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ECONOMIC FACTORS CONTRIBUTING TO THE U.S. BEEF PRICE SURGE IN 2003

by
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Before the December 23, 2003 reported case of *Bovine Spongiform Encephalopathy* (BSE or “mad cow disease”) in the state of Washington, the U.S. beef industry experienced record beef prices the second half of 2003. United States Department of Agriculture (USDA) and Livestock Marketing Information Center (LMIC) data show that in October 2003 nominal prices of feeder cattle, fed cattle, and boxed beef exceeded those in October of 2002 by a range of 26% to 58%. Retail beef prices also increased over this period, but to a lesser extent (about 21%). Beef price increases from October 2002 to October 2003 are given in Table 1.

Table 1. Beef Price Changes from October 2002 to October 2003

Beef Prices	Time Period	
	October 2002	October 2003
	Dollars Per Hundred Weight	
Feeder Steer	\$85	\$107
Fed Steer	\$65	\$102
Boxed Beef	\$112	\$177
	Cents Per Pound	
Retail Beef	\$3.26	\$3.93

Note: Price of Feeder Steers is Oklahoma City, Medium No. 1, 600-650 lbs.; Price of Fed Steers is Nebraska direct, Choice, 1100-1300 lbs.; Price of Boxed Beef is Central U.S., Choice cut-out value, 600-900 lbs.; and Price of Retail Beef is weighted average of Choice retail cuts.

Producers, economists, and public officials have intensely debated the relative importance of factors contributing to changes in cattle prices. Specifically, there has been strong disagreement about the relative effects on beef prices of international trade (NAFTO and WTO), meat packer concentration and economies of scale, meat packer market power and captive supplies, and traditional market demand and supply factors. Depending upon stakeholder positions, public and private policies have been advocated to deal with the financial implications of beef price changes. Examples include government sanctions in international trade, enforcement of antitrust laws, USDA marketing regulations, animal health regulations, and producer management decisions involving cash sales, hedging, contractual arrangements, or marketing alliances.

Reasons

The single case of BSE in Canada (May 2003) may have been a catalyst for the 2003 beef price surges. As a result of the reported case, the United States and 34 other countries closed off imports of Canadian live cattle and beef products. Beef imports from slaughtered animals of 30 months of age or less into the United States were later restored, but have remained relatively low since reinstatement.

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Market analysts have indicated that the primary factors contributing to the recent beef price increases reflected economic trends in the beef market. They include decreased U.S. cattle inventories since 1996 (caused by relatively low real cattle prices and drought), increasing domestic beef demand since 1998, and to a lesser extent, decreases in total U.S. net beef imports (imports less exports including live cattle) since 1993. Other factors thought to affect the price advances were October 2002-to-October 2003 decreases in slaughter cattle weights (reducing meat supplies) and increases in beef by-product values. Corn prices also decreased over this period, increasing the demand for feeder cattle due to reduced cost of gain.

Price Changes

Many producers assume that the 2003 moratorium on Canadian live cattle and beef imports was primarily responsible for U.S. beef price increases. To determine the causes of beef price advances, an econometric model of demand and supply relationships in the U.S. beef sector (feedlot, meat packing and wholesale levels) was estimated. The model was based upon economic theory of output supplies and input demands in the marketing sectors. Several economic factors were hypothesized to influence beef price increases, including: (1) domestic retail beef demand; (2) domestic cattle slaughter and average slaughter weights; (3) live cattle imports from Canada, net beef imports from Canada (imports less exports excluding live cattle), and net beef imports from other countries (excluding Canada); and (4) beef by-product values and corn prices. The focus was on changes in fed cattle prices for a one-year period of October 2002 to October 2003 (prior the BSE outbreak in the U.S.). Prices in the feeder cattle market normally follow those in the fed cattle market; therefore, the effects of these economic factors extend to the feeder market.

Based upon data from the USDA and LMIC, the percentage changes in the economic factors from October 2002 to October 2003 were: (1) domestic beef demand (measured by a beef demand index) increased 6%; (2) commercial cattle slaughter from domestic sources decreased 5.5% and average slaughter cattle weights decreased 4%; (3) live cattle imports from Canada decreased to zero, which implied a reduction in U.S. slaughter cattle supplies of about 4.5% (the Canadian import share of U.S. slaughter cattle supplies in 2002), net beef imports from Canada decreased 70%, and net beef imports from all other countries decreased 7%; and (4) U.S. by-product values (hide and offal) increased 8% and corn price decreased 14%.

Results

Table 2 gives the relative impacts of these economic factors in percentage and dollar terms. The "Factors" in the table, all statistically significant, are arranged in descending order. The percentage figures in the table (in parentheses) are generated by the econometric model. Multiplying these percentages by average fed steer price of \$83.35/cwt for October 2002 to October 2003 gives the dollar/cwt figures in the top row.

Table 2. Factors Causing Increases in 2003 Fed Cattle Prices.

Market	Economic Factors						
Fed Steer	Domestic Cattle Slaughter	Canadian Cattle Imports	Domestic Beef Demand	Slaughter Cattle Weight	Beef By-Products	Canadian Net Imports	Other Country Net Imports
Price	\$7.83/cwt	\$6.42/cwt	\$3.00/cwt	2.04/cwt	\$1.67/cwt	\$0.45/cwt	\$0.08/cwt
Percent	(9.40%)	(7.70%)	(3.60%)	(2.45%)	(2.00%)	(0.54%)	(0.09%)

Note: Net Imports in the last two columns are beef imports less beef exports, excluding live cattle.

The leading factor in the cattle price increase was the decline in domestic cattle slaughter, which increased cattle price by \$7.83/cwt, followed by the cessation of Canadian live cattle imports, which increased cattle price by \$6.42/cwt. The Canadian effect was relatively large because of its relatively large contribution in reducing U.S. commercial cattle slaughter.

Increasing consumer beef demand (as measured by the LMIC beef demand index) was the third leading cause of the 2003 price increase, adding about \$3.00/cwt to fed cattle price. Though not statistically verified, it is thought that several factors have contributed to the demand increase since 1998, including beef product promotion, beef product development (convenience foods), improved public perception of beef health attributes, and high protein diets (i.e., the Atkins diet). Declines in average slaughter weights, due to accelerated fed cattle marketings, was the fourth leading factor. This factor increased fed price by \$2.04/cwt.

Changes in prices of beef by-products affect meat packer price bids for slaughter cattle since by-products are crucial for covering packer profit margins. The increase in the value of by-products added \$1.67/cwt to fed cattle price, the fifth leading factor in affecting fed price. The last two factors were decreases in net beef imports from Canada and from other countries, which increased fed cattle price by \$0.45/cwt and \$0.08/cwt, respectively. The relatively small effect of these variables reflects two factors. First, *net* beef imports from *all* countries constitute only about 4% of U.S. beef supplies, and second, net beef imports more directly impact the wholesale-retail level of the market.

Summing up the estimated changes in fed cattle price gives a total price increase of \$21.49/cwt. When added to the October-to-October average price of \$83.35/cwt, this pushes fed steer price to nearly \$105.00/cwt, which is within the range of weekly fed prices in October 2003 reported by the LMIC.

Prices in the feeder cattle market logically followed the price increases in the fed cattle market. Feeder cattle prices were also supported by about \$2.00/cwt due to a 14% decline in corn price (from \$2.41/bu in October 2002 to \$2.08/bu in October 2003). Feeder cattle prices, however, did not increase as much on a percentage basis as fed cattle prices. This may have been due to low net cattle feeding margins in the fourth quarter of 2002 (about \$3.00 per head) and uncertainty by cattle finishers about the permanency of high fed cattle prices.

U.S. BSE Outbreak

This study did not account for the December 23, 2003 report of BSE in the state of Washington. Within a few days after the announcement, cattle futures and cash prices for fed cattle declined by 15-20 percent, i.e., cash fed cattle prices fell from about \$92/cwt to about \$75/cwt. Most of the decline was due to the United States quickly losing 90 percent of its beef export market (the U.S. exports about 10 percent of its beef supplies) and market uncertainty. As of early March, however, cash fed cattle prices in the Southern Plains had increased to \$84-\$86/cwt, temporarily reflecting increasing wholesale beef sales and boxed beef prices.

Conclusions

The analysis indicates that, of the variables measured, 78% of the increase in October 2002-to-October 2003 fed cattle prices was supply related. This included decreases in domestic cattle slaughter, Canadian cattle imports, net beef imports, and average slaughter weights. Increased consumer demand for beef accounted for 14% of the fed price increase while increased by-product values accounted for 8% of the price increase.

In the period studied, percentage increases in retail beef prices did not match those in the live cattle and wholesale beef markets. Perhaps retailers expected consumer resistance to a complete pass through of wholesale beef prices due to relatively cheaper poultry and pork meats. Some consumer

resistance may have occurred, as wholesale beef prices substantially decreased from their high level of about \$201.00/cwt in mid October to about \$158.00/cwt in mid December.

Prior to the BSE outbreak in the U.S., market analysts predicted that the next two to three years would have maintained high nominal U.S. cattle prices. However, U.S. beef producers now potentially face a more volatile market due to the uncertainty of foreign markets, domestic consumer behavior, and the effectiveness of U.S. safeguards in preventing BSE contamination of beef supplies.

Beef price recovery from the current crisis hinges upon two major areas. One is the restoration of U.S. beef export markets, particularly the major markets of Japan, South Korea, and Mexico. This involves assuring foreign buyers about the safety of U.S. beef supplies, which is contingent upon non contaminated feed supplies, U.S. meat processing methods, U.S testing programs for BSE, and a national cattle ID system. Another is that the safeguards must maintain domestic consumer confidence in U.S. beef supplies. The foreign market recovery for U.S. beef could get entangled with other commodity issues in trade.