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Household Demand Analysis of 100% Grass-fed Milk

Juwon Jang

Ph.D.

Department of Agricultural Economics

Texas A&M University

junyoung73@tamu.edu

Ariun Ishdorj

Associate professor

Department of Agricultural Economics

Texas A&M University

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Household Demand Analysis of 100% Grass-fed Milk

Juwon Jang¹, and Ariun Ishdorj¹

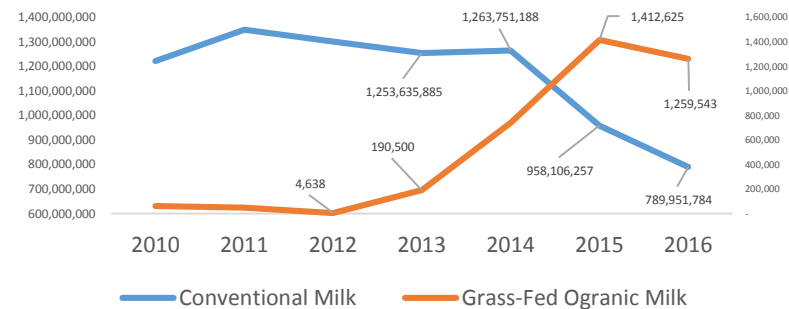
¹Department of Agricultural Economics, Texas A&M University



Background

- A shift in consumer preferences to naturally produced agricultural products has led to changes in the industry.
- The trend appeared in the milk industry. Milk producers began to launch 100% grass-fed milk products to meet the needs of consumers who are seeking milk produced from naturally raised cows.
- According to the Nielsen retail scanner data, the sales of 100% grass-fed milk have surged by 516.2% between 2013 (\$0.2 million) and 2016 (\$1.3 million), while traditional milk sales have declined.

Total Dollar Sales of Conventional and 100% Grass-fed Milk
(Source: Nielsen Retail Scanner Data / Unit: Dollars)



Data and Model

- Households' quarterly fluid milk purchase and price data from 2013 to 2015 were obtained from the Nielsen consumer panel and retail scanner data.
- The Exact Affine Stone Index (EASI) demand system (Lewbel and Pendakur, 2009) was employed to estimate the elasticities of the subcategorized milk products.

Table 1. Estimates of the EASI demand system

Variable	Conventional Milk	Organic Milk	Grass-fed Milk	Flavored Milk
Price of Conventional Milk	-0.231*** (0.000)	0.124*** (0.000)	0.004*** (0.062)	-0.028*** (0.000)
Price of Organic Milk	0.124*** (0.000)	-0.088*** (0.000)	0.001*** (0.628)	0.052*** (0.000)
Price of Grass-fed Milk	0.004*** (0.062)	0.001*** (0.628)	-0.003*** (0.025)	-0.008*** (0.000)
Price of Flavored Milk	-0.028*** (0.000)	0.052*** (0.000)	-0.008*** (0.000)	-0.063*** (0.000)
Household with Children under 18	-0.108*** (0.000)	0.030*** (0.000)	0.001*** (0.012)	0.028*** (0.000)
Highest degree in HH is High School	0.089*** (0.000)	-0.033*** (0.000)	-0.002*** (0.001)	0.013*** (0.000)
Highest degree of HH is College	0.029*** (0.000)	-0.014*** (0.000)	-0.001*** (0.009)	0.007*** (0.000)
White	0.057*** (0.000)	-0.017*** (0.000)	-0.002*** (0.003)	0.004*** (0.068)
Black	0.006*** (0.501)	-0.029*** (0.000)	-0.004*** (0.000)	-0.016*** (0.000)
Asian	-0.069*** (0.000)	0.040*** (0.000)	-0.003*** (0.003)	-0.011*** (0.000)
Hispanic	-0.059*** (0.000)	0.011*** (0.003)	-0.002*** (0.012)	-0.007*** (0.000)
Household Income	0.000*** (0.000)	0.001*** (0.000)	0.000*** (0.367)	0.000*** (0.016)
Constant	0.570*** (0.000)	0.056*** (0.000)	0.007*** (0.000)	0.009*** (0.001)

Note: P values in parentheses; '***', '**', and '*' represent significance at 0.01, 0.05, and 0.1 levels, respectively.

Results

- The results show that households' expenditure shares of 100% grass-fed milk went up as the price of conventional milk decreased, and vice versa.
- Meanwhile, price changes in organic milk did not influence their budget shares of 100% grass-fed milk.
- The results also indicate that households that had children and were headed by the highly educated had a tendency to purchase more 100% grass-fed milk.
- The simulation analysis shows that the expenditure share of 100% grass-fed milk increase by approximately 8.4% from June 2018 to December 2019, as the all-milk price increases by 8.7% during the period.

Discussions

- The recent surge in consumption for 100% grass-fed milk could be attributed to consumers' concerns about feeding grains to cows.
- The surge of 100% grass-fed milk consumption would also initiate issues of standardization and labeling related to grass-fed dairy products.
- Due to the rapid growth in 100% grass-fed milk consumption, milk producers had an opportunity to raise their incomes by transforming their production method into feeding pasture instead of grains.

Reference

Lewbel, A., and K. Pendakur. 2009. "Tricks with Hicks: The EASI Demand System." American Economic Review 99(3):827-63.

Objective

- First, we analyze the demand of 100% grass-fed milk.
- Second, we simulate the change of 100% grass-fed milk consumption based on USDA 2019 milk price forecasts and estimated price elasticities in this study.