

CANADIAN BEEF DEMAND

This article is drawn from a study entitled “Canadian Beef Demand Elasticity Study – Final Report” by Dr. John Cranfield of the University of Guelph and funded by the Agriculture and Agri-Food Canada. The full report is available at <http://www.cattle.ca/cca-industry-analysis>

While supply is the main driver pushing cattle and beef prices higher in 2012, it is consumer demand that will determine how far prices will go. Demand is the combination of a consumer’s willingness to pay and ability to purchase a given quantity of a product at any given price. Lower beef supplies in 2012 suggest higher beef prices - holding all other factors constant. However, all other factors are seldom constant. Key to changes in demand are consumer tastes and preferences.

Numerous events and regulatory changes appear to have influenced consumer demand for Canadian beef over the last decade. While beef demand increased in 2003 following the discovery of BSE, as consumers supported the domestic beef industry, over the last decade it is expected that negative media attention and strong competition from other proteins has impacted how consumers respond to beef.

While a number of studies on beef demand have been published in the US few studies have been done in Canada. Current US studies have shown beef demand is becoming increasingly inelastic. And while the US and Canadian beef markets have historically been integrated, US demand studies cannot be expected to accurately reflect the Canadian market given barriers to trade and regulatory differences (i.e. disposal of long-list specified risk material in Canada). The importance of understanding the beef demand elasticity is underscored by changes in consumer perceptions and willingness to pay for different sources of protein. Rising grain prices are being passed through the supply chain to retail beef prices, where consumers’ response to higher prices makes it important to have updated meat demand elasticities in order to evaluate overall performance of the Canadian beef sector. Higher protein prices in general increase the consumers’ incentive to trade down within a protein, as well as trade down to alternative proteins depending on relative pricing.

This modeling was done in two stages reflecting consumer behavior. In the first stage, total expenditure is allocated to the commodity group of interest (i.e. protein) based on the price for that commodity group, the price of all other goods (i.e. other food, goods, etc.) and total disposable income. In the second stage, expenditure on the commodity group (i.e. protein) is then allocated to each good in that group based on the prices of goods in that group (i.e. beef, pork, poultry) and group expenditure. The study also took into consideration the potential impact of trending consumption, seasonality of meat demand, the 2003 BSE event, marketing investment by producers and demographic changes in meat demand.

The demand index represents overall consumer level demand for beef based on per capita consumption and real retail prices. This raises the question “What about foodservice product?” This is a legitimate question, as the index is based only on retail prices. The reason for this is twofold. First there is no data for the value of protein at foodservice that to our knowledge is publicly available. Second the retail price should be a shadow value of product sold through foodservice in that any increase in foodservice volume will reduce the volume available at retail and consequently push retail prices higher. Another challenge was that retail prices from Statistics Canada are available for a limited number of cuts. The price for each meat was calculated as a weighted average of prices corresponding to that meat category, with weights calculated to reflect the importance of those retail products in the consumer’s overall budget.

The Results

Stage 1: Meat Demand

Meat was found to be a normal good with a downward sloping demand curve. Demand for meat (beef, pork and poultry) in Canada was found to be inelastic at -0.24. So a 1% increase (decrease) in price would result in a 0.24% decrease (increase) in meat consumption. Cross elasticity with other good at -0.428 indicated a complementary relationship (i.e. as food consumption increases, meat consumption increases).

Stage 2: Conditional Compensated Price Elasticities

The conditional compensated own-price effects were negative reflecting the law of demand with consumption declining as prices increase. All cross-price effects indicated a net substitute relationship between the meats. So when pork or poultry prices get relatively high compared to beef, beef consumption will increase. And when beef prices get comparatively high, consumption will decline as consumers move to other protein options.

Beef demand was the most inelastic at -0.428 (i.e. had the smallest change in consumption from a price increase), followed by chicken at -0.490 and pork at -0.502 (a 1% change in price will result in a 0.502% change in consumption in the opposite direction).

Beef's own demand elasticity was plotted historically (1998-2010) ranging from -0.40 to -0.46. The elasticity had been trending more inelastic from 1998 to 2003, but became noticeably more elastic in third quarter 2003 and has shown little variation since. A more elastic demand results in a larger change in consumption from a 1% change in price, while a more inelastic demand results in a smaller change in consumption from a 1% change in price.

Beef, pork and chicken were all shown to be normal goods with respect to personal disposable income with income elasticities between zero and one. Beef and pork demand have income elasticities of around 0.54, so a 1% increase in income would result in a 0.54% increase in consumption. Meanwhile chicken is more income inelastic (i.e. a change in income will have a smaller impact on chicken consumption).

Canadian beef demand was shown to be more income inelastic and less responsive to changes in personal disposable income than US beef demand (Tonsor et al. 2011). Differences can stem from differences in methods used. It could also relate to fundamental differences in preferences and possibly a difference in the distribution of income that shifts beef closer to the limit between a normal and luxury good in the US, as compared to Canada.

Tonsor et al. (2011) reported US beef demand elasticity (unconditional, compensated) at -0.419, while this study showed Canada's beef demand elasticity to be -0.428. While different demand systems were estimated and different timeframes were used the similarities lends confidence in the results. Similar elasticities are not surprising given the large volume of trade that occurs in the Canadian and US beef markets.

Canadian Meat Demand

Since 1990 Canadian **beef** demand has ranged between 47 and 60 (Index 1980=100) while US beef demand has ranged between 45 and 58. Beef demand increased in both countries between 1998 and 2004 to reach levels seen in the early 1990s. Beef demand then declined from 2004 to 2010. Since 1994 Canadian demand has been stronger than in the US.

Pork demand increased from 1993 to 1998 but has been on a general decline since with a few notable exceptions in 2001/02 and 2004. A low of 55 in 2010 (Index 1980=100) is lower than what was seen in the early 1990s when demand bottomed at 64.

Chicken demand was relatively flat in the early 1980s before increasing steadily from 1983 to the late 1990s. Over the last decade chicken demand has stabilized and been relatively steady, making a small dip in the first half of the decade to bottom in 2006 before growing again until 2010.

