

Managing for Today's Cattle Market and Beyond

March 2002

Focus on Beef Demand

By

James Mintert, Kansas State University

Ted Schroeder, Kansas State University

Tom Marsh, Kansas State University

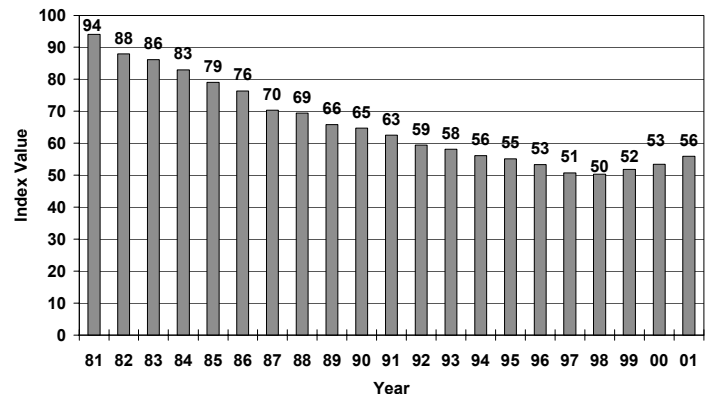
Consumer demand for beef increased modestly during 1999, 2000, and 2001, which generated considerable interest in the cattle industry. The recent demand rebound came on the heels of essentially 20 years of declining beef demand. The decline in demand was apparent as inflation-adjusted retail beef prices and per capita consumption fell. Despite the recent demand recovery, beef demand today is still substantially lower than it was in 1980. For example, the beef demand index indicates 2001 Choice retail beef prices were approximately 44 percent lower than if beef demand was at its 1980 level (Figure 1). To sustain the recent recovery, the beef industry needs to examine in detail what undermined beef demand during the 1980s and 1990s and address the problems identified. This fact sheet discusses results of a comprehensive meat demand study designed to determine major factors that caused beef demand to shift down during much of the last two decades.

Defining Beef Demand

One challenge facing the beef industry is a poor understanding of beef demand and its determinants. Part of the problem is confusion over terminology. Economists differentiate between two related, but distinctly different, terms; 1) quantity demanded and 2) demand. A meaningful discussion of beef demand requires a clear distinction between these two terms.

Quantity demanded refers specifically to the quantity of beef consumers will purchase at a given beef price, holding all other factors constant. On the other hand, demand, also referred to as a demand curve, is a schedule of beef quantities consumers will purchase over a range of beef prices.

Figure 1. Retail Choice Beef Demand Index



Source: USDA, Dept. of Commerce & K-State Research & Extension
Price Deflated By CPI, 1980 = 100 for Beef Demand Index

A shift in beef demand occurs when the entire beef demand curve shifts up (demand increase) or down (demand decrease). Changes in beef price or the quantity of beef consumed do not cause the beef demand curve to shift. Rather, changes in other factors, such as prices of competing meats (e.g., pork or poultry), demographics (e.g., income, age distribution, etc.), or health or food safety concerns cause the beef demand curve to shift. When beef demand increases (i.e., shifts up), say as a result of an

increase in the price of poultry that causes consumers to substitute beef for poultry, the result is higher beef prices at any level of beef consumption than prior to the demand shift. Conversely, when beef demand decreases (i.e., shifts down) beef prices are lower at any beef consumption level than prior to the demand shift.

Because there is considerable confusion surrounding demand, it is useful to stipulate what beef demand is not. Beef demand is not per capita beef consumption. Per capita consumption is beef production (net of changes in cold storage, imports, and exports) divided by population. Observing per capita consumption over time without consideration of price provides little information regarding beef demand. Beef demand is not beef's relative share of total meat consumption. This share concept simply reflects production of beef relative to production of competing meats and does not include information regarding prices. Finally, beef demand is not the share of consumer income spent on beef. Consumer income level affects beef demand, but changes in the share of consumer income spent on beef do not provide a measure of whether beef demand is increasing or decreasing since changes in income alone can cause changes in the share of consumer income spent on beef, even if beef demand remains unchanged.

Since many beef demand determinants, as well as beef production, change at the same time, it is impossible to accurately assign relative demand shifts to individual demand determinants through casual observation of trends and beef demand shifts. As a result, a meat demand system was estimated using quarterly time series data over the 1982 to 1998 period. The system included factors accounting for prices of competing meats and total consumer expenditures, changing consumer demographics, food safety problems, health information, and seasonality. The impacts of individual demand determinants on beef demand were calculated each year from 1992 through 1998.

Beef Demand Model Results

Model results indicate beef demand is inelastic with respect to beef price and that pork and poultry are weak substitutes for beef. Over 1982 to 1998, on average, beef quantity demanded declined 0.61 percent given a 1 percent increase in beef price. Responses to competing meat price changes were

much smaller as beef quantity demanded increased 0.04 percent and 0.02 percent, given a 1 percent increase in retail pork and poultry prices, respectively. These elasticity estimates indicate relative prices matter, however, per capita beef consumption was not highly responsive to changes in pork and poultry prices. Moreover, beef expenditures represent a progressively smaller proportion of total consumer expenditures. This implies beef demand will become even more inelastic (i.e., quantity demanded will be less responsive to price changes) in the future. This result, taken together with findings from other consumer research indicates many consumers are willing to pay for a high quality product (i.e., price is less of an issue if quality is high). As a result, consideration should be given to devoting resources to research focusing on quality (especially tenderness) measurement. Making it easier for consumers to select the quality product they desire will encourage consumers to buy beef.

Expenditures Impact On Beef Demand

Beef demand was highly responsive to changes in total per capita expenditures on all goods. Changes in total per capita expenditures occur when personal disposable income increases, consumer willingness to spend income increases, or a combination of the two. Consumer willingness to spend a larger proportion of total income has been an important source of economic growth for the U.S. economy in recent years. For example, consumer expenditures rose from less than 90 percent of disposable income in the early 1980s to near 98 percent by 1999. Demand model results indicate beef demand increases 0.90 percent for a 1 percent increase in total per capita expenditures. This means beef demand was a major beneficiary of increasing consumer expenditures, but if consumers choose to increase savings in the future (in lieu of consumption), or if disposable income declines, it will have a negative impact on beef demand.

Food Safety Recalls Impact On Beef Demand

Beef demand declined when beef food safety recalls occurred. Beef recalls averaged 2.1 per quarter from 1982 to 1998, but the number of recalls varied across quarters and years. For example, beef recalls ranged from 4 to 8 per quarter during 1998. Over the 1982-1998 period the number of Food Safety

Inspection Service (FSIS) recalls were relatively few in number and their impact on beef demand was generally small. But the demand model results indicate a large increase in beef recalls leads to a significant downward beef demand shift. The beef industry cannot afford to be passive and simply react to food safety problems after they occur. Rather, the industry needs a proactive food safety program to minimize the negative impact on beef demand associated with FSIS recalls.

Health Information Impact

Health information linking cholesterol and heart disease weakened beef demand, from 1982 through 1998, by an average of about 0.60 percent annually. As more articles are published supporting the linkage between cholesterol and heart disease, beef demand declined modestly, whereas pork and poultry demand actually increase. Importantly, the negative impact of health information on beef demand increased over the study period.

There are several implications to be derived from the linkage between articles that publicize heart disease risk and cholesterol and their subsequent negative impact on beef demand. First, dietary guidelines for consumers on cholesterol restricted diets that include beef need to be broadly disseminated. This type of program has already been developed with beef checkoff funding and these results suggest it should continue. Second, additional research that clarifies the heart disease - cholesterol relationship by cholesterol type, and dissemination of these research results within the medical community and among consumers, could also prove helpful. Finally, the industry must produce healthy, nutritious beef products to keep consumers satisfied

Changing Consumer Demographics

Changing demographics suggested consumers placed more emphasis on how quickly meat items can be prepared for consumption. The percentage of females in the labor force rose from 52 percent in 1982 to 60 percent in 1998. As a greater proportion of females enter the labor force, less time is available for at home food preparation. Declining time available for food preparation had a negative effect on beef demand, but a positive effect on poultry demand. Beef demand declined an average of 1.3 percent annually over the 1992-98 period as a result

of increasing female labor force participation. Assuming consumer demand for convenience is related to female labor force participation, these results indicate the poultry sector benefited over time by offering more convenient products to consumers. At the same time, beef demand suffered as time allocated for food preparation declined and the beef industry failed to offer consumers high quality, convenient, easy-to-prepare beef products.

The lessons for the beef industry are two-fold. First, it confirms the need for the beef industry to commit resources to research and development of innovative, consumer friendly, easy to prepare beef items suitable for sale in supermarkets. Recent new product development successes reinforce the value of devoting beef checkoff funds to product development research. Second, the industry must recognize that as consumers place higher and higher values on their time, demand for food consumed away from home will increase. This means new product development should also target products consumers purchase in a wide variety of dining establishments, ranging from low-priced fast food restaurants to high-priced white table cloth establishments.

What's Behind The Recent Beef Demand Recovery

Beef demand showed signs of strengthening in late 1998 1999, 2000, and 2001. The beef demand index, which is a ratio of the actual inflation-adjusted Choice retail beef price and the price that would have occurred if beef demand held constant at its 1980 level (multiplied by 100), helps illustrate the magnitude of demand changes over time. During 1998, the beef demand index bottomed out at 50, indicating inflation adjusted prices were 50 percent lower than they would have been if demand held constant at its 1980 level. During 1999, 2000, and 2001 the index value increased 3, 3.2 and 4.6%, respectively. Cumulatively, these modest increases brought beef demand in 2001 back to the level observed in 1995, still 44 percent below the 1980 level.

Although it is not clear exactly what drove the recent improvement in beef demand, some inferences can be drawn. First, changes in competing meat prices since 1998 do not explain the demand shift. If all else is held constant, an increase in inflation-adjusted competing meat prices would lead to an increase in beef demand as consumers would shift

their consumption away from relatively higher priced competing meats towards relatively lower priced beef. But from 1998 to 2001 inflation-adjusted broiler prices declined 5.5 percent. Retail pork and turkey prices increased just 2.2 and 1.5 percent, respectively, so most of the beef demand increase was not attributable to changes in competing meat prices.

Second, growth in the U.S. economy contributed to the improvement in beef demand. Inflation-adjusted per capita disposable personal income grew by about 3.7 percent from 1998 to 2001. Demand model results indicate that consumer income is an important determinant of beef demand. So, the rise in income contributed to the beef demand increase.

Third, consumer acceptance of new beef products in the marketplace might explain some of the recent beef demand turnaround. To date, the gain from new product development is likely small, but increasing. Many of the new beef products are derived from round, chuck, and shoulder clod cuts. So, one way to assess whether new product offerings have had a significant impact on beef demand is to examine these wholesale cut prices relative to USDA's light Choice cutout value. Examining these ratios provides some information regarding demand for individual cuts relative to a composite beef price.

Round prices weakened, relative to the cutout, during most of the 1990's. The ratio of top round prices to the light Choice cutout value declined from an average of 1.39 in 1990 to 1.19 in 1997 (Figure 2). Similarly, the ratio of bottom round prices to the cutout value averaged 1.21 in 1990, but was only 1.02 by 1997. However, the declines in both the top and bottom round ratios apparently came to a halt during 1998-2001 (Figure 3). One possible explanation for the apparent turnaround in these wholesale cut values is the addition of new product offerings that utilize these cuts. So, it appears that offering new, consumer friendly beef products has had a positive impact on beef demand, but it has been modest so far and likely explains only a portion of the observed beef demand increase.

Another factor that likely contributed to the beef demand recovery during recent years was an apparent stabilization in the percentage of women employed outside the home. During the 1980's and most of the 1990's, an increasing percentage of women joined the U.S. labor force. This long-term change in consumer demographics likely increased

consumer demand for convenience, which benefited poultry demand and contributed to beef's long-term demand decline. However, the rate of growth in female employment outside the home slowed during 1999-2000.

Finally, it's worth noting that many of the other factors that had a negative impact on beef demand during the 1980s and 1990s, such as consumer concerns about food safety and health information, continued to have a negative effect on beef demand during 1999-2001. The fact that beef demand was able to strengthen despite the presence of these negatives suggests some consumers' preferences may have shifted away from other food products toward beef.

Figure 2. Top Round #168 to Light Choice Cutout Price Ratio, Weekly 1990-1998

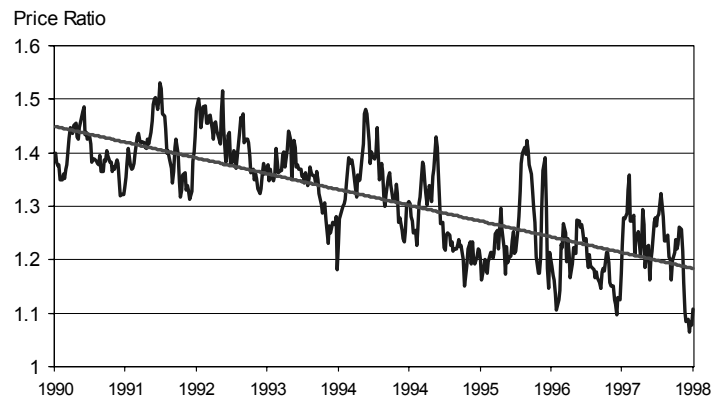


Figure 3. Top Round #168 to Light Choice Cutout Price Ratio, Weekly 1999-2001

