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BSE, U.S. Beef Trade and Cattle Feeding Industry

Lal K. Almas

West Texas A&M University, Division of Agriculture,
WTAMU Box 60998, Canyon, Texas 79016
lalmas@mail.wtamu.edu

W. Arden Colette

West Texas A&M University, Division of Agriculture,
WTAMU Box 60998, Canyon, Texas 79016
acolette@mail.wtamu.edu

Stephen H. Amosson

Texas Cooperative Extension
Texas A&M Research and Extension Center,
6500 Amarillo Blvd. West, Amarillo, Texas 79106
samosson@ag.tamu.edu

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Abstract

A brief review of the beef and cattle market following the diagnosis of Bovine Spongiform Encephalopathy (BSE) in Canada and U.S. in 2003 is conducted. The focus is on the recent changes in the beef market experienced by major exporting and importing countries with special emphasis on the beef trade and cattle industry in the U.S.

A single case of BSE in the U.S. has significantly disrupted global beef trade. Many countries banned beef imports from the U.S. and Canada. Continuation of these bans through 2004, particularly for the U.S., resulted in reduced beef exports. Brazil has become the number one beef exporter with estimated exports of 1.47 million tons in 2004 and is forecast to export 1.62 million tons in 2005. U.S. is the largest beef importer in the world.

U.S. beef exports were a record 1.143 million tons in 2003. Beef exports from the U.S. for 2004 have been 0.202 million tons, just 17.7 percent of 2003 exports. The value of beef export losses for 2004 has been estimated as \$2.73 billion. U.S. is forecast to export 0.272 million tons in 2005, representing a 35 percent increase over 2004. However, the beef export forecast for 2005 is still far below the pre-BSE levels. On the other hand U.S. beef imports have increased from 1.36 million tons in 2003 to 1.63 million tons in 2004. Imports are expected to reach 1.7 million tons in 2005.

The lack of Canadian beef and live cattle imports, in conjunction with already tight U.S. supplies and strong demand, drove both beef and cattle prices up in the latter part of 2003. However, a decline of 29 percent in beef prices was experienced from December 2003 until March 2004 after the diagnosis of BSE in the U.S. BSE has also impacted live cattle trade, especially among the North American Free Trade Agreement (NAFTA) partners.

Introduction

A case of Bovine Spongiform Encephalopathy (BSE), commonly known as “mad cow disease ” was first reported in Canada on May 20, 2003, and then on a dairy farm in the state of Washington, United States of America, on December 23, 2003. The finding of BSE in North America caused many countries around the world to ban beef imports from both countries. Past BSE outbreaks in the United Kingdom and Japan have resulted in reduced domestic consumption of beef produced in those countries and increased beef imports from BSE-free countries. Consequently the discovery of a single case of BSE in the U.S. was expected to result a decline in domestic consumption of beef in the U.S. However, domestic consumption of beef in the U.S. during 2004 actually increased when compared to the same time in the previous year. Food safety continues to be a concern of domestic and export customers. Uncertainties in the international beef market still exist on reopening the export market with Japan and the prospects of resuming beef trade with Canada.

The top ten beef producing countries in the world are U.S., Brazil, EU, China, Argentina, Mexico, India, Australia, Russia and Canada. U.S., EU, China, Brazil, Mexico, Russia, Argentina, India, Japan, Canada and Australia are the leading beef consuming countries (Table 1). Major beef exporting countries in the world are Brazil, Australia, Canada, U.S., New Zealand, and India. Major beef importing countries include U.S., European Union, Japan, Russian Federation, and South Korea (Table 2). World beef trade was significantly disrupted after BSE was reported in Canada and the U.S.. Total beef exports from exporting countries are forecast at 6.17 and 6.57 million tons for 2004 and 2005, respectively. U.S. has only exported 0.20 million tons beef in 2004 as compared to 1.143 million tons in 2003 due to a single case of BSE in the U.S. Uncertainties about the length of time before importing countries lift trade

restrictions on U.S. beef still do exist even after a year, trade forecasts for beef, therefore, are based on the country's current policy assuming that the import bans remain in effect.

Brazil has surpassed Australia as the top world exporter of beef, with exports expected to approach a record 1.47 million tons. Brazil has made outstanding strides in increasing its production, which is forecast to grow 5 percent in 2005. Australia is expected to increase its exports to Asian markets that have banned imports of U.S. beef. Canadian exports in 2005 are forecast to increase 48 percent over 2003 exports, as exports primarily to the United States recover to pre-BSE export levels. The United States will remain the world's largest import market.

In 2005, Japan, which has not recovered to its pre-BSE import volumes, is expected to fall to the third largest beef import market as imports from the United States and Canada are currently banned. The bans on U.S. beef in Asia have resulted in Russia and EU moving to second and fourth in the import list respectively. Russia is still not importing at its historical high in 1999 and with its limiting tariff-rate quota, is not expected to be an expanding imports market in 2004. Meanwhile, the EU is likely to remain a net importer, since prices remain high and its exports have never fully recovered from the BSE discoveries. Japan and Korea's bans on U.S. and Canadian beef are expected to constrain imports in 2004 likely pushing import beef prices higher.

The objectives of the study are to review the overall situation in U.S. beef and cattle industry and estimate export losses following the diagnosis of BSE in Canada and U.S. in May and December 2003, respectively. The study focuses on the recent changes in the beef trade by U.S. and Canada with special emphasis on the beef exports from U.S.

History of BSE and Its Impacts on Beef Consumption

BSE is a neurological disease in cattle. There is no treatment and infected cattle die. BSE was first reported in the United Kingdom in 1986. Since then, UK has been disposing of BSE infected cattle with indemnity payments to farmers and adverse effects on beef production, consumption and market prices. BSE peaked in British cattle in 1992 when 36,680 cases were confirmed. Since then, there has been a steady decline in reported cases. It has been observed that the sales of beef products dropped by 40 percent after 1996 outbreak of BSE in the UK. Household beef and veal consumption was reduced by 26 percent. In economic terms total costs of BSE to UK have been estimated to be over \$5 billion. Beef consumption in Japan started to decline when the UK government, in 1996, made an announcement of a possible link between consumption of BSE-infected meat and the development of Creutzfeldt-Jacob disease (vCJD). This announcement may not have had a significant impact on Japanese consumers because the sources of beef in Japan were domestic production and imports from BSE-free countries e.g. Australia and the United States at that time. Caswell and Mojuszka (1996) have suggested that the consumers may not change their consumption patterns significantly unless observing an outbreak in their own supply. At the same time, as a precautionary measure, the Japanese government banned EU beef and related products. However, on September 10, 2001, Japan reported its first case of BSE within the country. The case was the first outside of Europe as well as the first in Asia. The Japanese beef industry reeled under the mixed reaction in its domestic and export markets. Many countries such as South Korea, Singapore, China, Malaysia, and the Philippines banned Japanese beef.

The Japanese government adopted strict standard as well as tested one million cattle to stop the spread of the disease. Concurrently, it tried to win the consumers' confidence as well as

persuaded other countries to drop bans on its meat, but all in vain. Consumption of beef in Japan fell sharply (see Table 2) and beef prices dropped significantly. The Foreign Agricultural Service (FAS) of the United States Department of Agriculture (USDA) reported in early 2002 that about 60 percent of Japanese consumers have stopped eating beef since the first case of BSE. The imported beef was blamed as the source of the infected meat. The discovery of subsequent cases of BSE in November 2001, and later, further aggravated the consumer concerns about beef safety in Japan and thus affecting its beef industry adversely.

Canada, in May 2003, tested a cow positive for BSE. Canadians consume half of their beef production. Most of the remaining beef is exported to its neighbor the United States, which banned imports of cattle and beef after the case of BSE was confirmed. This caused a sharp decline in prices of cattle for slaughter in Canada. Sudden change in cattle prices indicates that the BSE is considered one of the sources of market disruption in the beef and cattle industry.

Since 1986 many research studies have been conducted to investigate consumers response to BSE. The researchers and economists have reported economic consequences of BSE outbreaks. The brief synopsis of these studies follows. Ashworth and Mainland (1995) reported some of the economic implications of BSE on the British meat industry. Burton and Young (1996) also investigated the effect of BSE on the demand for beef and other meats in U.K. Latouche, Rainelli, and Vermersch (1998) analyzed consumer behavior changes due to BSE crisis using a contingent valuation method. Verbeke and Ward (2001) used an Almost Ideal Demand System (AIDS) model to analyze fresh meat consumption in Belgium and concluded that BSE publicity has a negative impact on beef expenditure. Adda (2002) has concluded that consumer behavior is not influenced by BSE crisis in low and high stock consumers. Jin and Koo (2003) have observed a structural change in Japanese consumers' preferences and shift from

beef to its substitutes. Jin, Skripnitchenko, and Koo (2004) have estimated effects of BSE in U.S. on price and domestic consumption of beef in U.S. as well as its beef exports.

Data Sources

Production and consumption data for beef and veal, as well as, beef import and export data by selected countries were retrieved from livestock and poultry world markets and trade, FAS of USDA. All cattle and calves imported by the U.S. are from Canada and Mexico. The cattle import data, as of October 2004, were obtained from Economic Research Service (ERS) of USDA. Similarly the average monthly retail prices for beef released by ERS/USDA were used in this paper to observe and analyze any short term beef price changes and market disruption due to BSE in Canada and U.S. The beef trade data for individual countries is also available from FAS/USDA. These data were used for comparative analyses of some of the beef importing and exporting countries.

Findings and Discussion

All the findings and results in this study are based on the data available as on October 2004. The current situation in the beef industry in the U.S. after BSE in Canada and U.S. and the overall beef trade by U.S. in the world beef market is presented. The focus of the paper is on the post-BSE changes in the North American beef market especially in the U.S. and Canada.

U.S. Beef Trade and Cattle Industry:

The U.S. was the world's largest beef exporter by value of product and the second largest exporter by volume until 2002. Japan, South Korea, Mexico, and Canada have been the top markets for U.S. beef. The U.S. had record beef exports during 2003 valued at \$3.14 billion (Table 3a). However, on December 23, 2003, the U.S. suffered a major trade disruption upon the discovery of one case of BSE. This resulted in the closing of many foreign markets to beef

imports from the United States. Canada and Mexico are the only two major markets that have reopened their markets to allow imports of U.S. beef. The U.S. beef exports for 2004 are 0.202 million tons as markets remain closed until importing countries announce a change in policy. This represents just 17.7 percent of 2003 exports of 1.143 million tons (Table 2). The data as of October 2004 indicates that the U.S. has exported beef and veal valuing \$0.4 billion, which is only 15 percent of the export value recorded in 2003 (Table 3a). The difference in export values for 2003 and 2004 suggests that a single case of BSE has resulted into an estimated loss of \$2.73 billion and the forecast for 2005 is not encouraging, by historical standards, as U.S. beef exports are estimated at 0.27 million tons. This is only 24 percent of pre-BSE exports in 2003. Mexico has replaced Japan as the largest importer of U.S. beef and it appears that this trend will continue as long as import bans by other major importing countries remain in place.

BSE has also impacted the live cattle trade, especially among the NAFTA partners. In 2002, before BSE in Canada, U.S. cattle exports were 244,000 head valued at \$125 million. In 2003, cattle exports to Canada and Mexico totaled \$48.4 million (Table 3b). After the U.S. BSE case, the live cattle exports to Canada and Mexico have been only \$4.8 million. That is only 10 percent of the amount prior to BSE in U.S. and is 4 percent of the amount prior to BSE in Canada in May of 2003. Canada did relax its testing requirements for anaplasmosis and bluetongue on U.S. feeder cattle, which promises to expand market access in Canada after requirements are modified for importing cattle from countries with low risk of BSE.

Domestic consumption in the U.S. has expanded by 1.7 percent in 2004. U.S. beef production was forecast to fall 7 percent in 2004 (Table 4) due to decreasing cattle inventories and increased heifer retention as the beef industry enters the rebuilding phase of the cattle cycle. Declining cow beef production has resulted in the need for increased imports of lean

manufacturing beef to mix with fat trimmings. Value of beef imported by the U.S. in 2003 was \$2.623 billion. As of October 2004 beef imports are valued at \$2.987 billion (Table 5a). This results in a 45 percent increase in 2004 in beef import value when compared with the corresponding period of 2003. It is anticipated that in 2005, U.S. beef imports may reach 1.7 million tons. Increase in imports is due to many factors such as reduced cow slaughter, declining cow inventories, and a ban on imported Canadian cattle.

Consumer demand remains strong, which has helped support prices after the closure of most U.S. export markets. The lack of Canadian beef and cattle imports, in conjunction with already tight U.S. supplies and strong demand, drove both beef and cattle prices dramatically up in the latter part of 2003 (Figure 1). However, imports of Canadian beef have recovered to pre-Canadian-BSE levels, although only boneless products are being imported. Cattle and beef prices dropped after the announcement of a case of BSE in the U.S. but have remained high during the first quarter of 2004. Additionally, tight cattle supplies after a season of poor feeding conditions reduced production in the fourth quarter of 2003 and into the first quarter of 2004, helping offset the impact from lost export sales. Imports of live cattle are forecast at 1.1 million head and will come primarily from Mexico since Canadian live cattle are still banned from importation (Table 5b).

Beef prices in the U.S. increased from \$2.98 per pound to \$3.72 per pound from September 2003 until December 2003. This represents a 25 percent increase over the three month period (Figure 1). The December price was the highest recorded for 2003. However, the shock to average retail prices of beef was a short run effect. Beef prices in the U.S. started declining in January 2004 and continued declining until March 2004. Beef prices fell 29 percent from December 2003 until March 2004. After March 2004 prices started recovering. In July

2004 the average retail price of beef was the same as July 2003. The short run price spike appears to be a response to the supply disruption and not a shift in consumer demand. It has been observed that the lower production and robust consumer demand are helping to support cattle prices. Cattle supplies were already on a downward trend prior to the discovery of BSE, resulting from herd liquidation that started in 1996 due to drought in many areas and overall unprofitable price levels.

Canadian Beef Trade:

Canada suffered a major trade disruption with the discovery of one case of BSE in May 2003. Canada's exports fell 0.38 million tons in 2003 from 0.61 million tons in 2002. It was shut out of most export markets in the second and third quarters of 2003. In September, Canada resumed exporting boneless beef products from cattle less than 30 months of age to the United States and Mexico. Boneless beef exports completely replaced what were formerly bone-in exports. Canadian cattle are still prohibited from importation into the United States. In 2004, Canadian beef exports are expected to rebound from 2003 levels to 0.54 million tons, due to increased exports to the United States and Mexico, its two largest markets.

BSE in Canada significantly reduced live cattle exports to the U.S. in 2003. The 2003 exports amounted to only \$0.40 billion. This represented a 65 percent reduction from the \$1.15 billion in 2002 (Table 5b). There has been no export of live cattle from Canada to the U.S. in 2004 due to the existing import ban on Canadian live cattle.

Mexico:

The U.S. is the largest supplier of beef to Mexico and supplied 85 percent of Mexico's beef imports in 2003. Due to the impacts from finding BSE in the U.S., beef exports to Mexico for 2004 declined 46.70 percent from 2003. The trade restrictions on U.S. beef are now relaxed

for boneless beef from cattle less than 30 months of age, allowed a resumption of beef imports, but are expected to constrain Mexico's ability to import lower-value cow beef. However, U.S. beef has to compete with Canada to regain lost market share. This seems a challenge for U.S. in the presence of strong beef prices in the domestic market. Therefore, Canada has also an opportunity to increase its market share as Mexico's cattle herd has further declined due to drought in the last two years. High feeder cattle prices in the U.S. have encouraged exports of feeder cattle from Mexico to the U.S. resulting in reduced beef production in Mexico. Beef production in Mexico is forecast to decline in 2005. That will create more export opportunities for selected U.S. beef products.

Conclusion

Canada suffered a major trade disruption with the discovery of one case of BSE in May 2003. Canada's exports reached only 0.38 million tons in 2003 against 0.61 million tons in 2002 after it was shut out of most export markets in the second and third quarters of the year. The U.S. also faced challenges upon discovery of one case of BSE. Many foreign markets were closed for the U.S. beef imports. U.S. beef exports for 2004 are forecast at 0.20 million tons, just 17.7 percent of 2003 exports. The export data as of October 2004 indicates that the U.S. has exported beef and veal worth \$0.41 billion. This represents only 15 percent of the amount in 2003. The difference in export values for 2003 and 2004 indicates that a single case of BSE has resulted into an estimated loss of \$2.73 billion and forecast for 2005 are also not encouraging by historical standards.

A case of BSE in the U.S. has significantly disrupted the global beef trade. Many countries banned importing beef from the U.S. and Canada. Continuation of these bans through 2005 will result in reduced beef exports from the U.S. Brazil, due to its FMD status, cannot

compete to fill the import need of Japan and Korea. Australia and New Zealand are not expected to completely fill Japanese demand for grain-fed beef. Therefore, Japan will have to compete with Korea for beef from Australia and New Zealand unless additional North American beef is allowed into these markets.

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Table 1. Production and Consumption of Beef in Selected Countries and the World

	2000	2001	2002	2003	2004(p)	2005(f)
Production						
	1,000 Metric Tons (Carcass Weight Equivalent)					
USA	12,298	11,983	12,427	12,039	11,206	11,242
Brazil	6,520	6,895	7,240	7,385	7,830	8,222
EU	8,253	7,629	8,138	8,045	8,035	7,915
China	5,328	5,488	5,846	6,305	6,683	7,110
Argentina	2,880	2,640	2,700	2,800	2,900	2,730
Mexico	1,900	1,925	1,930	1,950	2,150	2,070
India	1,700	1,770	1,810	1,960	2,130	2,230
Australia	1,988	2,049	2,089	2,073	2,005	2,000
Russia	1,840	1,760	1,740	1,670	1,610	1,550
Canada	1,246	1,250	1,294	1,190	1,450	1,500
New Zealand	580	609	589	693	710	705
Others	5,812	5,193	5,431	3,968	3,951	4,008
	50,345	49,191	51,234	50,078	50,660	51,282
Consumption						
USA	12,503	12,351	12,738	12,339	12,582	12,653
EU	8,093	7,489	8,118	8,324	8,175	8,084
China	5,284	5,434	5,818	6,274	6,648	7,075
Brazil	6,102	6,191	6,437	6,273	6,415	6,665
Mexico	2,309	2,341	2,409	2,308	2,410	2,375
Russia	2,309	2,404	2,395	2,315	2,255	2,195
Argentina	2,543	2,514	2,362	2,426	2,363	2,132
India	1,351	1,400	1,393	1,521	1,590	1,605
Japan	1,534	1,371	1,285	1,324	1,126	1,116
Canada	992	969	989	1,065	1,008	1,005
Australia	645	653	696	786	756	711
Others	5,885	5,360	5,501	4,043	3,878	3,931
	49,550	48,477	50,141	48,998	49,206	49,547

Source: FAS, USDA

(p) preliminary, (f) forecast

Table 2. Major Importers and Exporters of Beef in the World Market

	2000	2001	2002	2003	2004(p)	2005(f)
Imports						
	1,000 Metric Tons (Carcass Weight Equivalent)					
USA	1,375	1,435	1,460	1,363	1,627	1,660
Russia	478	650	660	650	650	650
EU	426	394	501	517	525	535
Japan	1,016	955	678	810	604	611
Mexico	420	426	489	370	270	320
Canada	263	299	307	273	85	80
S. Korea	324	246	431	445	200	275
Philippines	118	104	126	120	125	130
Egypt	236	136	162	93	150	155
Taiwan	83	78	89	98	81	83
Hong Kong	71	71	71	81	82	85
Others	234	172	213	226	194	209
	5,044	4,966	5,187	5,046	4,593	4,793
Exports						
Brazil	492	748	881	1,175	1,470	1,620
Australia	1,338	1,399	1,366	1,264	1,300	1,300
Canada	523	574	610	384	540	570
New Zealand	505	516	505	578	600	605
India	349	370	417	439	540	625
Argentina	357	169	348	386	540	600
EU	645	595	586	437	410	370
Uruguay	236	145	259	320	400	440
USA	1,119	1,029	1,110	1,143	202	272
Ukraine	157	98	146	168	100	90
China	54	60	44	43	45	50
Others	100	82	75	24	26	32
	5,875	5,785	6,347	6,361	6,173	6,574

Source: FAS, USDA

(p) preliminary, (f) forecast

Table 3a. Value of Beef and Veal Exported by U.S. by Destination, 2001-2004

	2001	2002	2003	2004*	% Change 03-04
	Billion Dollars				Jan-Oct
Canada	0.274	0.286	0.321	0.061	???
Japan	1.246	0.843	1.167	0.001	???
Mexico	0.546	0.596	0.604	0.282	(46.70)
S. Korea	0.361	0.610	0.749	0.001	???
ROW	0.205	0.250	0.303	0.066	???
World Total	2.632	2.585	3.144	0.411	(84.56)

Data Source: USDA, Foreign Trade Statistics

* Data include Jan-Oct, 2004

Table 3b. Value of Live Cattle Exported by U.S. by Destination, 2001-04

	2001	2002	2003	2004*	% Change 03-04
	Million Dollars				Jan-Oct
Canada	155.787	50.003	27.126	4.198	(82.50)
Mexico	103.217	75.808	21.304	0.678	(95.72)
World Total	271.607	131.433	63.223	4.935	(90.75)

Data Source: USDA, Foreign Trade Statistics.

* Data include Jan-Oct, 2004

Table 4. U.S. Beef Supply and Utilization, 2001-2004

	2001	2002	2003	2004 ^E	% Change 03 to 04
	Billion Pounds				
Total Production	26.212	27.192	26.392	24.524	(7.07)
Beginning Stocks	0.525	0.606	0.691	0.518	(25.04)
Imports	3.163	3.218	3.006	3.532	17.50
Total Supply	29.900	31.015	30.089	28.574	(5.04)
Exports	2.269	2.448	2.523	0.444	(82.40)
Ending Stocks	0.606	0.691	0.518	0.625	20.66
Total Disappearance	27.026	27.876	27.048	27.505	1.69
Cattle/Calves Inventory (Million Head)	97.29	96.72	96.10	94.88	(1.27)

Data Source: USDA, Economic Research Service and World Agricultural Outlook Board

^E Estimates for 2004.

Table 5a. Value of Beef and Veal Imported by U.S. by Origin, 2001-2004

	2001	2002	2003	2004*	% Change 03-04
	Billion Dollars				Jan-Oct
Australia	0.850	0.884	0.900	0.876	21.50
Canada	1.096	1.113	0.850	0.983	57.03
Mexico	0.021	0.020	0.027	0.032	18.52
New Zealand	0.422	0.408	0.431	0.565	31.09
Uruguay	0.029	0.007	0.048	0.243	406.25
ROW	0.294	0.309	0.367	0.288	36.49
World Total	2.712	2.741	2.623	2.987	44.72

Data Source: USDA, Foreign Trade Statistics

* Data include Jan-Oct, 2004

Table 5b. Value of Live Cattle and Calves Imported by U.S. by Origin, 2001-2004

	2001	2002	2003	2004*	% Change 03-04
	Billion Dollars				Jan-Oct
Canada	1.052	1.146	0.396	0.001	???
Mexico	0.408	0.301	0.471	0.408	32.90
World Total	1.461	1.446	0.867	0.409	(41.74)

Data Source: USDA, Foreign Trade Statistics

* Data include Jan-Oct, 2004

Figure 1. Average Retail Beef Prices and Commercial Beef Production in U.S., May 2003 to October 2004

