U.S. Consumer Demand for Differentiated Eggs

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The U.S. egg market is also differentiated by brands. The Prevention of Farm Animal Cruelty Act, which bans eggs from the battery cage system, was passed in California in 2008 and will be effective in January 2015. Similar regulations were passed in Michigan in 2009 and are under discussion in several other states. Even a federal law to improve the lives of egg-laying hens has been proposed. The regulations may cause a shift in egg demand towards certain kinds of eggs.

The economic consequences of the regulations is determined by their effects on both supply and demand for eggs. A few studies used stated preference methods, including surveys and experiments, and found consumer preferences towards animal welfare-related characteristics. Studies using revealed preferences data obtained inelastic results. A low willingness to pay for organic eggs was found among most U.S. shoppers from a hedonic analysis (Chang, Lusk, and Norwood 2010), while U.S. consumers in five east coast cities were found to be willing to pay significant premiums for organic eggs (Satimanon and Weatherspoon 2010).

The U.S. egg market is also differentiated by brands. The conventional egg market is characterized by the domination of private labels over national brands, and eggs are the second biggest private label item in the supermarket (Oberholtzer, Green, and Loper 2006). Private labeling of organic eggs is also growing.

The economic consequences of the regulations is determined by the domination of private labels over national brands, and eggs are the second biggest private label item in the supermarket (Oberholtzer, Green, and Loper 2006). Private labeling of organic eggs is also growing.

Table 1. Average Market Share and Market Price by Production Practice and Brand

<table>
<thead>
<tr>
<th>Brand Type</th>
<th>Market Share</th>
<th>Market Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>NB Organic (NB OG)</td>
<td>3.35%</td>
<td>$0.02</td>
</tr>
<tr>
<td>PL Organic (PL OG)</td>
<td>2.95%</td>
<td>$0.35</td>
</tr>
<tr>
<td>NB Non-Organic (NB NOG)</td>
<td>62.91%</td>
<td>$0.13</td>
</tr>
<tr>
<td>PL Non-Organic (PL NOG)</td>
<td>30.75%</td>
<td>$0.18</td>
</tr>
</tbody>
</table>

Method

A first-difference Almost Ideal Demand System for egg products differentiated by production methods and brand type was specified:

\[ W_i = a_i + \sum_{j=1}^{n} \alpha_j \log p_{ij} + \beta_i \log x_i + \delta_i \log r_i + \epsilon_i \]

Weak separability between products by production practices and brands were tested using an adjusted Wald test.

Hypothesis 1: Consumers first choose eggs by the production practices and then by the brand types.

Hypothesis 2: Consumers first choose eggs by the brand types and then by the production practices.

Results

Organic eggs were no longer a luxury item but a necessity for an average consumer during the sample period.

Demand for all egg products was own-price elastic except for private-labeled conventional eggs. The quantity demanded for national-branded eggs was more responsive to price changes than private-labeled eggs. Income played a relatively more important role in the demand for non-organic private-labeled eggs.

Table 2. Estimated Expenditure and Own-Price Elasticities

<table>
<thead>
<tr>
<th>Brand Type</th>
<th>Expenditure</th>
<th>PL OG</th>
<th>NB OG</th>
<th>PL NOB</th>
<th>NB NOB</th>
</tr>
</thead>
<tbody>
<tr>
<td>NB Organic</td>
<td>0.82</td>
<td>0.71</td>
<td>1.10</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td>PL Organic</td>
<td>-1.25</td>
<td>-1.54</td>
<td>-0.68</td>
<td>-1.31</td>
<td></td>
</tr>
<tr>
<td>NB Non-Organic</td>
<td>-1.42</td>
<td>1.17</td>
<td>0.84</td>
<td>-1.58</td>
<td></td>
</tr>
<tr>
<td>PL Non-Organic</td>
<td>-1.25</td>
<td>-1.54</td>
<td>-0.68</td>
<td>-1.31</td>
<td></td>
</tr>
</tbody>
</table>

For both organic and non-organic egg products, NB and PL eggs were shown to be substitutes for each other.

The demand for non-organic eggs was not responsive to the changes in price of organic eggs.

An increase in the price of non-organic eggs would result in a rise in the demand for organic eggs.

Table 3. Uncompensated Cross-price Elasticities

<table>
<thead>
<tr>
<th>Brand Type</th>
<th>PL OG</th>
<th>NB OG</th>
<th>PL NOB</th>
<th>NB NOB</th>
</tr>
</thead>
<tbody>
<tr>
<td>NB Organic</td>
<td>-0.68</td>
<td>0.62</td>
<td>0.87</td>
<td>-1.57</td>
</tr>
<tr>
<td>PL Organic</td>
<td>0.87</td>
<td>-0.68</td>
<td>-1.57</td>
<td>0.87</td>
</tr>
<tr>
<td>NB Non-Organic</td>
<td>-0.24</td>
<td>0.88</td>
<td>-0.24</td>
<td>0.88</td>
</tr>
<tr>
<td>PL Non-Organic</td>
<td>0.001</td>
<td>0.004</td>
<td>0.283</td>
<td>0.005</td>
</tr>
</tbody>
</table>

The weak separability hypotheses were rejected, indicating consumers simultaneously chose eggs using both attributes: production practices and brand types.

References:


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