Urban-Rural Differences in Consumer Demand for Local and Organic Food

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Selected Poster prepared for presentation at the 2022 Agricultural & Applied Economics Association Annual Meeting, Anaheim, CA; July 31-August 2

Urban-Rural Differences in Consumer Demand for Local and Organic Milk in Pennsylvania

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Introduction

- Rural area participants in the organic and local food systems in significantly different ways from their urban counterparts (Low et al., 2015).
- This study focuses on Pennsylvania state, which includes metropolitan counties, nonmetropolitan counties and rural counties.
- Unlike organic food, the definition for local food is often vague.
- In general, geographical proximity to production constitutes the basis for defining local food (Enthoven et al., 2021; Hill, 2008; Curtis, 2004).

Objectives

- Assesses the demand for local and organic milk and the urban-rural difference in consumers' willingness to pay.

Supply and Demand Sides

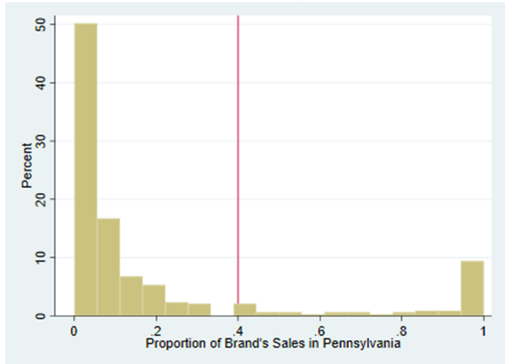
- From the supply Side, dairy is a huge industry in PA contributing 3.8% directly and indirectly to the state's total GDP.
- From the demand Side, willingness to pay for local and organic products is a popular topic.
- Organic milk commands a price premium but requires significant capital investment.
- Selling "local" milk might require only a change in labelling/packaging. However, the ability to command a premium is geographically limited.

Data

- We use IRI Consumer Panel Data, which includes detailed purchase information and many other potentially relevant product and household characteristics.
- We focus on the data of unflavored dairy milk in 2018.
- We also use Rural and Urban Code (RUCA) from USDA to interact the local and organic milk on rurality.

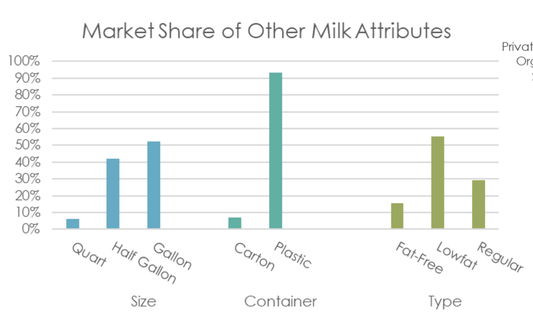
A Novel Definition of Local Foods

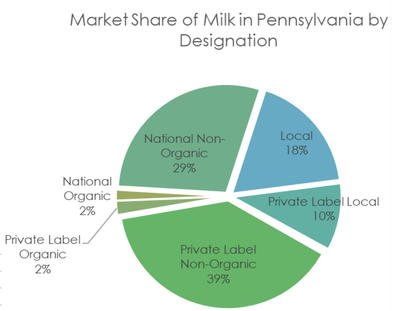
- An online search of brands for references of "local" on brands' websites could help identify local food, but it is time-consuming and subjective.
- Previous studies indicate that the "locality" Americans identify most strongly with is their state. We thus define local products at the state-brand level.
- For each brand in the data, we observe sales by store. Aggregating those sales up to the state level, we identify the proportion of brand sales in each state.
- **If more than a certain percentage of the brands' sales are contained to a given state (i.e. 40%), we then define that brand as local to that state.**
- By crossing referenced results with our web-based, subjective product identification approach, it shows this algorithm results are robustness.
- Strategy effectively identifies important local brands regardless of specific cutoff.



Method— Discrete Choices Analysis

- Constructing a limited choice set: from around 10,000 to 80 unique combinations of attributes we care about.





- Dimensions of choice: local, organic, private label, size (gallon, half gallon, quart), container (carton or plastic), type (regular, low-fat, fat-Free).

Discrete Choice Demand Estimation

- Treat each individual milk purchase as a separate purchase event where consumer chooses one product from the choice set.
- Big assumption: purchase events are independent.
- Nonlinear model: use control function to implement instrumental variable strategy following Petrin and Train (2010).

Conditional Logit Demand Estimation Pennsylvania Milk 2018		
Local	-0.785***	-0.641***
	(0.0493)	(0.0520)
Organic	-0.345***	1.416***
	(0.167)	(0.289)
Private Label	-0.199***	-0.400***
	(0.0456)	(0.0480)
Price	-1.003***	-1.754***
	(0.0602)	(0.108)
Alternative Specific Controls	Yes	Yes
Control Function	No	Yes
Willingness to Pay		
Local	-$0.78	-$0.37
Organic	-$0.34	$0.81
Private Label	-$0.20	-$0.23

Suburban Households Willing to Pay for Local Milk

- Using RUCA codes at the zip code level.
- Positive willingness to pay for local milk in areas we could describe as **suburban**.
- Pennsylvania milk producers could market their products under local brands in these areas.

Willingness to Pay for Local Milk by RUCA code	
Metropolitan Area Core	-$0.29
Metropolitan area high commuting	-$0.21
Metropolitan area low commuting	-$0.02
Micropolitan area core	$0.00
Micropolitan high commuting	$0.36
Micropolitan low commuting	$0.49
Small town core	$0.24
Small town high commuting	$0.46
Small town low commuting	-$1.01
Rural areas	$0.02

Next Steps

- Apply this model on different products and different states.
- Using different rurality definitions, such as population density, percentage of the agricultural land, etc..
- Policy suggestions.

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This work is supported by USDA's National Institute of Food and Agriculture (NIFA). The findings and conclusions in this publication are those of the authors. The analysis, findings, and conclusions expressed in this report should not be attributed to IRI. The findings and conclusions in this publication are those of the authors and should not be construed to represent any official USDA or U.S. Government determination or policy.