

Update on Bovine Spongiform Encephalopathy in North America

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Introduction

Bovine Spongiform Encephalopathy (BSE) is a rare, fatal neurological disease of cattle that has been linked to the human neurological illness known as variant Creutzfeldt-Jakob Disease (vCJD). These two disorders are among a family of diseases known as transmissible spongiform encephalopathies or TSEs. Several livestock and other mammalian species are affected by TSEs, most notably scrapie in sheep. TSEs are not "new" diseases; in fact, scrapie was first recognized as a disease of sheep as early as 1759 in a German manual of veterinary medicine (Brown, et al., 2003). BSE was first identified in 1986 in Great Britain, and in 1996 a reported link between human consumption of BSE-infective bovine material and vCJD led to widespread global recognition of this disease and numerous precautionary steps were taken to address the issue. The U.S. took aggressive steps early on to establish multiple firewalls to protect the U.S. cattle herd. These firewalls included: 1) a ban implemented in 1989 on importation of cattle or bovine products from countries with known cases of BSE; 2) establishment of a BSE surveillance program in 1990 targeted at the high-risk population of cattle and guided by principles established by the World Animal Health Organization (Office International des Epizooties or OIE); and 3) a ruminant to ruminant feed ban implemented by the Food and Drug Administration (FDA) in 1997. These firewalls remain in effect today, and have been further strengthened by recent federal government and industry actions. More than 180,000 cases of BSE have been found in Great Britain with over 37,000 cases being diagnosed in 1992 at the peak of the outbreak. Approximately 3,500 cases of BSE have been confirmed in 19 other European countries and Japan. Less than 1,400 new cases of BSE were diagnosed worldwide in 2003. About 154 human cases of vCJD have been identified, to date; only one case of vCJD has been reported in the U.S.

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This case involves a 22-year old British citizen who was living in Florida, but was born in England in 1979 and lived in England through the peak of the BSE epidemic in 1992. It is believed that the disease was contracted while she was living in England (Wiersma, et al., 2002).

Two cases of BSE were diagnosed in North America in 2003, one in a beef cow from northern Alberta Canada on May 20, and a second in a dairy cow in Washington state on December 23. The North American BSE cases caused Canada and the U.S. to implement several new regulations and risk mitigation measures. More than 50 countries banned U.S. beef exports. Severe economic dislocations have occurred in various sectors of the North American beef industry. This manuscript is meant to provide an update on the impact of the BSE findings in North America and an overview of some subsequent actions taken by government and industry.

Chronology of BSE Actions in North America

On May 20, Canada confirmed that a single cow in northern Alberta tested positive for BSE. The animal was condemned at slaughter, sent to a rendering plant and did not enter the food chain. Animals on three farms that were exposed to the rendered meat and bone meal (MBM) were depopulated and tested, with negative results. The case farm, the potential source farms and other farms at risk were placed under quarantine. More than 2,800 animals were depopulated and tested during the Canadian investigation. All test results have been negative.

In response to the Canadian case, the U.S. took certain actions to minimize risk. Agriculture Secretary Veneman announced that the U. S. would not accept any ruminants or ruminant products from Canada pending further investigation. Subsequently, after a thorough scientific evaluation, USDA on August 8, 2003, partially reopened the Canadian border to boneless bovine meat from cattle under 30 months of age and other ruminant products, but the border remains closed to importation of live cattle pending completion of rulemaking by USDA's Animal and Plant Health Inspection Service (APHIS).

On December 23, 2003, USDA announced the preliminary diagnosis of the U.S.'s first case of BSE in a single non-ambulatory dairy cow that had been slaughtered on De-

ember 9. The BSE world reference laboratory in the United Kingdom confirmed the case on December 25. APHIS initiated a trace back investigation on the origin of the animal. On December 24, USDA initiated a class II recall of meat from the group of animals slaughtered the same date as the cow that tested positive.

The trace back investigation indicated that the cow was 6 ½ years old and born in Canada prior to the implementation of the ruminant material feed ban that was instituted in the U.S. and Canada as a preventative step meant to eliminate the spread of BSE in cattle. DNA testing was used to supplement the records and confirm the identity of the cow. On February 9, 2004, USDA announced the completion of its field investigation. A total of 255 animals on 10 premises in Washington, Oregon and Idaho were depopulated. BSE testing on all animals was negative. An International Review Team commended USDA on the thoroughness of the investigation, and made several recommendations for consideration of additional precautionary steps for the U.S. to consider.

Strengthened Firewalls

The BSE case in Canada and subsequently in the U.S. set in motion a series of regulatory initiatives to further safeguard the domestic cattle population and U.S. citizens. On October 31, 2003, USDA issued a proposed rule to amend its BSE regulations to establish a new category for minimal-risk countries or regions. The proposal would make Canada eligible to export certain live ruminants and ruminant products to the U.S. The proposed minimum risk countries would include regions in which an animal has been diagnosed with BSE but in which specific preventative measures have been in place for an appropriate period of time that reduce the risk of BSE being introduced into the U.S. Most significantly, the proposal would allow cattle less than 30 months of age to enter the U.S. for immediate slaughter or to be moved to a designated feedlot and then slaughtered at less than 30 months of age.

On December 30, 2003, USDA announced several new regulatory initiatives in response to the single diagnosis of BSE in the U.S. These actions include bans on non-ambulatory (downer) cattle and specified risk materials (SRM), similar to the one enacted in Canada. The list of materials classified as SRM include brain, spinal cord, skull, eyes, trigeminal ganglia, dorsal root ganglia and vertebral column (excluding the vertebrae of tail, transverse processes of thoracic and lumbar vertebrae and wings of sacrum) from animals over 30 months of age. Other tissues classified as SRM include distal ileum of the small intestine and the tonsils of all ages of cattle. The following additional actions were taken by USDA; increased BSE surveillance that includes a mandatory test and hold program, finalization of an Advanced Meat Recovery (AMR) rule that will require exclusion of dorsal root ganglia from product derived from AMR systems, banning of air-injected stunning and a ban on mechanically separated meat. Additionally, USDA an-

nounced the implementation of a national animal identification system. The interim final rules for most of these regulatory initiatives were published and effective on January 12, 2004 (U.S. Federal Register, 2004).

On January 26, 2004, FDA announced additional enhancements to its existing feed regulations. The changes include prohibiting feeding ruminant-derived blood products, poultry litter and plate waste to ruminants. Most importantly, FDA will require that MBM containing ruminant proteins be handled in dedicated facilities to prevent cross contamination. Manufacturing facilities producing feed for cattle and other ruminants will be prohibited from handling any MBM containing ruminant proteins. The interim final rule to implement the new feed restrictions has not been published as of May 1, 2004.

On March 15, 2004, USDA announced the details for a temporary enhanced BSE surveillance program that will target cattle populations in which the disease is most likely to be found. Those populations include animals condemned at slaughter because of signs of central nervous system disorders, non-ambulatory cattle and animals that die on farms. APHIS estimates the size of this population to be 446,000 head, and stated that the enhanced surveillance program will sample as many of these cattle as possible. The enhanced program will use a statistical model to ensure samples are geographically dispersed. Based on the statistics, if APHIS samples as many as 268,500 cattle, the program will detect BSE at a rate of 1 positive in 10 million adult cattle with a 99 percent confidence level (USDA, 2004). Additionally, USDA will sample 20,000 apparently normal animals at 40 U.S. slaughter facilities. This BSE surveillance program significantly exceeds international standards as established by the OIE. The program will be fully implemented by June 1, 2004, and will proceed for an 18-month period.

Summary

The discovery of BSE in North America has created significant disruptions in international trade of U.S. and North American cattle and beef products. While long established animal health firewalls had been in place and are working to protect animal health, additional actions taken by regulatory agencies are precautionary steps that will further strengthen the multiple firewalls to protect human health. These actions should serve to reassure international trading partners as well as domestic beef consumers that U.S. beef is safe.

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