U.S. Beef Demand Drivers and Enhancement Opportunities: A Research Summary

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Large shifts in domestic beef demand have had substantial impacts on the beef industry. Before the late 1970s, growth in the U.S. economy and rising consumer incomes contributed to beef demand increasing for a sustained period. In response to growing product demand, the beef industry increased in size. However, starting about 1980, domestic retail beef demand weakened and subsequently declined every year through 1998. The long-run decline in retail beef demand contributed to a reduction in cattle industry size, particularly in relation to competing meat sectors such as poultry and pork. In 1999, following nearly 20 consecutive years of decline, domestic beef demand began to strengthen. From the late 1990s through 2004, the all fresh domestic retail beef demand index increased from a low of 76 to a peak of 92, before weakening again from 2005 through 2008.

Designing programs to increase domestic retail beef demand requires a comprehensive understanding of the many underlying factors that caused beef demand to decline precipitously during the 1980s and 1990s. Likewise, it is important to determine what caused recent beef demand increases from the late 1990s through the middle part of this decade. Increasing consumer demand for beef requires concerted effort by all vertical segments of the production, processing, and marketing chain as there are myriad opportunities to improve product quality, food safety, and diversity of product offerings. How the industry collectively responds to these challenges will ultimately determine the success or failure of demand enhancement initiatives.

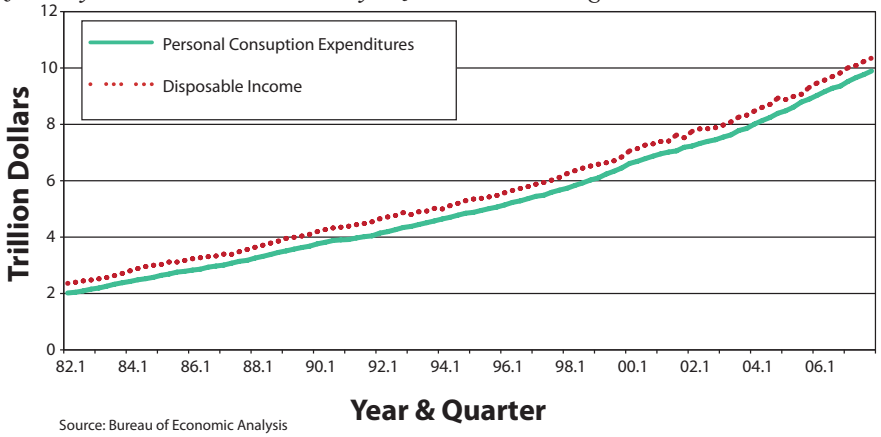
The purpose of this study was to provide a comprehensive and updated assessment of factors influencing U.S. consumer demand for beef. To assess the relative impact various factors have on beef demand, a demand model was built to estimate the impacts of beef, competing meat, and other goods prices; consumer expenditures; published information on food safety, health and nutrition information related to meat consumption; female labor force participation; and expenditures on food consumed away from home. Quarterly data from 1982 through 2007 were used to estimate the model. Estimates obtained from the model provide measures of expected impacts from changes in each of the demand drivers. This fact sheet focuses on the impact of key demand drivers on U.S. consumer demand for beef and what these results mean for the U.S. beef industry.

Consumer Income and Expenditures

Consumer income increased steadily from the early 1980s through 2007, averaging about 6 percent compound annual growth. Personal consumption expenditures grew even more rapidly than income during this time as consumers consistently reduced their personal savings rate (Figure 1). In the early 1980s, personal savings ranged from about 8 to 12 percent of disposable income, but the savings rate declined steadily and by 2007 averaged less than 1 percent. This is important because it reveals that consumers were allocating nearly all of their income to living expenses with little money left for savings by late 2007, just as the U.S. economy was entering a recession.

Demand model results reveal beef demand is very responsive to changes in consumer expenditures on goods and services. On average, a 1 percent increase in U.S. consumer total expenditures results in a 0.9 percent increase in the quantity of beef demanded. Results indicate that from 1982 through 2007, beef demand benefitted from increases in consumer incomes and from consumer willingness to increase consumption expenditures even more rapidly than income was increasing. In other words, the beef demand decline experienced from 1980 through 1998 would have been even more severe if incomes were not growing and consumers were not reducing personal savings rates during this time.

Figure 1. *Personal Disposable Income vs. Personal Consumption Expenditures, Quarterly at Annual Rate, Seasonally Adjusted, 1982 through 2007.*



Source: Bureau of Economic Analysis

Looking ahead, weakness in the U.S. macroeconomic outlook for 2009 suggests that a decline in per capita consumer income can be expected. Moreover, the impact of weaker consumer income is expected to be compounded by consumers' desire to increase savings in response to uncertainty and risk present in the financial and real estate markets. An increase in consumer savings means consumption expenditures will decline even more rapidly than income and, given the importance of consumer expenditures, a decline in U.S. retail beef demand is likely during 2009. Longer term, it is unlikely that domestic beef demand will rebound until the U.S. economy strengthens and consumers regain enough confidence to spend more of their income. Since the beef industry can do little to dampen the industry-wide effect of this macroeconomic demand determinant, it will be important to focus resources in areas where noticeable impacts are possible.

Price Effects

U.S. consumer demand for beef is inelastic with respect to changes in beef price. On average, from 1982 through 2007, a 1 percent increase in beef price resulted in a 0.4 percent decline in the quantity of beef demanded by consumers. As expected, beef consumption was much less responsive to changes in competing meat prices than to beef prices. This means that, although price is integral to attracting consumers to purchase beef, small price increases or declines by themselves have small discernable impacts on beef consumption. Beef expenditures represent a progressively smaller proportion of total consumer expenditures over time, which implies that beef demand will become even less responsive to price changes in the future.

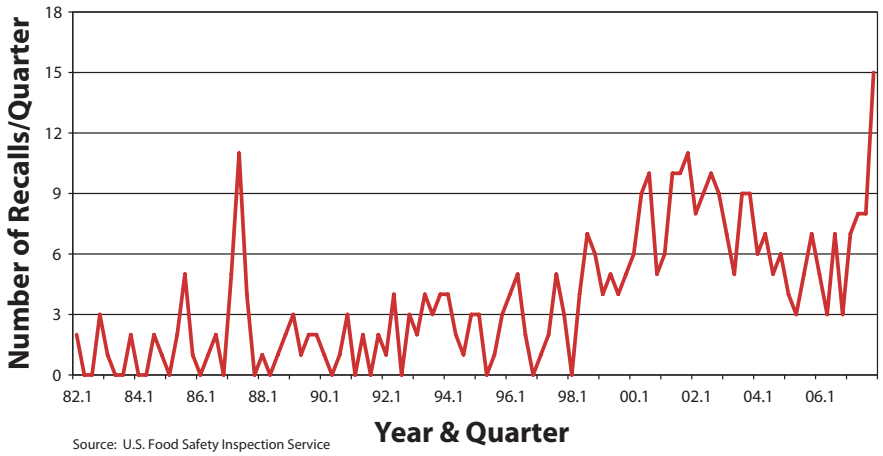
Since consumer demand for beef is inelastic with respect to beef price, the beef industry should focus attention on ensuring that consumers do not have nonprice reasons to shift away from beef consumption. One implication is that the industry should continue to strive to provide consumers with product attributes that consumers want. Results from this project, in conjunction with other research, confirm that consumers want consistently high quality beef products that are nutritious, flavorful, tender, safe, healthy, and convenient to prepare. Providing beef products meeting these characteristics is challenging. Furthermore, the dynamic nature of emerging nonprice demand determinants necessitates regular updates regarding factors influencing beef demand and ongoing efforts to identify and design effective industry strategies to increase consumer demand for beef.

Food Safety

Figure 2 documents the number of Food Safety Inspection Service beef recalls from 1982 through 2007. Beef food safety recalls averaged fewer than four per quarter during this period, but ranged from a low of zero to a peak of 15. When reviewing beef recall history, food safety recalls have exhibited a troubling upward trend in recent years. Not surprisingly, model results reveal food safety recalls adversely impact consumer demand for beef. For example, a 10 percent increase in beef recalls is associated with a 0.2 percent decline in beef demand. However, the impact of food safety recalls is most pronounced when recalls increase sharply. The recent rise in food safety recalls provides a good example of how food safety recalls can negatively impact domestic beef demand. Beef food safety recalls jumped from 18 in 2006 to 38 in 2007; this rise in recalls alone contributed to a 2.6 percent drop in retail beef demand.

Consumers expect food to be safe. When a food safety recall occurs, the food safety assurance system has failed. Responding to food safety recalls after the fact is inadequate because the damage to beef demand has already taken place. As the industry develops programs designed to improve beef demand, ensuring consumers have a safe supply of beef is critical to maintaining consumer confidence. Moreover, while the analysis focused on domestic demand, it is also important to recognize the need for high quality, safe beef production as a necessary condition for increasing beef exports. The beef industry has devoted considerable resources over the years to various food safety initiatives. The demand study results suggest a continuing need for proactive food safety efforts by the beef industry to avoid the negative impacts associated with food safety breaches. Because introduction of food safety hazards can occur at any stage, including production, processing, handling, and food preparation, ensuring a cooperative effort among vertical market participants is essential.

Figure 2. *Beef Food Safety Class I & II Recalls, Quarterly, 1982 through 2007.*



Source: U.S. Food Safety Inspection Service

Health and Nutrition Information

To examine the impact of consumer concerns regarding the healthiness of eating beef, several information indices were developed and included in the demand model. The first index focused on articles in medical journals that contained information relating diet and fat consumption to cholesterol, heart disease, or arteriosclerosis. Results reveal that as the number of articles focusing on this linkage increases, beef demand declines and demand for nonmeat food increases. The second index identified the number of net positive articles (e.g., positive articles minus negative articles) published regarding Atkins, high protein, or low carbohydrate diets. Beef demand responded positively to the publication of information promoting Atkins, high protein, or low carbohydrate diets. Beef demand declined when net negative information about low carbohydrate diets was disseminated. The third index counted the number of articles published in medical journals regarding health benefits associated with having zinc, iron, or protein in diets. Both beef and poultry demand benefit from increasing published information regarding health benefits associated with zinc, iron, or protein in diets.

Assessing the influence of evolving public health information on beef demand requires consideration of both elasticity estimates and the magnitude of changes in the respective factors. Results indicate that consumers change consumption in response to evolving information regarding healthiness of eating beef. For instance, the number of medical journal articles published linking fat in the diet with cholesterol and heart disease nearly quadrupled from 1982 through 2004 (Figure 3). Beef demand declined about 9 percent because of this influx of information linking fat in the diet to cholesterol and heart disease. Similarly, the 268 percent increase in the number of medical journal articles published noting the importance of zinc, iron, and protein from 1982 and 2007 boosted beef demand by about 7 percent, while also increasing poultry demand about 13 percent. Finally, the net number of articles promoting low carbohydrate diets increased by 245 percent from 1998 through 2003 and then declined precipitously after 2003. The media frenzy supporting low carbohydrate diets helped boost beef demand by nearly 2 percent from 1998 through 2003. However, the rapid shift from positive to negative information regarding low carbohydrate diets reduced beef demand by approximately 0.8 percent over the four-year period commencing with the fourth quarter of 2003.

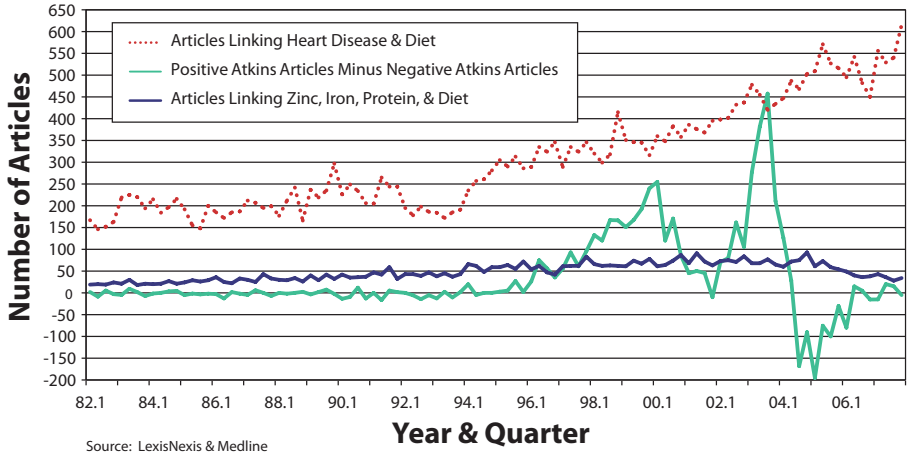
Overall, results from the three health-related indices confirm that consumers respond to information about impacts on human health associated with eating beef. For the industry, the implications are clear. First, conduct research that helps identify positive impacts derived from beef consumption. Second, these findings need to be presented to health professionals, nutritionists and, especially, consumers. Furthermore, investing in the development of new production or processing technologies that enhance beef's nutritional properties can be a source of future demand improvement.

Convenience

Direct measures of meat product preparation convenience at the industry level do not exist. Thus, two indirect measures, female employment outside the home and food consumed away from home, were used in the meat demand analysis. As the percentage of women employed outside the home increases, it is hypothesized that time available for in-home food preparation declines, thereby increasing consumer demand for products that can be prepared quickly and easily. The percentage of women employed outside the home increased from the early 1980s when it was around 53 percent to about 60 percent in the late 1990s, where it remained through 2007. Food consumed away from home was viewed as a proxy for consumer demand for convenience since consumers often consume food away from home because it eliminates in-home meal preparation time. Food consumed away from home increased from less than 41 percent in the early 1980s to more than 47 percent by 2006.

Model results reveal that as female employment outside the home and food consumed away from home increases, beef demand decreases. On average, from 1982 through 2007, a 1 percent increase in female employment resulted in a 0.6 percent decline in beef quantity demanded by consumers. Conversely, poultry demand increased about 0.6 percent when female employment increased by 1 percent. During the study period, a 1 percent increase

Figure 3. *Media Indices Linking Diet and Health, Quarterly, 1982 through 2007.*



Source: LexisNexis & Medline

in food consumed away from home resulted in a 1.6 percent decline in the quantity of beef demanded by consumers, whereas pork and poultry demand benefitted as consumers shifted toward consuming more food away from home.

As consumer demand for products that are convenient to prepare increases, beef demand suffers, whereas poultry and pork demand benefit. The differential impact on beef versus competing meats demand could be related to differences in the pace of new product introductions. For example, a search of Mintel's Global New Product Database from 1997 to 2008 containing the words Convenient, Microwaveable, Ease of Use or other time-saving claims identified 5,633 new poultry products, but just 3,579 new beef products. To address this issue, the industry needs additional resources devoted to new beef product development. Product development efforts should focus both on new beef products adapted for use in the food service market and products well suited for featuring in supermarkets.

Conclusions

A long-run goal of the beef industry is to increase consumer demand for beef. To increase beef demand, it is important to understand the key demand drivers and then design programs that directly address those factors. Results from a comprehensive meat demand modeling exercise revealed that U.S. consumer demand for beef is influenced by many traditional demand factors, including consumer expenditures and prices for beef and competing goods. In addition, the analysis also identified several key nonprice demand drivers that can be broadly categorized under the umbrellas of food safety, health and nutrition, and convenience. Consumers respond to receipt of new information about beef including news about beef safety, the healthiness of eating beef, or nutritional benefits of beef consumption. U.S. consumers demand convenience in their food products. Developing and marketing convenient-to-prepare beef products that meet consumer nutrition, taste, and food safety needs will pay dividends for the beef industry.

Findings of this study also demonstrate the importance of directing industry efforts at multiple program areas. There is no "single" dominant beef demand driver that the industry should focus all of its attention on. On the contrary, consumer demand for beef is jointly determined by a number of factors. We recommend maintaining a portfolio of beef demand enhancement programs designed to address the key demand drivers identified in this study. In addition, because beef demand drivers are dynamic, on-going careful monitoring of changes in demand determinants is essential. Finally, and most importantly, because several integral beef demand determinants are influenced at every vertical segment in the beef production, processing, and marketing system, the collective efforts of all vertical market stakeholders throughout the industry are necessary to most effectively increase beef demand.

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www.agmanager.info

James Mintert
Professor
Dept. of Agricultural Economics
Kansas State University

Glynn Tonsor
Assistant Professor
Dept. of Ag., Food, and Resource Economics
Michigan State University

Ted Schroeder
Professor
Dept. of Agricultural Economics
Kansas State University

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