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Estimates and Interpretation of Income Elasticities of Demand for Food Products

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Cornhusker Economics

Cooperative Extension

Institute of Agriculture & Natural Resources
Department of Agricultural Economics
University of Nebraska – Lincoln

ESTIMATES AND INTERPRETATION OF INCOME ELASTICITIES OF DEMAND FOR FOOD PRODUCTS

Market Report	Yr Ago	4 Wks Ago	1/31/03
<u>Livestock and Products,</u>			
<u>Average Prices for Week Ending</u>			
Slaughter Steers, Ch. 204, 1100-1300 lb Omaha, cwt	\$69.75	\$74.65	\$77.54
Feeder Steers, Med. Frame, 600-650 lb Dodge City, KS, cwt	*	*	84.06
Feeder Steers, Med. Frame 600-650 lb, Nebraska Auction Wght. Avg	93.43	89.84	89.74
Carcass Price, Ch. 1-3, 550-700 lb Cent. US, Equiv. Index Value, cwt	107.67	112.61	119.44
Hogs, US 1-2, 220-230 lb Sioux Falls, SD, cwt	40.50	34.00	35.00
Feeder Pigs, US 1-2, 40-45 lb Sioux Falls, SD, hd	58.23	*	*
Vacuum Packed Pork Loins, Wholesale, 13-19 lb, 1/4" Trim, Cent. US, cwt	107.10	89.99	92.51
Slaughter Lambs, Ch. & Pr., 115-125 lb Sioux Falls, SD, cwt	65.40	83.50	*
Carcass Lambs, Ch. & Pr., 1-4, 55-65 lb FOB Midwest, cwt	131.92	164.66	166.60
<u>Crops,</u>			
<u>Cash Truck Prices for Date Shown</u>			
Wheat, No. 1, H.W. Omaha, bu	3.01	3.89	3.68
Corn, No. 2, Yellow Omaha, bu	1.87	2.24	2.29
Soybeans, No. 1, Yellow Omaha, bu	4.08	5.65	5.59
Grain Sorghum, No. 2, Yellow Kansas City, cwt	3.52	4.55	4.52
Oats, No. 2, Heavy Minneapolis, MN, bu	2.21	2.21	2.22
<u>Hay,</u>			
<u>First Day of Week Pile Prices</u>			
Alfalfa, Sm. Square, RFV 150 or better Platte Valley, ton	*	140.00	150.00
Alfalfa, Lg. Round, Good Northeast Nebraska, ton	65.00	80.00	80.00
Prairie, Sm. Square, Good Northeast Nebraska, ton	105.00	117.50	115.00
* No market.			

The income elasticity of demand for a product measures the responsiveness of demand for the product to a change in disposable (after tax) income. To get the measure, one divides the percentage change in demand for the product by the percentage change in income. For example, if the demand for butter fell by 2 percent when incomes rose by 5 percent, the income elasticity of demand for butter is -0.4 percent. If demand for butter went up by 5 percent, the income elasticity of demand would be 0.4 . If instead it went up by 2 percent, the income elasticity of demand is 1 . Most products have positive income elasticities of demand, meaning that as people become better off they buy more of it. Products that are consumed less as people become better off have negative income elasticities.

If we know that the income elasticity of demand for a product is larger than one, we can tell what happens to that product during economic booms and busts. Since incomes rise in times of a boom and decline in times of a slump, a product with an income elasticity larger than one will be popular during the boom and not so popular during a slump. The opposite is true for products with income elasticity of demand less than one. Here is a list of income elasticities of demand for some familiar products: automobiles, 2.56; furniture, 1.48; restaurant meals, 1.40; water, 1.02; electricity, 0.20; public transportation -0.36 .

As part of a larger project on growth in the food processing industry, we have recently estimated income elasticities of demand for products from 27 food industries. The industries are arranged in Table 1 according to the Census Bureau's Standard Industrial Classification (SIC) system. For example, meat pack-



ing (which includes beef, pork and lamb), is classified as SIC 2011, and so on. The third column lists the income elasticity for the product produced by that industry.

Here is what transpires from the estimates in the table: all of the 27 food products have income elasticities of less than one. So one should not expect those products to gain in popularity during boom times, or suffer significantly during slumps. Fifteen out of the 27 products have a negative income elasticity of demand. So, as incomes rise people consume less of these products, substituting more desirable/healthier products. The least responsive to a rise in income are cookies and crackers, followed by meat. The most responsive product in the bunch is frozen specialties with an income elasticity of 0.913. Products in the 0.80-.90 range include ice cream, distilled liquor and ice! Sausages and prepared meats are more responsive to rising incomes than poultry. Poultry is about as responsive to rising incomes as breakfast cereals. PICKLES, sauces and vegetable oil are the biggest losers when it comes to products that are consumed less as incomes rise.

So, being in the food processing business is a mixed blessing. Booms may pass you by, but slumps do not hurt you as much. Since demand at the processing level trickles down to the farm, it is not hard to guess what also happens at the farm. It is also not hard to guess what will happen to consumption patterns as incomes continue to rise over the long-term. The proportion of the consumer's budget will grow for products with positive income elasticities and decline for those with negative income elasticities. Of course, the growth will be less pronounced than that for cars. In addition, food products with positive income elasticities at low incomes may become negative at higher incomes. Examples are supermarket label products and one of my favorite products when I was a graduate student: bulk oatmeal!

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TABLE 1. INCOME ELASTICITIES OF DEMAND FOR 27 FOOD PRODUCTS

SIC	Industry	Industry Elasticity
2011	Meat Packing	0.030
2013	Sausages & Prepared Meats	0.635
2015	Poultry Slaughter and Processing	0.533
2021	Creamery Butter	-0.939
2022	Cheese	-0.509
2023	Condensed & Evaporated Milk	-0.823
2024	Ice Cream	0.803
2026	Fluid Milk	0.154
2032	Canned Specialties	0.777
2034	Dried Fruits & Vegetables	-0.416
2035	Pickles , Sauces	-2.232
2038	Frozen Specialties	0.913
2043	Cereal Breakfast	0.599
2052	Cookies & Crackers	0.012
2061	Cane Sugar	-0.412
2062	Cane Sugar Refined	-0.461
2063	Beet Sugar	-0.412
2064	Candy	0.401
2066	Chocolate	0.255
2075	Soybean Oil	-0.186
2076	Vegetable Oil	-2.199
2082	Malt Beverages	-0.491
2085	Distilled Liquor	0.820
2095	Roasted Coffee	-0.397
2097	Manufactured Ice	0.867
2098	Macaroni & Spaghetti	-0.405
2099	Food Preparations	-0.491