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## REPORT ON THE INVESTIGATION OF THE THIRTEENTH CASE OF BOVINE SPONGIFORM ENCEPHALOPATHY (BSE) IN CANADA

### BACKGROUND

On June 2, 2008 a cow on a dairy operation in the Fraser Valley area of British Columbia was destroyed following a brief illness. The carcass was collected from the farm by a disposal company on June 3, 2008, and subsequently selected for sampling by the Canadian Food Inspection Agency (CFIA) under Canada's National BSE Surveillance Program. Diagnostic specimens were submitted to the British Columbia Ministry of Agriculture and Lands (BCMAL) Laboratory, where they were screened for BSE using a Prionics Check PrioSTRIP rapid test (June 3, 2008). The result of this preliminary test did not rule out BSE. In accordance with the prescribed testing protocol, the test was repeated and produced a second reaction. Samples were then forwarded to the National BSE Reference Laboratory in Lethbridge, Alberta, where rapid screening tests to validate these results were also positive (Prionics Check Prio-strip - June 5, 2008; Prionics Check Western Blot - June 6, 2008; Hybrid Western Blot - June 6, 2008; BioRad TeSeE Elisa - June 6, 2008). On June 12, 2008, these results were confirmed by the Scrapie Associated Fibril Immunoblot. As the positive sample was submitted from a third party premise, the CFIA conducted an investigation to confirm the sample's identity using DNA analysis. No part of the carcass of the affected animal entered the human food supply and no specified risk materials (SRM) entered the animal feed chain.

The CFIA immediately initiated an epidemiological investigation based on the recommended BSE guidelines of the World Organisation for Animal Health (OIE). Specifically, the CFIA investigated:

- ⚡ the birth cohort (all cattle born in the same herd as, and within 12 months of the birth of the BSE -positive animal);
- ⚡ the feed cohort (all cattle which during their first year of life, were reared with the BSE positive animal and which investigation showed consumed the same potentially contaminated feed during that period); and
- ⚡ feed to which the animal may have been exposed early in its life.

### ANIMAL INVESTIGATION

The positive animal was a Holstein cow born on April 22, 2003, and was 61 months of age at the time of death. The animal was born, raised and spent its entire life on the same farm. The cow had been non-ambulatory (downer) and receiving medical care for two weeks. However, when the animal's condition failed to improve the producer elected to humanely destroy it, and because it met the inclusion criteria of Canada's National BSE Surveillance Program, arrangements were made to forward appropriate samples for laboratory evaluation.

The birth farm is a dedicated dairy operation. The feed cohort was determined to comprise 207 animals, which along with the case animal, were raised on the birth farm. This cohort consisted entirely of Holstein females. No males were retained or raised on the farm and therefore males were excluded from the investigation because they were not exposed to the same potentially contaminated feed as the case animal. The trace-out investigation of the feed cohort located 79 live animals on the premises. These animals are currently under quarantine pending humane destruction and disposal. The following is the disposition of the remaining 128 feed cohort animals:

- ⚡ 102 animals were traced and confirmed to have died or been slaughtered;
- ⚡ 13 animals were traced and presumed to have died or been slaughtered; and
- ⚡ 13 animals were determined to be untraceable because of records limitations.

### FEED INVESTIGATION

The feed investigation focused on feeds to which the case animal may have had access during its first year of life and on the manufacturing practices used to produce each of these feeds.

All feed products to which the BSE case animal had access were intended for feeding to ruminants. These consisted of farm - grown and purchased forages and feed products from four different commercial suppliers. On-farm mixing equipment consisted of a mixer wagon used to combine forages with commercial products for lactating and dry cows and heifers. A dog on the farm was fed in the house, away from the dairy operation, thereby eliminating pet food as a potential source of prohibited material.

For the first two months of its life, the BSE case animal was housed individually in a calf hutch and fed milk and commercially prepared heifer ration. From two to twelve months of age, the animal was housed in a series of indoor group pens with animals of similar age and continued to be fed heifer ration as well as distiller's grains and trace mineralized salt.

Other commercial products used on the farm included complete rations for the lactating and dry cows as well as a dry cow mineral. These products were not fed to the BSE case animal prior to twelve months of age, however, the same on-farm mixer wagon was used to mix rations for both the BSE case animal and the older animals.

The trace mineralized salt blocks, dry cow mineral and distiller's grains used on-farm were obtained from specialized facilities not handling prohibited material and delivered in dedicated trucks. These products were ruled out as possible sources of contamination.

Following the recommendations of the World Health Organization, Canada implemented a ruminant feed ban in 1997 prohibiting the use of certain animal protein products, known as prohibited material, in the manufacture of feed intended for ruminants. However, these materials could be utilized in the manufacture of feeds for non-ruminant species provided that appropriate measures were taken to avoid contamination of ruminant feed.

Investigation at the commercial feed manufacturer which was the sole supplier of heifer ration and some dry cow ration, identified that this facility utilized prohibited material in the preparation of rations for non-ruminant species. Components of this facility were dedicated to the manufacture of feeds not containing prohibited material in the formula. However, bulk ingredient receiving and finished feed conveyances were cross-utilized. Written procedures and production records were insufficient to rule out possible contamination with prohibited material at these points affecting both ration types delivered to the case farm.

Investigation at a second commercial feed manufacturer that supplied the farm with the majority of both lactation and dry cow rations showed the facility handled prohibited material for a short period of time during the timeframe of interest. Review of production records for the feeds of interest did not identify avenues of contamination with prohibited material.

Investigation at the third commercial feed manufacturer that supplied the farm with some dry cow ration revealed this facility was not handling prohibited material during the time frame of interest. Feeds from this facility were delivered in company owned trucks and were ruled out.

The fourth commercial feed manufacturer supplied the farm with one delivery of each of lactation ration and dry cow ration when the case animal was eleven months old. Investigation revealed that the facility was using prohibited material at this time. Written procedures to prevent contamination with prohibited material were in place, however, review of the production records identified the lactation feed was stored in a load out bin that previously contained a prohibited material feed without documented cleanout in between.

Considering the farm's feeding regime and specific production records reviewed, a likely source of exposure to BSE infectivity was the heifer ration. However, potential ingestion of dry cow ration from the first manufacturer or the single delivery of lactation ration from the fourth manufacturer exists and potential contamination of these products cannot be ruled out.

## INVESTIGATION OVERVIEW

The detection of this case does not change any of Canada's BSE risk parameters. The location and age of the animal are consistent with previous cases. Surveillance results to date, including this case, reflect an extremely low level of BSE in Canada.

Since the confirmation of BSE in a native-born animal in May 2003, Canada has significantly increased its targeted testing of cattle in high-risk categories advocated by the OIE (including non-ambulatory animals). This effort is directed at determining the level of BSE in Canada, while monitoring the effectiveness of the risk-mitigating measures in place. Canada's National BSE Surveillance Program continues to demonstrate an extremely low level of BSE in Canada, with 13 positive animals detected.

With respect to BSE, the safety of beef produced in Canada is assured by public health measures enacted in 2003. The removal of specific risk material (SRM) - the tissues that have been demonstrated to have the potential to harbour BSE infectivity - from all animals slaughtered for human consumption is the most effective single measure to protect consumers in Canada and importing countries from exposure to BSE infectivity in meat products.

As demonstrated by the surveillance system, the feed ban implemented in 1997 is effectively preventing the amplification of BSE in Canada's feed system. Additional regulations to enhance Canada's feed ban were enacted in 2007. The most important change is the removal of SRM from all animal feeds, pet food and fertilizer. The enhancement will accelerate progress toward eradicating BSE from the national cattle herd by preventing more than 99 per cent of potential BSE infectivity from entering the Canadian feed system. These measures are effectively minimizing the risk of BSE transmission.

Canada is officially categorized under the OIE's science-based system as a controlled BSE risk country. This status clearly recognizes the effectiveness of Canada's surveillance, mitigation and eradication measures, and acknowledges the work done by all levels of government, the cattle industry, veterinarians and ranchers to effectively manage and eventually eradicate BSE in Canada.

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