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FAQs about Mad Cow Disease and Its Impacts

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The recent announcement of Mad Cow disease ignited fears about the safety of U.S. beef, largely because the disease is not well understood. Although scientific studies suggest the risk to human health is extremely small, the outbreak of a single cow with Mad Cow disease immediately triggered bans on U.S. beef by nearly all our major beef trading partners. As a result, cattle and beef markets were sent reeling. Market prices have now rebounded, after a temporary collapse in cattle and beef markets. Fortunately, as long as no other incidents of Mad Cow disease occur, its impacts will probably be smaller than initially feared.

This article discusses the frequently asked questions surrounding the Mad Cow disease event and its economic impacts. The FAQs focus on three areas: What happened, what are the economic impacts, and what is the outlook for the cattle and beef industries?

The Recent BSE Incident

In December 2003, the U.S. Dept. of Agriculture announced that a dairy cow infected with Mad Cow disease had been slaughtered in the state of Washington. While Mad Cow disease is a cattle disease, it has been linked to a degenerative neurological disease in humans. Despite the extremely low risk the disease poses to humans, the incident raised fresh-food safety concerns.

What is Mad Cow disease?

Mad Cow disease is the popular term for bovine spongiform encephalopathy (BSE), a degenerative neurological disease in cattle caused by proteins (prions) that create holes in the brains of cattle. BSE is in the family of diseases that includes scrapie in sheep and goats, chronic wasting disease (CWD) in deer and elk, and Creutzfeldt-Jakob disease (CJD) in humans. BSE is not a communicable disease in that it does not spread easily like viruses. Past research has concluded that it is only transmitted among cattle when the cow eats feed with bone meal from another cow infected with BSE.

How did Mad Cow disease enter the U.S. food chain?

The recent Mad Cow episode started when a six-year-old downer dairy cow was sent to slaughter. (A downer cow is a cow that cannot move on its own.) Its nervous tissues—brain, spinal cord, and other neurological tissue—were tested for BSE as required for all downer animals. Initial assessments indicated that the downer status was caused by injury from the delivery of a calf, so meat from the animal was processed for hamburger. Since the announcement, meat from the slaughter plant was recalled and USDA traced the life history of the cow. While the cow was born in Canada, there has been no final determination as to how or where the cow contracted BSE.

What is the risk to human health?

While humans cannot contract BSE, researchers have linked a new variant form of Creutzfeldt-Jakob disease (vCJD) to



BSE. Like BSE, vCJD results in a loss of brain functions and death. Some researchers have suggested that the consumption of brain or spinal tissue from BSE-infected cattle may increase the risk of vCJD.

The risk to human health from BSE is extremely low. U.S. consumers do not typically eat the tissues that harbor prions, the causal agents of BSE or vCJD. Prions are found in nervous tissues (brain and spinal cord) rather than in the muscle tissues that are typically consumed in U.S. beef. Moreover, most of the meat consumed in the U.S. comes from animals that are less than 30 months of age. Commonly accepted science indicates that cattle this young cannot contract BSE.

The Economic Impacts of BSE

The BSE announcement immediately triggered bans on U.S. beef exports across the globe and sent U.S. cattle and beef prices tumbling. The economic impacts will vary widely by geographic area and by food chain participants. Cattle owners will bear the brunt of the economic impacts. Given the heavy concentration of cattle production in the seven states of the Kansas City Federal Reserve district, (Colorado, Kansas, Nebraska, Oklahoma, Wyoming, western Missouri, and northern New Mexico) the economic impacts will be larger there than in the rest of the nation. However, thanks to a quick recovery in cattle and beef markets, the impacts could be smaller than expected.

What is the beef sector?

The economic impacts will be spread across four parts of the beef sector—two in the farm economy and two outside the farm economy:

- *Cattle ranchers*, who breed cows and raise feeder calves to place in feedlots.
- *Cattle feeders*, who produce cattle for slaughter by feeding feeder calves in feedlots.
- *Beef processors*, who slaughter live cattle and produce wholesale (boxed) beef.
- *Retailers* (grocery stores and restaurants), who further prepare beef for consumers.

What was the reaction of our trading partners?

Most beef trading partners immediately banned the importation of U.S. beef. Beef exports were expected to account for 10.4 percent of U.S. beef production in 2004. Japan is our largest export market (more than a third of U.S. beef exports) and appears very reluctant to renew U.S. beef imports (Chart 1). After the Canadian Mad Cow disease incident in May, Japan and South Korea expressed concern that U.S. exports contained beef from animals born in Canada. Notwithstanding those concerns, U.S. beef represents a sizable portion (20 percent) of total Japanese beef consumption, and beef shortages may ultimately change Japan's perception of the situation.

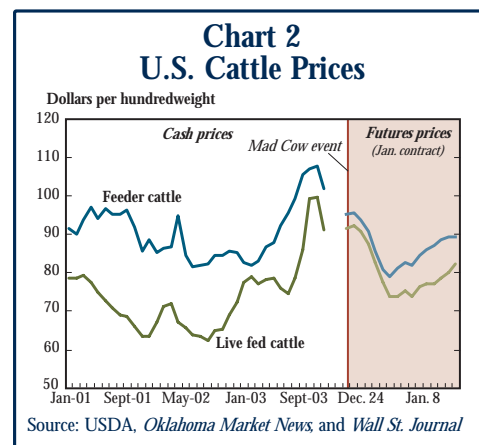


Table 1

*Economic Impacts on the Cattle and Beef Industry
First Quarter 2004*

Farm Level Impacts (Cattle Industry)	
<i>Cattle-feeding Industry</i>	
Estimated cattle slaughter	5,700,000
Estimated loss per hundredweight (Dec. 23 futures price minus Dec. 31 futures price)	\$18.35
Total loss	\$1,302,207,750
<i>Ranching industry</i>	
Estimated cattle placed in feedlots	5,700,000
Estimated loss per hundredweight (Dec. 23 futures price minus Dec. 31 futures price)	\$16.80
Total loss	\$622,440,000
<i>Wholesale and Retail Beef Industries</i>	
Estimated retail value for 2003	\$70 billion
Estimated losses	
Low: 5% (Boxed beef price declines as of Dec. 31)	\$ 875,000,000
High: 10% (Beef carcass equivalent decline as of Dec. 31)	\$1,750,000,000
Slaughter cattle average weight of 1,245 lbs. Placement cattle average weight of 650 lbs.	

What was the initial market reaction?

The announcement of BSE and the global bans on U.S. beef led to an instant collapse in U.S. cattle markets. Cash and futures prices plummeted for both live cattle (cattle ready for slaughter) and feeder cattle (cattle ready for placement into feedlots). After the BSE announcement, cattle futures prices dropped roughly 20 percent, moving down the market limit on all trading days from Dec. 23 to Dec. 31 (Chart 2). The market limit is the most cash or futures prices can fall or rise in a day before trading is halted. In response to plummeting prices, the Chicago Mercantile Exchange raised the market limit from \$1.50 to \$7.50 per hundredweight.

What is the economic impact to the cattle industry?

Assuming the price declines between Dec. 23 and Dec. 30 hold, revenue losses to the cattle industry could reach \$2 billion in the first quarter of 2004. Losses to the cattle feeding industry could reach \$1.3 billion, with the cattle and calves (ranching) industry losing an additional \$600 million (Table 1).

What is the economic impact to the wholesale and retail beef industry?

The economic cost to the beef industry could reach \$1 to \$2 billion in the first quarter of 2004. Retail and wholesale beef prices dropped between 5 and 10 percent after the BSE announcement. In 2003, beef accounted for \$70 billion dollars on a retail basis (Table 1).

What is the impact on the U.S. economy?

While the economic cost of the BSE incident might be large in value (between \$3 and \$4 billion in the first quarter of 2004), it is small relative to the overall U.S. economy. The cattle and beef industries account for only 0.4 percent of the U.S. economy (Table 2). The \$3 to \$4 billion combined loss accounts for less than 5 percent of the total receipts of the beef sector.

What is the impact on the Kansas City district economy?

The impacts of the BSE incident will be borne heavily in the Kansas City Federal Reserve District, which accounts for 43 percent of the U.S. cattle industry. Still, the impacts will vary widely across the Kansas City district economy. Based on farm and food manufacturing cash receipts, the cattle and beef sector accounts for roughly 1.8 percent of the district economy, suggesting the impacts for the district as a whole could be small. However, the impacts in Nebraska and Kansas could be more significant as the cattle and beef industries account for 5.5 and 3.2 percent of gross state product, respectively (Table 2).

The BSE incident could deal a major blow to the Kansas City district's farm

economy. Cattle and calves account for roughly half of the district's gross farm cash receipts. The \$2 billion loss in the cattle industry could translate into an \$850 million loss in the district.

The district is also home to roughly a third of U.S. beef packing activity. Assuming that stock prices are capitalized income streams, the initial 10 percent decline in many beef packer stock prices suggests the market expects future earnings to fall 10 percent. However, by the second week of January, beef packer stock prices have rebounded, suggesting a smaller impact on future earnings. Moreover, the BSE incident may not lead to dramatic changes in cattle slaughter or factory employment. Once cattle reach slaughter weight, they need to be slaughtered regardless of the slaughter price. By Jan. 16, less than 800 job losses had been announced at beef packing plants in the Kansas City district, and less than 1,000 jobs were lost nationwide.

How far will cattle prices fall?

Market analysts expected cattle prices ultimately to fall between 15 and 20 percent. Price elasticity studies indicate that domestic cattle prices decline roughly 1.6 percent for every 1 percent increase in supply. In the extreme scenario, all of the beef earmarked for foreign markets would have to be consumed domestically. Thus, domestic supplies would increase by the 10.4 percent of U.S. beef production that

Table 2

Cattle and Beef Industry Gross State Product Estimates

	Cattle Industry (Farm Level)			Beef Processing Industry			
	Cattle's Share of Farm Receipts ²	Farms Share of GSP ³	Cattle's Share of GSP	Beef's Share of Food Processing Receipts ¹	Food Processing Share of GSP ³	Beef's Share of GSP	Total Share of GSP
	(Percent: Ave. 1997 to 2001)	(Percent)	(Percent)	(1997)	(Percent)	(Percent)	(Percent)
U.S.	19.1	1.26	0.24	8.5	1.50	0.13	0.24
Tenth District	48.2	2.55	1.23	24.7	2.14	0.53	1.23
Nebraska	51.3	7.72	3.96	42.2	3.63	1.53	3.96
Kansas	57.5	3.94	2.27	48.7	1.91	0.93	2.27
Wyoming	73.2	2.71	1.98	0.0	0.45	0.00	1.98
Oklahoma	50.2	2.40	1.20	0.2	1.16	0.00	1.20
Colorado	53.5	1.39	0.74	1.9	1.80	0.03	0.74
New Mexico	37.6	2.05	0.77	0.0	0.47	0.00	0.77
Missouri	19.0	1.39	0.26	1.2	3.24	0.04	0.26

¹Calculations based on 1997 Census of Manufacturers for NAICS 3116111 and 311612a

²Calculations based on USDA farm cash receipts for cattle and calves industry

³Calculations based on BEA, Gross State Product Data

was expected to be exported in 2004. Under those assumptions, the increase in supply would create an expected 16.6 percent decline in cattle prices (10.4 * - 1.6). On Dec. 31, 2003, cattle futures prices bottomed at roughly 20 percent below the pre-BSE levels. Since then cattle futures prices have rebounded. On Jan. 16, cattle futures prices were 10 percent below pre-BSE levels.

Will U.S. beef prices fall?

U.S. beef prices have dropped, but the declines were not as large as the drop in cattle prices. The price of boxed beef (a wholesale price) ended the year 7 percent below its pre-BSE levels and ultimately fell 15 percent. By Jan. 16, wholesale beef prices rebounded to 10 percent below pre-BSE levels.

What is the impact on demand?

Research indicates that the impact on domestic demand could be small because consumers respond differently to food safety concerns than to long-run health concerns. Research has shown that food safety concerns create only short-run impacts on consumption. After an initial reaction, people tend to return to their eating habits. Wholesale beef companies, fast food restaurants, and similar beef industry participants have reported no measurable fall in U.S. beef consumption. Moreover, the National Cattlemen's Beef Association reported that 89 percent of consumers expressed confidence in the safety of U.S. beef after the BSE incident, compared to 88 percent in September 2003.

Will the impact of BSE in the U.S. be similar to Canada?

The U.S. industry is not expected to experience the losses suffered by the Canadian industry because only 10 percent of U.S. production is targeted for export markets, compared to 40 percent in Canadian. At their bottom, Canadian cattle prices were roughly 35 percent below pre-BSE levels. In contrast, U.S. cattle prices bottomed at a level 20 percent below the pre-BSE level.

What is the economic impact on various food supply chain participants?

According to a variety of market indicators, cattle owners have borne the brunt of the BSE event. Feeder cattle and live cattle prices fell 20 percent. Beef packers experienced slightly smaller declines in revenue. Boxed beef (wholesale) prices fell roughly 15 percent. Beef packer stock prices dropped 10 percent immediately after the BSE announcement but have rebounded. The 10 percent decline suggests a 10 percent decline in income. Restaurants and other retailers faced smaller impacts. After falling 5 percent, stock prices at various fast food restaurants rebounded.

How are producers, packers, and retailers responding?

Cattle producers that were thinking about making investments in herd expansion have taken a wait-and-see approach before making any additional investments. Packers and retailers have responded to the increased uncertainty in the market by using beef inventories held in cold storage. They purchased smaller quantities of cattle and beef.

The Outlook for Cattle and Beef Markets

The outlook for cattle and beef market depends on when our trading partners resume importing U.S. beef. Various indicators suggest that trade could resume as early as this spring. However, various regulatory changes may need to be enacted before trade resumes.

What regulatory changes are being made to re-open global markets to U.S. beef?

Several regulatory changes have been implemented or are being discussed to help renew U.S. beef exports. USDA has now banned downed cattle from being processed for human food products. Restrictions on the scraping of meat from bones have been put in place. Additional restrictions could limit the processing of specific cattle parts for human consumption.

Some observers have called for increasing the number of cattle randomly tested for BSE. Current U.S. policy is to test roughly 20,000 cattle each year for BSE (one out of every 1,700 head slaughtered). If the U.S. followed European standards, all cattle over 30 months of age would need to be tested. Japan is requesting that every animal be tested for BSE.

New restrictions for the cattle feeding industry are being discussed. Specifically, the banning of poultry litter and cow blood from cattle feed is being discussed. Other restrictions could separate the feed for ruminants, such as cattle, from other animal feed.

When will the situation be resolved?

The situation will be resolved when our key trading partners re-open their borders to U.S. beef. Mexico, which accounts for 20 percent of U.S. beef exports, appears to be willing to resume beef trade in the near future. Expectations of renewed trade with Mexico have helped to spur the rebound in cattle and beef prices.

Japan, the largest importer of U.S. beef, appears less willing to resume U.S. beef imports. Japan's willingness to resume trade may hinge on its ability to find substitute supplies of grain-fed beef, the type of beef favored by Japanese consumers. This might be a challenge as other major beef exporters (Brazil, Argentina, and Australia) export primarily grass-fed beef.

Futures markets indicate that some resolution to the BSE situation could emerge this spring. On Dec. 30, February futures contracts for live and feeder cattle fell the market limit. On the other hand, futures contracts for April, May, and June did not fall the market limit. This divergent pattern in prices was repeated in the first few trading days of January and could indicate a potential market change sometime this spring. At this time, most market analysts have projected losses only for the first quarter of 2004; but, of course, only time will tell.