INTUITION AND CREATION DETAIL OF BEEF DEMAND INDICES

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Glynn T. Tonsor, Kansas State University,

Dept. of Ag. Economics, (785-532-1518; gtt@agecon.ksu.edu)

www.agmanager.info

This short document outlines creation of the beef demand index and provides a short explanation of the index's contribution to our understanding of beef industry economics. Before outlining details of the index itself a refresher on what constitutes demand is useful. A clear distinction between *quantity demanded* and *demand* is necessary to comprehend beef demand, determinants of demand changes, and more narrowly the beef demand index discussed herein. *Quantity demanded* is the quantity of product consumers will purchase at a given price when all other factors are held constant. *Demand* is a schedule of quantities consumers would purchase over a range of prices. Another way to make this distinction is to note *demand* refers to demand curves frequently presented by economists (i.e. graph with prices on a vertical axis and quantity on a horizontal axis) while *quantity demanded* refers to a single point (for a given price) on this demand curve. It is also worth noting beef demand is not per capita beef consumption. Per capita consumption is simply production (net volume of domestic production, cold storage adjustments, and international trade) divided by resident population and provides little information regarding beef demand when considered independently from prices.

The concept of the beef demand index refers to mapping out changes in *demand* rather than *quantity demanded*. In short the beef demand index measures vertical shifts in beef demand over time relative to a base year (i.e., 2000=100). One way to understand the index is to note creating the beef index involves calculating the real beef price which we would *expect* to observe if beef demand was consistent with that experienced in the base year. This *expected*, constant beef demand based real beef price is compared to the real beef price *actually transpiring* in the marketplace to indicate changes in underlying beef demand. For instance, a beef demand index value of 78 in 2009 (assuming a base year of 1990) suggests beef retail prices were 22% lower in 2009 than they would have been if beef demand was at its 1990 level. This example estimate of 22% quantifies the magnitude of demand reduction experienced since 1990.

To form the beef demand index we need information on beef consumption, nominal retail beef prices, consumer price indices for deflating nominal prices, and an assumed beef price elasticity estimate. To be transparent in how the index is created here we provide a summary of the sources underlying our creation of annual and quarterly beef demand indices:

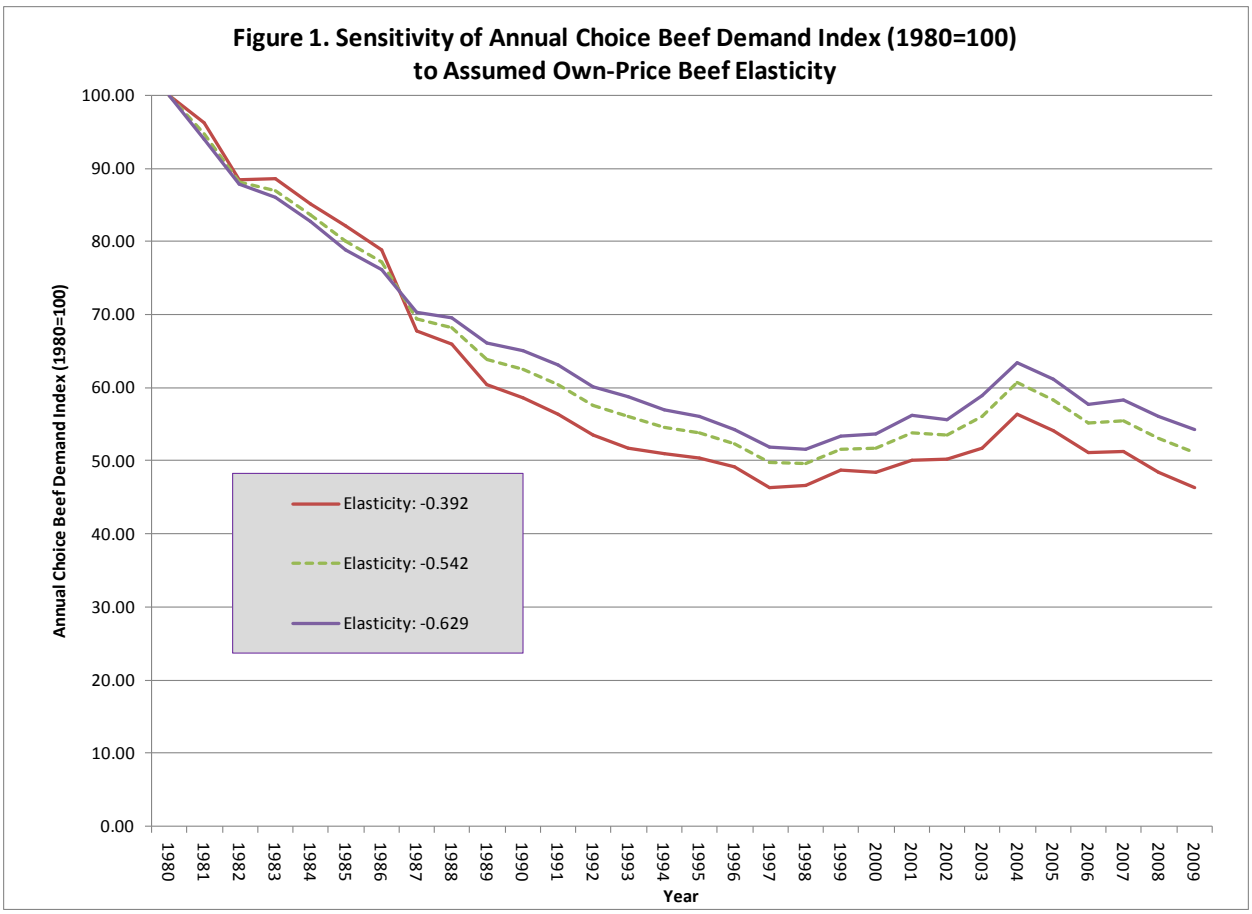
- Historical beef consumption (lbs/capita) is obtained from the Livestock Marketing Information Center ("SUMQ" spreadsheet).
- Nominal beef prices (cents/lb) are obtained from the Livestock Marketing Information Center ("RETMT" spreadsheet). More narrowly both a "Choice" and "All Fresh" price series is obtained resulting in two demand indices. Both indices are provided as industry practioners vary in which price series they prefer to follow.
- Consumer price indices (1982-1984=100) are obtained from the Livestock Marketing Information Center ("CPI: spreadsheet).
- Estimates of beef price elasticities are derived from recent journal articles. In particular the compensated, own-price beef elasticity estimates from Mutondo and Henneberry (2007), Tonsor, Minter, and Schroeder (2010), and Tonsor and Olynk (forthcoming) are averaged together yielding an estimate of -0.542 which is used in creating presented beef demand indices.

This last point regarding beef price elasticities warrants additional discussion. In particular, the academic literature contains a multitude of studies estimating own-price beef elasticities using a host of different methods and data sources. To be transparent in how the demand indices presented on AgManager's website are created we have noted three recent publications from which we derived our assumed elasticity. However, to demonstrate the inferences drawn from beef demand index changes over time are rather robust to this assumption we have included table 1 and figure 1. In particular, table 1 and figure 1 show how the annual choice beef demand index (1980=100) varies when the assumed elasticity is more and less elastic by 0.15 points compared to the assumed value of -0.542. One can readily observe inferences regarding changes in demand are robust to this sensitivity analysis example.

For further information on beef demand indices, particularly annual and quarterly estimates separately using choice and all fresh beef prices, please see www.agmanager.info.

Table 1. Annual Choice Retail Beef Demand Index (1980-2009) Under Alternative Elasticity Assumptions.

Assumed Elasticity:	**-0.392**	**-0.542**	**-0.692**
Year	1980=100	1980=100	1980=100
1980	100.00	100.00	100.00
1981	96.37	94.84	93.99
1982	88.53	88.14	87.92
1983	88.66	86.99	86.07
1984	85.25	83.72	82.88
1985	82.19	80.07	78.90
1986	78.98	77.23	76.27
1987	67.88	69.47	70.41
1988	66.07	68.25	69.55
1989	60.44	63.99	66.20
1990	58.70	62.61	65.09
1991	56.41	60.50	63.11
1992	53.63	57.62	60.17
1993	51.80	56.10	58.88
1994	51.00	54.66	56.99
1995	50.44	53.92	56.13
1996	49.21	52.38	54.38
1997	46.40	49.76	51.91
1998	46.68	49.73	51.65
1999	48.72	51.58	53.36
2000	48.48	51.74	53.79
2001	50.10	53.91	56.34
2002	50.20	53.58	55.71
2003	51.81	56.13	58.93
2004	56.41	60.72	63.49
2005	54.11	58.44	61.22
2006	51.24	55.24	57.82
2007	51.37	55.58	58.30
2008	48.50	53.13	56.18
2009	46.37	51.14	54.33



References

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