



## Projected Economic Impacts of a Bovine Spongiform Encephalopathy (BSE) Outbreak in Tennessee

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### Background

- Bovine Spongiform Encephalopathy (BSE) is commonly called Mad Cow Disease.
- BSE produces neurological symptoms in cattle and is progressive and fatal.
- New variant Creutzfeldt-Jakob Disease in humans has been linked to consuming BSE tainted food products.
- Animals are exposed to the disease through contaminated animal-based feed products. No mechanism for direct animal-to-animal transmission is known. Feeding of these types of products is now banned under a 1997 FDA regulation.
- The U.S. bans imports from countries with incidence of BSE (for example, the U.K. and recently Canada).

*Occurrence of BSE in Tennessee would have devastating market effects on the state's beef cattle industry. In addition, a national market price decline would occur. The value of industry output would decline dramatically due to loss of the market. The outbreak of BSE in the U.K. resulted in an immediate 40% national price decline. Similar price declines were experienced during the recent Canadian finding of a BSE infected cow. In addition to industry output losses, a decline in tourism would likely occur. The British Tourist Authority has estimated a 10% annual loss in tourism due to BSE. In the case of BSE, tourists may be deterred by fear of safety of the food supply. Since, BSE has an impact on human health, the impact this disease would have on Tennessee markets could span over several years. This analysis is confined to a single year impact.*

### Canadian Experience with BSE

*On May 20, an announcement was made that a cow infected with BSE had been located in Canada. Within a week of the announcement slaughter had fallen to less than half prior weekly amounts. Slaughter is now up to about 85% of the pre-announcement levels. However, steer prices have remained low. Within the past few months, steer prices have fallen by over 60 percent. Retail beef prices in Canada fell by 30 percent. Feeder cattle prices fell by about 18%. Many of Canada's major export markets called a halt to Canadian beef exports, including the United States. Recently, the U.S. and Mexico announced they are allowing imports of boneless meat from cattle less than 30 months of age to begin. Over 2700 cows have been destroyed as a result of a single cow having the disease.*



## Measuring the Economic Impacts

- Using TN-AIM (an IMPLAN based input-output model for the Tennessee economy), industry output of the ranch fed cattle and range fed cattle is decreased by 60%. This is to simulate a decline in market value and loss of markets that could occur with the incidence of BSE.
- Sectors representing those where tourists expend money are impacted by a 10% decline. These sectors include hotels and lodging places (18.4% of total expenditures), eating and drinking establishments (31.5%), service stations (14.3%), amusement and recreation services (10.8%), local interurban passenger transit (12.8%), and general merchandise stores (12.2%).
- To control, clean, and eliminate the threat of the disease, depopulation of 2700 head is estimated to occur. The number of animals disposed of is multiplied by average weight and the disposal costs per pound (\$.10) (University of Nebraska) to arrive at a total cost of disposal. These costs are then allocated across the relevant sectors. The Commodity Credit Corporation has funds (\$10 million) to compensate for certain costs associated with the quarantine.<sup>1</sup> These are accounted for in the analysis.

The **TN-AIM** IMPLAN based model describes the transfer of money between industries and institutions and contains both market-based and non-market financial flows, such as inter-institutional transfers. When total sales of a particular industry sector are expected to change, three types of impacts economy wide are measured: Direct, Indirect and Induced effects.

- Direct effects**-the immediate effects associated with the change in the final demand for a particular industry.
- Indirect effects**-secondary effects or production changes in backward-linked industries caused when inputs needs change due to the impact of directly affected industry.
- Induced effects**-response by all local industries caused by increased expenditures of new household income and inter-institutional transfers generated from the direct and indirect effects of the change in final demand for a specific industry.
- Total effects=direct + indirect + induced**

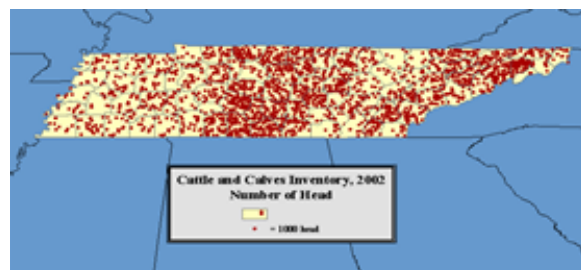
## Results

Incidence of BSE would result in a projected decline of an estimated \$243.1 million in total industry output and 10,685 jobs. These impacts are primarily from loss in market value. When the direct effects are combined with effects from decreased purchases from supplying industries and service providers and effects from less expenditure with income losses, the total economic losses are estimated at \$501 million and 16,829 jobs.

Projected Statewide Economic Impacts of a BSE Outbreak.			
Total Industry Output		Employment	
Direct Effects	Total Effects	Direct Effects	Total Effects
-\$243.1 million	\$-501.0 million	-10,685	-16,829

## Areas of Impact

As shown in the maps below, cattle and calves inventory exist throughout Tennessee. However, middle Tennessee and upper East Tennessee are inventory centers. Therefore, the impacts of BSE on the beef cattle would likely be greatest in these areas.



<sup>1</sup> The USDA has the authority to pay up to 100% of the expenses of the purchase, destruction, and disposition of animals and materials required to be destroyed.