

# BRIEFING

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## The Impacts of North American BSE Discoveries on U.S. and Canadian Cattle Prices

John M. Marsh, Gary W. Brester, Vincent H. Smith

Agricultural Marketing Policy Center  
Linfield Hall  
P.O. Box 172800  
Montana State University  
Bozeman, MT 59717-2920  
Tel: (406) 994-3511  
Fax: (406) 994-4838  
email: [ampc@montana.edu](mailto:ampc@montana.edu)  
website: [www.ampc.montana.edu](http://www.ampc.montana.edu)

*Contact:*

**John M. Marsh**  
(406) 994-5621  
[jmarsh@montana.edu](mailto:jmarsh@montana.edu)

**Gary W. Brester**  
(406) 994-7883  
[gbrester@montana.edu](mailto:gbrester@montana.edu)

**Vincent H. Smith**  
(406) 994-5615  
[vsmith@montana.edu](mailto:vsmith@montana.edu)

**Objective**

**Analysis**

**for Informed**

**Decision Making**

### Introduction

The May 2003 case of bovine spongiform encephalopathy (BSE, or mad cow disease) in Canada and the December 2003 BSE case in Washington State (a dairy animal of Canadian origin) prompted several trade sanctions that affected both Canadian and U.S. cattle producers. Immediately after the Canadian discovery, the United States closed its border to imports of Canadian feeder cattle, fed cattle, cull cows, and beef. Later in 2003, the United States reopened its border to imports of Canadian boneless beef obtained from animals less than 30 months of age.

Japan and South Korea terminated imports of Canadian beef in May 2003. After the U.S. BSE discovery in December 2003, Japan and South Korea terminated imports of U.S. beef. As of February 2005, these borders had not been re-opened.

The consequences of trade restrictions on Canadian beef producers were severe. From 1995 to 2002, Canada exported an average of 30 percent of its live cattle to the United States.

However, trade restrictions imposed by importing countries in 2003 and 2004 substantially increased Canadian domestic beef supplies and severely reduced prices. For example, the price of Canadian fed steers in March 2003 (prior to the BSE discovery) was \$77/hundredweight (U.S. dollars), but declined by 52 percent to \$37/hundredweight in September 2003. By September 2004, Canadian fed steer price had increased to about \$57/hundredweight.

The December 2003 discovery of BSE in the state of Washington reduced exports of live cattle from the United States to Canada and Mexico by 86 percent in 2004 relative to 2003. U.S. live cattle exports to all countries, however, constitute only about one-half of one percent of total domestic slaughter. More importantly, the U.S. also lost vital Japanese and South Korean beef export markets in 2004. Beef exports to Japan and South Korea normally account for over 60 percent of U.S. beef exports. U.S. beef exports in 2003 were 2.52 billion pounds, but declined by 84 percent to 0.417 billion pounds in 2004.

From 1995 to 2003, annual U.S. exports of live cattle and beef (carcass weight equivalent) ranged from 7 to 9 percent of domestic beef supplies. However, Canada's exports of live cattle and beef (carcass weight equivalent) to all countries as a percent of their domestic beef supplies exceeded 40 percent during this period. Consequently, the impacts on beef cattle prices in the United States and Canada from export market losses were considerably different.

Canada experienced precipitous declines in cattle prices as a result of lost export markets while the United States experienced considerably smaller price reductions. For example, prior to the U.S. BSE case, U.S. (Nebraska) fed steer prices averaged \$97.05/hundredweight the first three weeks of December 2003. Following the BSE announcement, average fed steer prices declined by 21 percent to \$76.27/hundredweight over the first three weeks of January 2004. But, because of relatively low U.S. cattle inventories, reduced imports of Canadian beef, and strong

consumer beef demand, U.S. beef prices rebounded. From February 2004 through December 2004, fed steer prices ranged between \$84/hundredweight and \$90/hundredweight.

This briefing paper estimates the effects of BSE-related reductions in U.S. beef and cattle imports and exports on U.S. cattle prices. The analysis considers price differences which occurred between the last normal trade year (2002) and the BSE-affected year of 2004. The statistical model used to generate estimates of the price effects accounts for other changes in supply and demand that occurred during this period.

### Analytical Approach

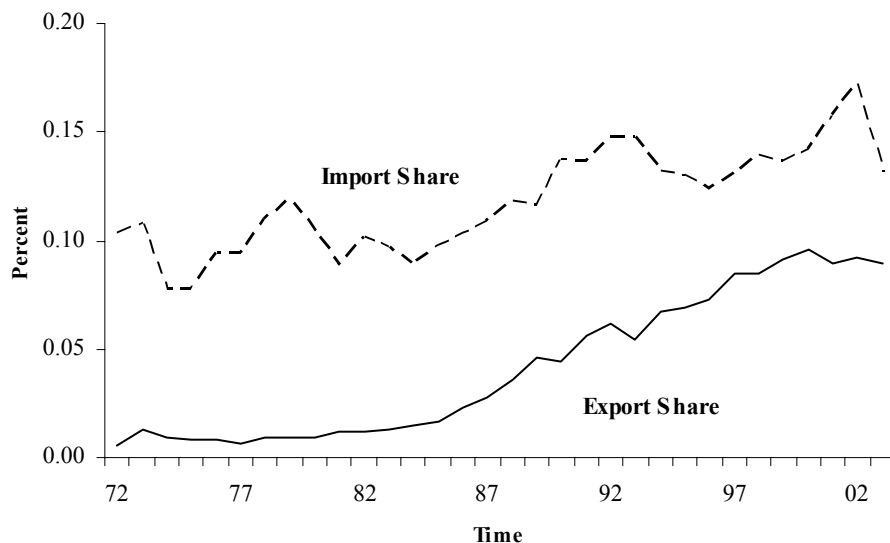
Four pieces of information were used to estimate the impacts of the North American discoveries of BSE on U.S. cattle prices. First, an estimate was required of the effect of percentage changes in wholesale beef supplies on fed cattle prices (beef price flexibility

coefficient at the slaughter-wholesale market level). Wholesale supplies are defined as wholesale beef production plus beef imports (carcass weight). Wholesale beef production includes U.S. slaughter of domestic and imported cattle. Results from a statistical model of beef demand and supply indicate that this coefficient is -1.42; that is, a 1.0 percent increase in wholesale beef supplies decreases fed cattle price by 1.42 percent (Marsh 2004).

Second, an estimate of the fed steer-to-feeder steer price transmission elasticity was required. This elasticity measures the percentage change in feeder steer price that results from a 1.0 percent change in fed steer price. The coefficient links changes in wholesale beef supplies to changes in feeder cattle prices. Previous statistical work indicates that this coefficient is 1.20 (Marsh 2003).

Third, information was required on import and export market shares in the U.S. beef sector. The beef import share is calculated by dividing the quantity of U.S. beef imports (live cattle and beef) by the total quantity of U.S. beef supplies (wholesale beef production plus beef imports). The beef export share is calculated by dividing the quantity of U.S. beef exports (live cattle and beef) by the total quantity of U.S. beef supplies. U.S. beef import and export market shares for the 1970 to 2003 period are presented (Figure 1).

**Figure 1: U.S. Beef Import and Export Market Shares of Live Cattle and Beef Supplies**



**Table 1: U.S. Import and Export Market Shares of Live Cattle and Beef Supplies and Beef Price Effects of BSE, 2002 and 2004**

Year/ Cattle Price	Import Share	Export Share	Import Price Effects	Export Price Effects	Net Price Effects
2002	15.89%	8.51%			
2004	14.04%	1.63%			
Fed Steer			\$2.28/cwt	-\$8.49/cwt	-\$6.21/cwt
Feeder Steer			\$3.93/cwt	-\$14.62/cwt	-\$10.69/cwt

Note: Market shares and price effects are based on changes from 2002 (pre-BSE trade year) to 2004 (post-BSE trade year).

Fourth, base period fed and feeder steer prices were identified to compute cattle price changes that occurred in response to North American BSE cases. Average prices occurring during December 2004 were used as base period prices. The average Nebraska fed steer price for the month was \$86.85/hundredweight and the average feeder steer price (Oklahoma City, 500-600 pounds) for the month was \$124.70/hundredweight.

#### **The Effects of the 2003 BSE Events**

The last normal year for cattle and beef trade between the United States and Canada occurred in 2002. In 2002, the U.S. beef export share was 8.5 percent. The U.S. beef export share declined to 1.6 percent in 2004 because of the U.S. BSE case (Table 1). Based on an average December 2004 fed cattle price of \$86.85/hundred weight, the loss of exports reduced fed cattle prices by \$8.49/hundredweight. For 1,200 pound fed steers, this represents a decline of \$102 per head. Based on an average December 2004 feeder

steer price of \$124.70, the loss of exports reduced feeder steer prices by \$14.63/hundred weight. For 650 pound feeder steers, this represents a decline of \$95 per head.

U.S. beef (including beef from live cattle) import shares declined from 15.9 percent in 2002 to 14.0 percent in 2004 as a result of U.S. trade restrictions imposed on Canadian beef and cattle (Table 1). The decrease in imports increased U.S. fed steer prices by \$2.28/hundredweight or \$27 per head. In addition, this decrease in imports increased feeder steer prices by \$3.94/hundredweight or \$26/head.

Reduced U.S. beef and cattle imports increased U.S. cattle prices. However, reduced U.S. beef exports decreased U.S. cattle prices. The combination of import and export share changes represents the net changes of U.S. cattle prices because of trade disruptions. Trade disruptions caused by the North American BSE cases resulted in net price declines of \$6.21/hundredweight for fed steers (about \$75/head)

and \$10.69/hundredweight for feeder steers (about \$70 per head).

#### **Conclusions**

We used a model that incorporated price flexibilities, import and export market shares, and base prices to quantify the effects of North American BSE cases on U.S. cattle prices. Reduced U.S. beef and cattle imports increased U.S. cattle prices while reduced U.S. beef exports decreased U.S. cattle prices. The net effect of the BSE discoveries was a reduction of U.S. fed cattle prices was \$6.21/hundredweight, and the net effect on U.S. feeder cattle prices was \$10.69/hundredweight. These estimates should be evaluated within the context of three concerns.

First, the estimates are based on December 2004 prices that were near historical high levels. The use of percentage changes applied to these relatively high prices may cause our estimates

to overstate the impacts of BSE cases relative to more normal cattle prices.

Second, the estimates of increases in U.S. cattle prices caused by reduced U.S. imports of Canadian beef and cattle would be lower if only the U.S. had imposed trade restrictions on Canada. But, because virtually all world beef markets imposed such a ban, the impacts on U.S. cattle prices were much larger than would have occurred had only the U.S. banned imports of Canadian beef and cattle.

Third, the estimates do not account for changes in cattle prices resulting from reduced trade in

beef slaughter by-products (hide, variety meats, tallow, etc.). By-product values declined since the announcements of North American BSE cases. To the extent that these declines were the result of reduced by-product exports, estimated price impacts reported above likely understate actual reductions in U.S. cattle prices.

### References

Marsh, John M. "Relative Volatility in the U.S. Beef Market." Briefing Paper No. 67, Agricultural Marketing Policy Center, Montana State University. Bozeman. May 2004.

Marsh, John M. "Impacts of Declining U.S. Retail Beef Demand on Farm-Level Beef Prices and Production." *American Journal of Agricultural Economics*. 85,4 (November 2003): 902-913.



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