

**MEETING OF THE STATES PARTIES TO THE
CONVENTION ON THE PROHIBITION OF
THE DEVELOPMENT, PRODUCTION AND
STOCKPILING OF BACTERIOLOGICAL
(BIOLOGICAL) AND TOXIN WEAPONS AND
ON THEIR DESTRUCTION**

BWC/MSP/2004/MX/WP.79
30 July 2004

ENGLISH ONLY

Second Meeting
Geneva, 6-10 December 2004

Meeting of Experts
Geneva, 19-30 July 2004
Items 5 and 6 of the agenda

Impacts of the BSE Incident in Canada¹

Submitted by Canada

1. In May 2003, Canada found evidence of its first native case of Bovine Spongiform Encephalopathy (BSE). This resulted from tests that had been performed on a cow first identified as a suspect BSE case in late-January 2003. Following positive identification of the disease and alerts to the OIE by the Minister of Agriculture, Canada undertook an extensive epidemiological investigation to ascertain the origin of the outbreak as well as to determine whether there were other possibly infected animals associated with this case. Extensive tracebacks and testing led to the destruction of some 2700 suspect cattle, all of whom later tested negative upon further examination. The origin of the case was eventually determined to be infected Meat and Bone Meal prepared from an animal imported from the UK in the 1980s. This meal was eaten by the index case prior to the feed ban put in place in Canada in 1997.

2. Despite the fact that this outbreak represented only one animal out of a total population of millions, nevertheless it was devastating for Canada's beef and cattle industry, which has lost billions of dollars in exports. A lesson to be drawn is that it only takes a relatively minor incident to create economic havoc, thus underscoring the potential vulnerability of agriculture to terrorism and future outbreaks of disease.

3. Attached is a summary of information taken from the Canadian presentation on BSE on July 27, 2004. The full presentation is available upon request.

¹ Prepared by the Canadian Food Inspection Agency.

Annex

Information from the BSE Presentation

Presentation Overview

- BSE Backgrounder
- The Story So Far
- First native case in May 2003
 - Investigation
 - Safety Controls
 - Origin of Infection
- Epidemiological Factors
- Conclusions

What is BSE

- Transmissible Spongiform Encephalopathy
- Cause = ?????
 - small virus
 - prion
 - weird virus
- Spread—Ingestion

What is BSE

- Other Prion Diseases – Relatives?
 - Scrapie
 - Transmissible mink encephalopathy
 - Feline spongiform encephalopathy
 - Chronic Wasting Disease
 - Kuru
 - Cruetfeld Jakob
 - Gerstmann-Straussler syndrome
 - Fatal Fetal Insomnia
 - Variant Cruetfeld Jakob

What Does BSE Look Like

- Signs:
 - slow progress
 - degenerative nervous disorder
 - death

BSE Background

- First Described in the UK in 1986 (more than 180,000 cases in UK cattle to date).
- BSE present in most countries of Western Europe.
- Peak of the epidemic in UK 1992-1993.
- Surveillance in Canada began in 1992.
- BSE detected in Alberta in 1993 (in one animal imported from UK).
- BSE recently found in Japan, Israel, Slovakia, Czech Rep, and Poland.

The Story So Far

- Canada has imported no meat and bone meal from BSE affected countries for decades.
- 1989 suspension of live animal imports from UK.
- 1990 BSE made notifiable disease in Canada:
 - tracing and monitoring program of imports.
- 1992 surveillance program established.
- 1993 detection of a case in an imported animal.

The Story So Far

- 1994 removal of remaining imported cattle.
- 1997 feed ban in excess of WHO recommendations.
- Hemispheric approach with U.S. and Mexico.
- 2003 detection of indigenous case.

Overview of Case

- Occurrence had its origins 21 years ago.
- Consequences have been minimized by collective of successive risk based decisions.
- Impacts at many levels:
 - producer
 - processor and agri-business
 - animal and public health community
 - consumer
 - international

The Investigation into the May 2003 Detection of BSE in Canada: The Index Case

- **January 31, 2003:**

- a cow in Northern Alberta identified at an inspected abattoir as a downer.
- condemned due to pneumonia.
- qualified as a BSE surveillance case.
- head sent to the Alberta provincial laboratory & incinerated.
- no part of the cow entered the human food chain.
- the rest of the carcass entered the rendering stream.

- **May 16, 2003**

- preliminary diagnosis of BSE at provincial laboratory.
- confirmed:
 - CFIA's National Centre for Foreign Animal Disease on May 18th.
 - International Reference Laboratory in the United Kingdom on May 20th.
 - OIE notified May 20th.
 - Public announcement by Minister of Agriculture and Agri-food May 20th.

Epidemiological Investigation (1)

- **History of the index case:**

- 6 year old beef cow.
- born March 22, 1997 prior to feed ban later that year.
- spent the last six months of its life in an 80-cow herd that was established in 2001-2002.

Epidemiological Investigation (2)

- The origin of the index case:
 - Bills of sale, farm records etc.:
 - 2 possible streams of cattle identified.
 - traced the sequence of farms through which the animal passed during its lifetime.
 - 80 potential candidates.
 - narrowed down to 7 by further investigation.
 - by June 95% confident the animal was from the blue stream.

Epidemiological Investigation (3)

- Identified cattle that may have spent time in herds with the infected cow during its lifetime.
- Trace back through twelve possible premises.
- Trace forward of three premises.
- Trace out of sales of possible cohorts:
 - more than 2,700 animals destroyed
 - more than 2,000 24-months of age or older tested
 - » ALL negative by rapid test and IHC

Epidemiological Investigation (4)

- Blood and tissues collected from all animals.
- DNA testing employed.
- Ruled out several potential herds in which the cow may have been born.
- Genetic profiling of index case against culled animals.
- Source farm confirmed in September with match of sire, dam and progeny DNA.
- Eartag of progeny further confirmed source.

Disposal of Meat and Bone Meal (MBM) Made from the Index Case

- The renderer & the feed mills had an excellent compliance with the feed ban.
- Up to 1,800 farms received potentially contaminated MBM:
 - 600 bulk feed and 1200 bagged feed.

Disposal of Meat and Bone Meal (MBM) Made from the Index Case

- On-farm investigations on 200 farms to evaluate the risk exposure of ruminants to MBM:
 - 96% - no exposure
 - 4% - potential exposure
- 3 farms quarantined & 63 cattle that may have eaten poultry feed were destroyed:
 - no further action
 - very small probability of exposure .
 - impending enhancements to BSE risk management.

Origin of the Infection

- Possibilities considered:
 - Imported animal
 - Indigenous case
 - Exposure to contaminated feed
 - Maternal transmission
 - Spontaneous mutation of prion
 - Other transmissible spongiform encephalopathy
 - Agro-terrorism event

Epidemiological Investigation (5)

- Imported animal ruled out.
- Dam tested negative therefore not maternal transmission.
- Molecular characterisation of prion shows not spontaneous.
- Typing of prion by world reference laboratory confirmed not another animal TSE.
- Chain of evidence review and audit of laboratory quality assurance precludes deliberate event.

Source of BSE

- Consumption MBM contaminated with BSE prion produced prior to 1997 feed ban:
 - feed ban parameters
 - mammalian to ruminant feed ban (with exceptions) introduced simultaneously in Canada & USA in 1997.
 - exceptions:
 - pure porcine meal
 - pure equine meal
 - from all species
 - » milk
 - » blood
 - » gelatin
 - » rendered animal fat

Source of Contaminated MBM

- Imported live cattle from UK:
 - 191 live cattle imported from UK in 1980s.
 - Importations ceased in 1989:
 - all remaining imports placed under surveillance.
 - BSE detected in one of these animals in 1993.
 - herd of origin, progeny and all remaining 122 imported animals removed, slaughtered & incinerated.
 - brains collected and tested negative.
 - brains re-examined with IHC and reconfirmed negative.

Source of Contaminated MBM

- Prior to 1993, 59 slaughtered, 9 died on farm.
- Rendering & feeding practices prior to feed ban would have allowed low cycling of BSE.
- BSE index case in Canada is a sentinel for the presence of BSE in North America:
 - due to the extensive integration of the cattle industries between Canada & USA.

Epidemiology Conclusions

- Our considered evidence based determination:
 - indigenous case traced to farm in Saskatchewan confirmed via DNA with corroboration by animal ID.
 - born prior to ruminant feed ban in March 1997.

Conclusions

- **Exposed to contaminated feed early in life:**
 - calf starter ration containing meat and bone meal produced prior to feed ban.
 - source of contamination asymptomatic U.K. animal imported into North America between 1982-1989 which entered feed chain prior to removal of all U.K. origin animals in Canada in 1994.

A Canadian Perspective

- Canada's domestic experience with BSE is truly unique.
- Public and consumer confidence maintained:
 - unprecedented increase in beef consumption.
 - provides foundation for recovery.
- Resulting policy environment different:
 - focus on progressive, considered, science based, integrated measures.

Impacts

- However, the economic impacts are substantial.
 - Canada exports a significant proportion of its beef and cattle.
 - The cost to Canada is billions of dollars and growing.
-