Spatial Variations in the Food Environment of Manhattan, NY
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Abstract
Organic food availability in stores presumably has expanded since the implementation of the USDA National Organic Standard in 2002. Research suggests that the likelihood of purchasing organic food depends on consumer characteristics, such as income, education, and ethnicity. However, few studies consider the impact of the availability of organic food when analyzing consumer demand. A recent paper exploring organic consumers incorporates a crude measure of access to organic food, which shows some promise at closing this research gap. This paper extends this research by making use of a unique in-store dataset of organic food availability, and presents (1) initial findings on spatial availability of organic food in Manhattan NY, and (2) preliminary efforts towards an econometric analysis explaining the patterns of availability based on socioeconomic and spatial characteristics. The methods under development here can be readily extended to the healthy food access literature, by proposing a methodology which links actual food availability (rather than implicit food availability associated with store location) to socioeconomic characteristics. Thus future extensions of this research will have direct implications for diet-related public health issues, and can potentially add to the body of literature that informs local and federal policy decisions regarding food access.

Introduction
To incorporate the availability of organic food, survey instrument developed and used in Manhattan, New York:
- 23 square miles
- About 70K residents per square mile
- Median HH income: $59K, mean $98K
- 36% of HH income < $35K
- 61% of children free lunch eligible

Methods: Survey Instrument
Phase I: Food Systems I class – Fall 2010
Phase II: Hired team – January 2011
1260 Food Stores

Methods: Survey Instrument

Results I: Econometrics

<table>
<thead>
<tr>
<th>Product</th>
<th>Discrete availability index</th>
<th>Depth of availability index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy</td>
<td>26 (38)</td>
<td>11 (18)</td>
</tr>
<tr>
<td>Produce</td>
<td>6 (17)</td>
<td>7 (14)</td>
</tr>
<tr>
<td>Frozen produce</td>
<td>7 (22)</td>
<td>0 (1)</td>
</tr>
<tr>
<td>Meat</td>
<td>4 (17)</td>
<td>3 (12)</td>
</tr>
<tr>
<td>All products</td>
<td>9 (18)</td>
<td>7 (13)</td>
</tr>
</tbody>
</table>

Table 2: Indices of organic food availability: Manhattan, NY January 2011

Spatial Location of Organic Food Availability

Household Income: Highest median income below the northern most edge of Central Park. The stores with the greatest number of organic food items, with the exception of a few store locations, are located in the census tracts with the highest median income.

Spatial Availability of Each Product Line, (Organic and Conventional)

The availability of all healthy foods show a similar spatial distribution to the individual agents' income level, with organic foods being limited to the highest income tracts.

As the regression results suggest, healthy food availability is likely to be highly endogenous to organic food availability, and that offering organic foods are likely to offer conventional versions of similar foods. This potential cross-elasticity will be investigated in future research.

Conclusions and Future Research
This paper draft presents research currently in development; the initial phase of this research examines the availability of organic food in retail stores in Manhattan NY. To do so, the research makes use of a new, unique dataset collected by the author. While numerous technical difficulties are still present, the preliminary results are promising. The inclusion of availability of organic food logically strengthens the current body of literature that examines organic consumers and the relation of organic products. One important finding is that organic food is available throughout Manhattan, although few stores carry a wide range of organic food. The most significant finding is that organic food is less available in census tracts with a high percent of black households in residence, which suggests that earlier findings of black households being less likely to buy organic food may be the result of availability and not preferences. Future work will ask the following questions: what are the spatial patterns of healthy food access? How, and to what degree, does the availability of healthy food depend on demographic variables? To what extent do restaurants crowd out healthy food availability in Manhattan? How does availability vary around Manhattan in stores accept federal nutrition benefits? Finally, are there policy instruments that can be adopted to increase the availability of healthy foods?