of North American beef
What is BSE?

**Bovine Spongiform Encephalopathy**

- Family of Transmissible Spongiform Encephalopathy (TSE) diseases
- Fatal neurological disease of cattle
- Believed to be caused by misshapen prions
- BSE first identified in 1986 in England
- Linked to variant CJD in humans in 1996
The Global Spread of BSE

- 1986
- 1989
- 1991
- 1994
- 1997
- 2000
- 2001
- 2002
- 2003

- Canada
- USA
- Japan
- Israel
Variant Creutzfeld-Jakob (vCJD) first described

Epidemic Peak

Feed ban implemented

First BSE case confirmed by histopathology

Variant Creutzfeld-Jakob (vCJD) first described

Lag time for initial feed ban effect

Compliance challenges and Incubation variability

Silent phase

Investigation and Analysis

Lessons from the UK BSE epidemic curve

Feed ban introduced

First histopathological confirmation
Worldwide Cases of BSE and vCJD

Year of onset

BSE

vCJD

Worldwide Cases of BSE and vCJD
Scientific Principles of BSE Prevention

- Cattle Feed
- Cattle
- Beef Processing

Block recycling of rendered ruminant proteins into cattle feed
Exclude affected tissues and minimize cross-contamination

Consumer
Control Measures for BSE
USDA BSE Firewalls

*Before December 2003*

- Ban on imports from countries that have had a case of BSE
- Surveillance testing of high risk cattle
- FDA feed ban on feeding mammalian proteins to cattle
U.S. BSE Prevention Strategies

Only one single cow of Canadian origin has tested positive for BSE in the United States. This is in sharp contrast to Europe, which has diagnosed more than 180,000 since 1986. The graphic below details the firewalls required by the U.S. government and implemented by the feed, rendering, cattle and meat industries to protect cattle herds and to keep U.S. beef safe.

Federal government inspects borders. No ruminant animals* like cattle or sheep or from countries with BSE are currently allowed to enter the U.S. Only food products that have been shown to be safe and do not harbor the infective agent may be imported.

In 1997, FDA banned the use of ruminant proteins in feed for cattle and other ruminants. That ban was extended in 2004 to include blood products, “plate waste” and poultry litter.

Industry certification/affidavits help ensure compliance with the ban.

Producers require feed companies to certify that feed is produced in compliance with federal law, which requires that ruminant protein is not fed back to cattle and other ruminants.

Packers require producers to certify that animals are fed in compliance with FDA feed rules.

USDA veterinarians inspect all animals destined for slaughter. Non-ambulatory cattle do not enter the food chain. Government mandates that animals tested for BSE must be held pending test results. Specified risk materials are required to be removed from the food chain.

USDA conducts surveillance programs to detect BSE.

In U.S. BORDERS, FDA requires dedicated facilities or processing lines. Mills manufacturing feed for ruminants cannot handle any ruminant derived protein.

In FEED MILLS, FDA inspectors check mills for compliance, which is now at 99% compliance.

In FARM/FEEDLOTS, rendered ruminant protein is sent to feed mills for inclusion in non-ruminant feed formulations.

In PACKING PLANTS, FDA requires renderers to separate ruminant and non-ruminant proteins in rendering facilities.

In RENDERING FACILITIES, industry created third-party certification program to complement the FDA feed rule and to ensure industry-wide compliance.

Rendering plants process raw material from packing plants and other sources.

* A ruminant animal has four stomachs and includes cattle, sheep, goats, deer and elk.

April 2004
Strengthened USDA BSE Regulations
(Implemented on January 12, 2004)

- Ban non-ambulatory cattle
- Ban SRM’s from cattle over 30 months
- Ban small intestine and tonsil from all cattle
- Ban air-injected stunning
- Test and hold policy required for all cattle tested for BSE
- Additional control on Advanced Meat recovery
# BSE Precautionary Procedures

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<th>Pre Harvest</th>
<th>Pre Slaughter</th>
<th>Beef Slaughter</th>
<th>Carcass Chilling</th>
<th>Carcass Disassembly</th>
<th>Rendering</th>
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<td><strong>Downer purchase policy</strong></td>
<td><strong>No air injection stunning</strong></td>
<td><strong>Carcass Segregation [30 mo. of age and older]</strong></td>
<td><strong>Carcass Segregation [30 Months of Age and Older]</strong></td>
<td><strong>Feed prohibition</strong></td>
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<td><strong>Feed Affidavit</strong></td>
<td><strong>Ante-mortem inspection</strong></td>
<td><strong>Dentition Age Segregation [30 mo. of age and older]</strong></td>
<td><strong>SRM control program – tonsils, brain, spinal cord, skull and Ileum removal</strong></td>
<td><strong>SRM Control Program</strong></td>
<td><strong>Labeling</strong></td>
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<td><strong>Feedlot Review</strong></td>
<td><strong>Non-ambulatory policy</strong></td>
<td><strong>AMR Control Program</strong></td>
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<td><strong>Vertebral Column Removal</strong></td>
<td><strong>Segregation of edible and inedible Rendered sales designation</strong></td>
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<td><strong>AMR Control Program</strong></td>
<td><strong>Rail car clean-out procedure</strong></td>
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</table>
Live Animal Receiving Program

Ante-Mortem Rejected [USDA Condemned] ➔ Off-Site Disposal

Non-Ambulatory [USDA Condemned] ➔ Rejected to Off-Site Disposal

CNS Suspect USDA Condemned ➔ disposed of by incineration or Landfill

Dead-On-Arrival [From Non-Ante-Mortem Passed Stock] ➔ Rejected to Off-Site Disposal

Ambulatory and USDA Ante-Mortem Passed
Marking for Removal of SRM’s
Age Segregation & ‘Mature’ Carcass Identification
SRM Removal – Slaughter

- **Cattle 30 Months of Age and Older**
  - Spinal Cord – Inedible Rendering
  - Brain – Inedible Rendering
  - Skull – Inedible Rendering
  - Eyes – Inedible Rendering

- **All Carcasses Regardless of Age**
  - Tonsils – Inedible Rendering
  - Distal Ileum – Inedible Rendering
SRM Removal and Control - Carcass Disassembly

Removal of Vertebral Column [DRG]

Vertebral Column [DRG] is removed from Carcasses 30 months of age and older and sent to inedible rendering.

Washing / Sanitizing of Affected Equipment after >30 month old.
Current Science on Safety of Beef Muscle
Beef Safety

- Beef is safe, even from countries with many cases of BSE in cattle herd
- Specific tissues (SRM) are the only source of potential contamination.
- SRM are only contaminated if the animal has the disease.
- Harvard Study clearly demonstrates that U.S. herd is very resistant to disease
Tissue Infectivity by Age

- Spinal Cord
- Dorsal Root Ganglia
- Brain
- Retina
- 3rd Eyelid
- Trigeminal ganglia
- Tonsils
- Distal Ileum

Over 30 Months of Age

Under 30 Months of Age
USDA Specified Risk Material Ban Protects Beef Safety

- No evidence to date of BSE agent in beef muscle
- No BSE agent detected in bone marrow, buffy coat, serum, blood clot, lymph node, fetal calf serum, spleen from clinical BSE cases.
Surveillance Testing

- Requires a sample from the obex of the brain stem
- Detectable with the laboratory assay only 3 – 6 months prior to clinical signs of disease
- Bioassay remains the most sensitive test method
- Histopathology is used in surveillance systems worldwide and the U.S.
- Rapid screening methods are now approved and being used by USDA
APHIS Surveillance
(one-time program for 12–18 months)

- Total adult cattle population 45 million
- At risk cattle population -- 446,000
- APHIS will sample as many of these from the at risk population as possible
  - IF 201,000 sampled, 95% confidence that the program will detect the disease if it exists at 1 case/10,000,000
  - IF 268,000 sampled, 99% confidence that the program will detect the disease if it exists at 1 case/10,000,000
- Additional 20,000 healthy adult cattle will be sampled
Science of BSE testing

Average incubation = 60 mo
Youngest UK case 2002 = 51 mo

Potential BSE Exposure

Clinical Onset Of BSE

BSE test kits only detect disease about 6 months prior to clinical onset

80% harvested < 30 mos

Birth 6 12 24 30 36 44 50 60

Months of Age
### Tracking youngest cases in UK epidemic

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<th>Year Onset</th>
<th>86</th>
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Increasing minimum age suggest smaller exposure
Summary

- USDA has had aggressive, scientifically sound BSE control measures in place for many years.
- USDA has strengthened regulations.
- Beef is safe.
- Consumer confidence in the safety of beef remains high.
How about letting them have our cup, but only if they let some beef in?