



# BRIEFING

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## Impacts on U.S. Cattle Producers From Changes in Retail Beef Demand

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### Objective

### Analysis

### for Informed

### Decision Making

Since the mid 1970s U.S. beef producers have faced persistent declines in the domestic demand for beef products. The consequences at the farm level have been reductions in real (inflation adjusted) cattle prices and cattle inventories. From 1976 to 2001, real slaughter steer price (Nebraska direct) declined from \$69.05 to \$40.90/cwt (per hundred weight) and real feeder steer price (600-650 pounds, Oklahoma City) declined from \$68.52 to \$53.80/cwt. These were price declines of 41 percent and 21 percent, respectively. During this 1976 to 2001 period, the U.S. beef cow inventory declined by 24 percent from 43.9 million head to 33.4 million head.

Feeder cattle prices and beef cow inventories from 1970 to 2001 are shown (Figure 1). The beef breeding herd is subject to cyclical fluctuations—the cattle cycle. The downward *trend* in beef cow numbers is attributed primarily to declining real returns to cow-calf producers as real feeder cattle prices declined.

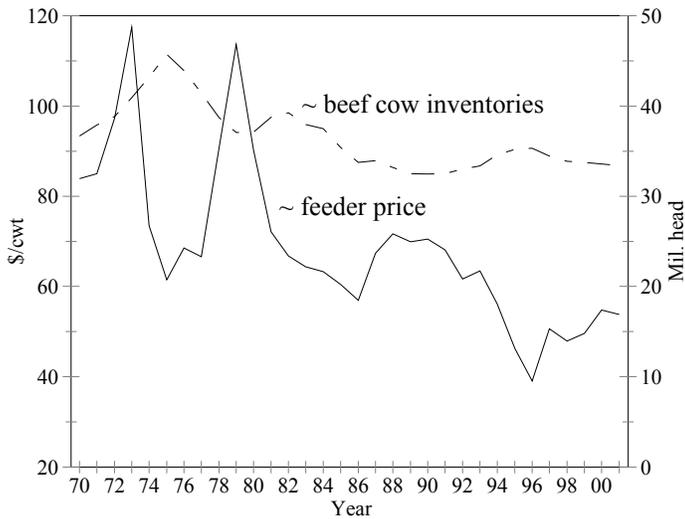
### Beef Demand Changes

From an economic standpoint the decline in retail (consumer) beef demand implies reductions in real retail beef prices and per capita beef consumption. Retail beef prices and per capita consumption declined by 26 percent and 28 percent, respectively, from 1976 to 2001. A commonly used measure to represent changes (shifts) in consumer beef demand is the choice retail beef demand index. The beef

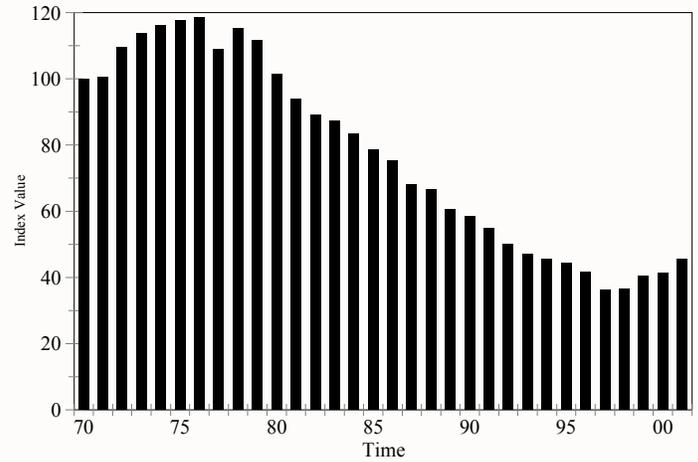
demand index for the years 1970 to 2001, with 1970 as the base year, is shown in (Figure 2). The index reveals that beef demand increased by 19 percent from 1970 to 1976, decreased by 69 percent from 1976 to 1997, and increased again from 1998 to 2001 by about 25 percent. Overall, from 1970 to 2001 beef demand decreased by about 54 percent. During this period, per capita retail pork demand remained relatively unchanged while per capita retail poultry demand increased.

Beef's share of red meat and poultry consumption (beef, pork, lamb, and poultry) decreased from 44 percent to 32 percent over the 1970 to 2001 period while that of poultry increased from 25 percent to 44 percent. The beef industry is concerned about this loss of market share and has attempted to reverse the down trend through beef promotion and product development, food safety, strategic allowances, and breeding genetics.

Several reasons exist for the long-term decline in domestic beef demand. These include relatively lower prices of beef substitutes (pork and poultry), changing demographics (older population and increased minority population), and changes in consumer tastes and preferences. Consumer tastes and preferences have been affected by health issues (i.e., cholesterol), food safety problems (i.e., E-coli), and inconsistent product quality. On the other hand, the decline in domestic



**Figure 1: Real Feeder Steer Price and Beef Cow Inventories, 1970-2001**



**Figure 2: Retail Beef Demand Index (1970 = 100.0 1970-2001)**

beef demand has been accompanied by increased foreign demand (primarily that of Japan, Mexico, Canada, and South Korea) for the U.S. beef products. U.S. beef exports as a percentage of U.S. beef supplies increased from less than one-half percent in 1976 to about 8 percent in 2001. Much of this growth is due to increased per capita incomes in the importing countries, reduced trade barriers, and consumer preferences for animal-source proteins.

Economists have also identified other factors responsible for declining real cattle prices. An important factor has been increased pork and poultry (competitive meat) supplies, increasing by nearly 127 percent from 1970 to 2001. Technological changes in breeding genetics and animal health and nutrition have also played a role in reducing prices through production efficiencies reflected by increasing calving percentages, weaning weights, and the average weights of slaughter cattle. Declining real feed costs led to increased average slaughter weights. Increased market concentration in the meat packing industry and increased live cattle and beef imports have also been argued to decrease beef prices. Research indicates that packer concentration and beef imports have had minimal adverse effects on beef prices.

### Retail Demand Effects

Economic theory suggests that prices meat packers for live cattle in competitive markets depend upon retail beef prices and packer-retailer marketing costs for given levels of cattle and meat marketed. Slaughter cattle prices depend upon changes in retail (meat) demand, factors that affect marketing margins such as transportation, processing and storage costs, and other factors specific to the meat packing industry. These other factors include excess capacity, captive supplies, packer competition, and technology of meat packing plants. Changes in one or more of these factors can affect packer price bids. For example, increased meat packer processing costs or fewer packer buyers in livestock markets might lead to less aggressive bidding and reduced cattle prices.

Between 1993 and 1998 real slaughter and feeder cattle prices experienced a decline of about 27 percent. Some economists and beef producers attributed this decline to increased live cattle and beef imports and large market concentration in the beef packing industry. During this period the U.S. beef trade deficit (live cattle and meat) with Canada had substantially increased as imports continued to grow faster than exports,

and the four-firm beef packer concentration ratio (percent of boxed beef sales by the four largest firms) had reached 80 percent. But during this period dressed weights of cattle had also reached record highs. The additional beef tonnage from increased weights combined with the continued drop in domestic beef demand were deemed by many market analysts to be more important in causing the price declines. The domestic demand problem for beef has long been acknowledged as crucial, but its quantitative impact on the live cattle market had not been established.

### Retail Demand and the Producer Level

Recent research has quantified the effects of the long-term decline in consumer beef demand on farm beef prices and production (Marsh 2003). An econometric model using 1970 to 1999 data measured the effects of retail beef demand and demand and supply factors in the slaughter and feeder cattle markets on farm prices and production. Farm prices considered were slaughter and feeder cattle prices.

Production encompassed feeder cattle supplies and slaughter cattle marketings.

The model results indicate that changes in consumer demand for beef products result in positively correlated changes in prices of slaughter and feeder cattle. That is, when consumer beef demand increased, retail market signals are passed on to meat packers and cattle finishers who demand more cattle and pay higher prices. These cattle price responses occur within a year. The model results suggest the retail grocers and meat packers do not automatically set high margins at the expense of producers even though the retail grocery and meat packing industries are highly concentrated. The model coefficients estimated that a 1 percent increase (decrease) slaughter cattle price by 0.60 percent and feeder cattle price by 0.72 percent.

The size of the percentage transfers from retail demand to farm-level prices reflect several factors. They include marketing costs and the nature of the marketing margin, different demand and supply conditions at the retail and farm levels, and different levels of market concentration within the segments of the marketing channel.

### **Effects of Declining Retail Beef Demand**

The effects of changes in consumer beef demand on livestock producers are not trivial when considering the historical decline in beef demand. The retail beef demand index indicates that beef retail demand declined by 65.9 percent from 1976 to 1999 (Figure 2). Other factors constant, what did this retail demand decline imply for cattle producers? Results indicate, with no allowance for cattle supply changes, that real slaughter cattle price declined by 39.8 percent and real feeder cattle price declined by 47.7 percent. Based on respective real slaughter and feeder

cattle prices of \$69.05 and \$68.52/cwt in 1976, the decrease in retail demand resulted in declines in retail demand resulted in declines of \$27.48/cwt for slaughter price and \$32.68/cwt for feeder price.

Economic logic suggests that changes in retail beef demand should result in long-term changes in both cattle prices and supplies. The estimated price declines given above would be less than reported when allowances are incorporated to reflect declines in livestock supplies. When livestock prices decline, reduced profitability in cow-calf production and cattle finishing reduces feeder supplies and slaughter cattle marketings. Reduced feeder and slaughter cattle supplies, would in turn, increase prices.

When the model allows for livestock supply responses, the decline in retail beef demand from 1976 to 1999 resulted in net decreases in slaughter and feeder cattle prices of 32.1 percent and 8.0 percent, respectively. Likewise, slaughter cattle and feeder cattle supplies declined by 11.2 percent and 22.6 percent, respectively. Respective slaughter and feeder cattle supplies in 1996 were 42.7 and 39.0 million head. Therefore, based on 1976 livestock prices, quantities, and allowances for livestock supply response; real slaughter and feeder prices decreased by \$22.17 and \$5.48/cwt, respectively, and slaughter and feeder cattle supplies declined by 4.8 and 9.7 million head.

In the context of producer incomes, the retail demand decrease resulted in real gross reductions of about \$9.6 billion for slaughter cattle producers and \$3.7 billion for cow-calf producers and \$3.7 billion for cow-calf producers over the 1976 to 1999 year period. This \$13.3 billion reduction in producer revenues, due to the retail demand decline, represented about 61 percent of the total reduction in real gross livestock revenues for this period.

Changes in retail beef demand also affect cattle feeding margins because of resulting relative changes in output (fed cattle) and input (feeder cattle) prices in cattle finishing.

The cattle feeding margin of a feedlot operation is defined as revenue per slaughter animal sold less cost per feeder animal purchased. The difference pays the feedlot cost of gain. In 1976, the real cattle feeding margin was about \$314 per head. With the retail demand decrease, the model coefficients indicated fed cattle price decreased relatively more than feeder cattle price. As a result, the decline in retail beef demand caused a reduction in the real feeding margin of \$161 per head, or about 51 percent. During this period, however, the real feed cost of weight gain generally decreased due to the decline in the real price of corn.

Estimates of the decline in producer gross revenues and cattle feeding margins above emphasize there would be substantial income benefits to beef producers from stabilizing increasing the consumer demand for beef products.

### **Conclusions**

Beef research and promotion programs such as those funded under the Beef Checkoff Program focus on enhancing consumer beef demand. Research indicates benefits of increasing consumer beef demand are not fully captured exclusively by large processors and retailers through inflated margins. There is a distribution of income gains between processors of slaughter and feeder cattle.

From 1998 to 2000 the retail beef demand index reported by the Livestock Marketing Information Center (LMIC) increased by 6.0 percent. Estimates based on this research suggest a 6 percent demand shift would translate into increased consumer beef spending of \$2,160 million. The processing and retailing

sectors would receive \$1,248 million, or 58 percent, of this increased spending of beef. The slaughter cattle sector would receive \$643 million, or 30 percent, and the feeder cattle sector would receive \$270 million, or 12 percent, of the consumer spending increase. Slaughter and feeder cattle producers

would collectively receive about 42 percent of the increased retail spending on beef.

## Reference

Marsh, J.M. "Impacts of Declining U.S. Retail Beef Demand on Farm-Level Beef Prices and Production." *American Journal of Agricultural Economics* (in press 2003).



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