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# **ORGANIC FOOD AND AGRICULTURE**

**NEW TRENDS AND DEVELOPMENTS  
IN THE SOCIAL SCIENCES**

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Edited by **Matthew Reed**

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# ORGANIC FOOD AND AGRICULTURE – NEW TRENDS AND DEVELOPMENTS IN THE SOCIAL SCIENCES

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**Organic Food and Agriculture –  
New Trends and Developments in the Social Sciences**

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## Preface

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The trajectory of organic food is never easy to predict, which makes it such a fascinating subject to study. It brings together controversies about science, society and nature onto the dinner plate, stressing out questions of global importance, such as 'what should I purchase and eat today?'. At present, the sales of organic food are going through a trough and the organic industry is consolidating as it learns how to operate in a new environment. The long boom in the key markets for organic products; North America, the European Union and Japan, is faltering and the domestic purchasing power of many people is increasingly constrained. Simultaneously organic agriculture, under the name of agro-ecology, is increasingly being presented as an answer to producing food sustainably, and improving the livelihoods of farmers in the global south. The recent report of the United Nations Special Rapporteur on the Right to Food, Olivier De Schutter, which recommends the global adoption of agro-ecology, is built on the sustained effort of academic researchers to demonstrate, through high quality research, the potential of organic agriculture (De Schutter 2011).

In the regions of the world where organic food is sold through markets, by which we mean the increasing chains of supermarkets or multiple-retailers, but also the farmers' markets, box schemes and subscriptions schemes, the concerns are different. Rather than those of technical execution or appropriateness for climatic conditions, they are more about how and why people chose to purchase certified organic products within a complex brandscape of competing claims on their attention and ultimately their purses. As many have argued, this focus on promoting organic food through the market place is not an accident but a deliberate strategy by the wider social movement surrounding organic food and farming. In a liberalized and globalized market for food, organic food has taken the challenge of the dominant model when it comes to consumers and the increasing amount of choices they have. Many other social movements have chosen to promote their cause through confrontation, lobbying or dramatic public protests, while the organic movement has opted to follow the route of radical consumerism.

This is a route that is not without controversy, as it attracts the carpetbaggers who are looking for a quick profit without sharing the ethics of the movement, and it also puts the movement's critique of how food is distributed into an ambivalent position. For some commentators it is not possible to contest the commodification of food whilst it

is being stacked on the shelves of Wal Mart, Carrefour or Tesco. Yet, in the past two decades the entry of organic foods onto the shelves, frequented by the most powerful collective of consumers on the planet, has caused many changes. It has led to questioning of how food is produced, the risks taken by novel technologies in the food chain and ethics of agriculture, as well as the way in which the food market works in a globalised society.

The chapters and sections in this book reflect those discussions and how they have been developed within the social sciences. As one can imagine there is an emphasis on the way in which organic food is sold, the type of the stores, the operation of the market place, and how the decision making process is structured in the minds of consumers. There are also discussions on the food system and how it relates to the spatial practices of farm businesses, and the role of policy. We are fortunate to have authors from across the planet, in this book, who are attempting to understand how this global phenomenon has localised in their society. There are also lessons that can be learned, not only from places where organic food and farming is well established such as the US, Germany or the UK, but from where it is emerging and, as such, adapting to the aspirations of different societies. Until recently the literature about organic food and farming was limited because the dialogue has been a global one, and as the body of research has grown it is important that it remains so.

This book makes use of the recent appearance of the open access publishing. In contrast to the pattern of publications that dominate in academic community, where authors contribute their work for free and readers pay, in this book all the authors have paid to ensure that their work is freely available to readers. Whilst many academic discussions are available through books, frequently their limited publication runs mean that these works are rarely available as a paperback and are costly as hardbacks. Open access offers authors the opportunity to address a wider readership and perhaps to engage in a deeper dialogue than the more established routes of publishing. The fact that the authors have paid to cover the costs of making their work freely available does not mean that the thresholds of quality have been lowered; all the authors in this book are experienced in academic publishing and all of the papers have gone through a careful editorial process. The result is the book you are holding in your hands, or more likely, reading on the screen of your computer or e-reader. It represents a window into the scholarly discussion of organic food and agriculture. I would encourage you to take the opportunity to not only read the chapters but also engage with the authors and to foster a dialogue about the future of our food.

The organic movement started in the early twentieth century in response to the environmental threats that farmers, scientists, doctors and concerned citizens saw threatening global agriculture. At that time, they were worried about the decrease in the quality of food, the fact that planet Earth was turning more and more into a desert and it was getting harder to feed people. These are questions that are reoccurring in people's minds, and they remain relevant in today's society. (Reed 2010). As recent discussions of agricultural productivity have reminded us, since 1985 more than half

of all the synthetic nitrogen fertiliser ever applied has been used; there are increasing concerns about the availability of phosphorous and the limits of an agriculture based on the use of fossil fuels (Cordell *et al.* 2009, Horlings & Marsden 2011). There is an increasing clamour for an intensification of agriculture that threatens to increase the technocratic control of agriculture, just as many social scientists are calling for a deepening of the democratic control of agriculture, and social movements are attempting to wrest sovereignty over their food, back from the global governance of the corporations and the world trade organisation. It is unlikely that there will be any lessening in the relevance of the arguments around organic food and farming, so the importance of rigorous enquiry by social scientists will remain of interest to, and in the interests of, a wide audience. This will require that social scientists are both open with their findings and methods but also open to the challenges that these times bring to their methods of social enquiry.

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# **Part 1**

## **Consumers and Markets**



# The Consumption Choice of Organics: Store Formats, Prices, and Quality Perception – A Case of Dairy Products in the United States

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## 1. Introduction

Consumers choose to purchase organic foods for a variety of reasons. Some of the commonly cited perceptions among consumers are that a) organic foods are grown without pesticides or other toxic chemicals and so they are healthier for them and their families, b) organic farming relies on more sustainable natural biological systems, which are better for the environment, c) practices and standards have evolved in the U.S. to improve the treatment of organically raised livestock. However, cropping and livestock systems used in organic farming tend to have higher costs per unit of output than in conventional farming. When these costs are successfully passed downstream, it ultimately means higher retail prices for those products that use the organic label. The price of organic food is typically 30-40%, and sometimes over 100%, more than conventional (non-organic) alternatives. The hefty price premium of organic food has been one of the major reasons for consumers to choose conventional over organic foods (Kavilanz, 2008). Wal-Mart in 2006 launched an aggressive "going green and organic" campaign that would greatly increase the number of organic products they offered with a price target of only 10% above the price for conventional counterparts. This market expansion and low pricing strategy has not only enhanced competition among food retailers in the United States but also encouraged consumers to rethink whether and where to buy organic foods: i.e. the choice of product type, organic or conventional, and the format of store in which the products were purchased.

Much research focuses on the rationales of how consumers make their store format choice (Bell et al., 1998; Bell & Lattin, 1998; Bhatnagar & Ratchford, 2004; Briesch et al., 2010; Ho et al., 1998; Hsieh, 2009; Hsieh & Stiegert, 2012; Messinger & Narasimhan, 1997; Tang et al., 2001). The studies show that the consumption in some product categories has stronger impacts on certain store format than the others when they are searching where to buy. In this research, we center our analysis on the other side of the question, that is, whether and how households patronizing different store formats would have different price sensitivities in making decision between organic and conventional alternatives for two dairy-case products. In particular, we examine the role of store format choice in households' consumption choice between organic and conventional alternatives for milk and eggs, two products that are purchased frequently by a large share of households and regarded as gateway goods for grocery retailers to attract consumers into stores.

Three major store formats are considered: A) value-oriented retailers (e.g. supercenters and price clubs) representing a super-cheap nontraditional shopping format characterized by low-pricing, broad assortment overall and especially in nonfood categories and low service; B) a format represented by traditional supermarkets and grocery stores, generally featuring promotional (HiLo) pricing, broad assortment in food categories and some service; C) high-end specialty stores (e.g. natural food supermarket chains) providing consumers with high-priced upscale product offerings and a higher level of service. To address the choices over all formats of retail outlets, we use a unique dataset collected by A.C. Nielsen, which covers the household purchases at any retail outlets including the retailers, such as Wal-Mart Inc. and Whole Foods Market Inc., that do not provide data to scanner data service firms. Our study is for a single large metropolitan area in a non-coastal U.S. city for a pair of two-year weekly samples, 2005-06 and 2007-08.

The remainder of the chapter is organized as follows. The next section contains an overview of the market background and trends, including the data, the consumer and retailer profiles and the consumption patterns of dairy products. Section 3 presents the model setup, estimation procedure and regression results for the consumption choice of organics. The last section contains a summary of our findings and their implications for marketing and farming decisions.

## **2. The market: Background and trends**

### **2.1 The U.S. organic food market**

Organic market has been one of the fastest growing markets in recent years. Aggregate organic food sales in the U.S. have maintained a 15-20% annual growth rate over the past decade. The report by (Organic Trade Association, 2009) indicates that the US sales of organic foods totaled nearly \$23 billion in 2008, which marks a 15.8% increase compared to sales in 2007 and is over 6 times of the sales in 1997. The organic penetration rates, defined as organic food as a percent of total U.S. food sales, have increased from 0.97% in 1997 to 3.59% in 2009 (see figure 1). According to (The Hartman Group, 2008), over two-third of U.S. consumers buy organic products at least occasionally and about 28 percent of these organic consumers are weekly organic users.

Figure 1 also shows that the traditional supermarkets and value-oriented retailers have become more important outlets where consumers shop for organic food as their market shares combined have increased from 30% to 46% over the past decade. On the contrary, sales of organic foods through natural food chains, such as Whole Foods Market and Wild Oats, and other independent natural food stores peaked at 68% of total organic sales in 1995. By 2005, the market share of natural food channels had however dropped to 47% of sales.

### **2.2 The data**

We use a multi-outlet panel dataset (Homescan by A.C. Nielsen) for a non-coastal U.S. city that covers a 208-week period between December 26, 2004 (hereafter January, 2005) and December 27, 2008. The dataset contains detailed purchase information for 6 food product departments (dry goods, frozen, dairy, deli, meat, and fresh produce) and over 600 product categories of food and non-food items sold in grocery stores or other retail outlets. The households report their purchases weekly by scanning either the Uniform Product Code (UPC) or a designated code for random weight products of all their purchases from grocery

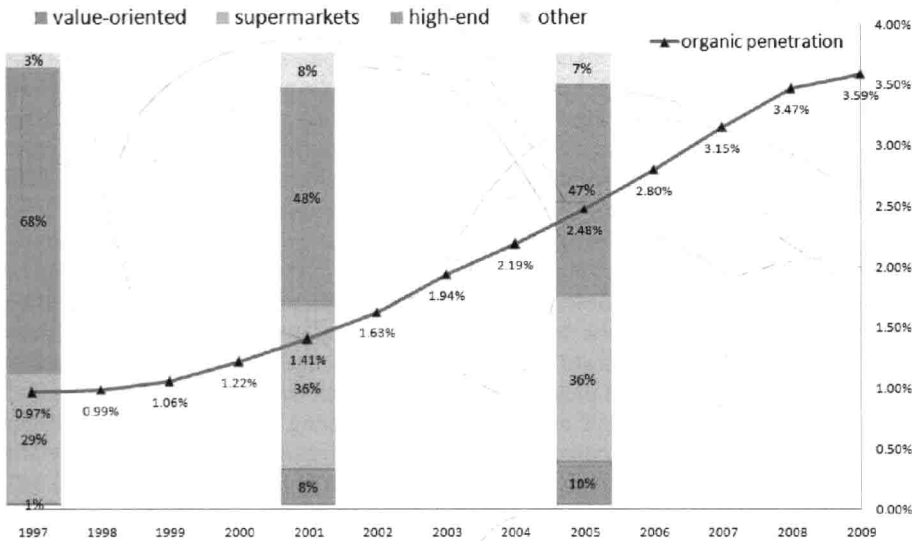


Fig. 1. The U.S. Organic Food Market, 1997-2009 (Organic Trade Association, 2007, 2009)

stores or other retail outlets. These purchase data include price, quantity, promotional information, and product characteristics. One of the product characteristics contained in the data is the identifier for organic products. For UPC-coded products, organic products can be identified by the presence of the USDA organic seal or with organic-claim codes created by A.C. Nielsen. For random-weight purchases, we use product descriptions to identify organic products.

|                                      | 2005-06 |        | 2007-08 |        |
|--------------------------------------|---------|--------|---------|--------|
|                                      | Mean    | St Dev | Mean    | St Dev |
| Number of households                 | 710     |        | 942     |        |
| Number of shopping trips             | 161.34  | 101.80 | 137.83  | 86.75  |
| Average spending per trip            | 23.06   | 24.67  | 18.40   | 20.44  |
| Organic penetration rate (frequency) | 1.20%   | 0.07   | 1.84%   | 0.10   |
| Organic penetration rate (spending)  | 1.24%   | 0.08   | 1.93%   | 0.10   |
| Household size                       | 2.36    | 1.26   | 2.40    | 1.36   |
| Income (\$0000s)                     | 6.33    | 3.64   | 6.86    | 4.12   |
| Some college educated                | 87.9%   | 0.326  | 88.1%   | 0.324  |
| Married                              | 57.9%   | 0.494  | 58.0%   | 0.494  |
| Preschool children (age <6)          | 5.8%    | 0.233  | 9.8%    | 0.297  |
| School-age children (age 6-18)       | 21.2%   | 0.409  | 21.8%   | 0.413  |
| Elderly (age >65)                    | 22.5%   | 0.417  | 22.3%   | 0.417  |

Table 1. The Consumer Profile, 2005-2008

Due to the inconsistency on the coverage of random weight items over the analyzed period, we separate the four-year period into two, i.e. 2005-2006 and 2007-2008. The shopping-duration criterion was applied to ensure that each panelist was faithful in recording purchases and remained in the panel for the entire period. The resulting dataset had 710 households with a total of 45,877 shopping trips in 2005-06 sample and 942 households with 48,469 trips in 2007-08 sample. The selected retail chains for our analysis include 2 value-oriented retail chains consisting of 29 (37) stores, 4 traditional supermarket chains featuring 172 (147) stores, and 1 high-end specialty supermarket chain with 6 (7) stores in our 2005-06 (2007-08) sample.

### 2.3 The consumer profile

Descriptive statistics of the consumer profile are provided in table 1. The statistics show that there were significant reductions in shopping frequency and basket size over the two sample periods, which may indicate a greater reliance on food away from home during the latter period. Our data may also pick up some impact from the economic downturn for the U.S., particularly in the latter half of 2008 when the housing related credit crisis began to pick up steam. In this trend of consumption reduction, organic food is however relatively less affected as its share to total food consumption has increased from 1.20%/1.24% to 1.84%/1.93% in terms of frequency/spending (dollar amount). We observe no significant changes in household demographics, with an exception that the percentage of household with pre-school children (age<6) had increased from 5.8% (2005-06) to 9.8% (2007-08) on average.

### 2.4 The retailer profile

Table 2 depicts the characteristic differences among the retailers of three store formats. Location or network wise, high-end specialty stores are much less accessible compared to the other two formats as shown in number of stores, share of trips, share of spending, as

|   | 2005-06        |               |          | 2007-08        |               |          |
|---|----------------|---------------|----------|----------------|---------------|----------|
|   | value-oriented | super-markets | high-end | value-oriented | super-markets | high-end |
| Number of stores                          | 29             | 172           | 6        | 37             | 147           | 7        |
| Ave. travel distance (miles)              | 9.02           | 8.87          | 16.96    | 8.74           | 9.54          | 14.45    |
| Share of trips                            | 19.32%         | 79.46%        | 1.21%    | 21.47%         | 78.11%        | 0.43%    |
| Organic% in total trips                   | 0.27%          | 0.78%         | 25.07%   | 0.80%          | 1.38%         | 35.07%   |
| Share of spending                         | 18.49%         | 79.69%        | 1.81%    | 21.34%         | 78.01%        | 0.64%    |
| Organic% in total spending                | 0.32%          | 0.96%         | 21.91%   | 1.02%          | 1.66%         | 29.99%   |
| <b>Pricing &amp; Discount</b>             |                |               |          |                |               |          |
| Price index (selected basket)             | 0.968          | 1             | 1.505    | 0.919          | 0.929         | 1.373    |
| Organic PI (selected basket)              | 0.977          | 1             | 1.357    | 1.046          | 1.039         | 1.449    |
| % discount (overall)                      | 12.81%         | 40.12%        | 11.69%   | 10.25%         | 35.99%        | 9.51%    |
| % discount (organics)                     | 0.05%          | 0.29%         | 4.06%    | 0.08%          | 0.43%         | 3.42%    |
| <b>Breadth &amp; Depth of Assortments</b> |                |               |          |                |               |          |
| Ave. breadth (# UPCs) per store           | 2038           | 1505          | 659      | 1557           | 1517          | 201      |
| Organic% in total breadth                 | 0.79%          | 2.28%         | 25.84%   | 1.35%          | 3.62%         | 31.84%   |
| Ave. variety per category                 | 33.98          | 63.72         | 9.07     | 32.86          | 57.78         | 4.68     |
| Organic% in variety                       | 7.47%          | 8.35%         | 49.54%   | 8.91%          | 10.52%        | 61.03%   |

Table 2. The Retailer Profile, 2005-2008

well as by the average travel distance from consumer’s home to the store. However, it is documented that these high-end specialty stores are the major outlets for organic food, as their organic shopping rates are by far higher than those of the other two formats. In our selected sample market, traditional supermarkets remain the most important outlets among the three formats, although increasing market shares of value-oriented stores are observed in the data.

Regarding to pricing factors, we observe no significant price difference between value-oriented retailers and supermarket chains, but much higher prices at high-end specialty stores in both organic and non-organic alternatives. The data of discount use rates suggest that unlike the other two, traditional supermarkets promote promotional pricing. However, interestingly, we observed a much higher discount use rate applied to organic purchases at high-end stores than elsewhere. As to the coverage of product assortments, value-oriented retailers have broadest coverage but supermarket chains offer more varieties per category on average. The high-end specialty stores carried a much higher percentage of organic products in terms of both broadness and variety, but with a much small scale of assortments in general.

**2.5 The consumption of dairy-case products**

We select two staple dairy-case products, milk and eggs, as the center of our study. In our analyzed sample, milk was the most frequently purchased item in grocery shopping trips in both organic and conventional categories with shares of purchase frequency being about 20% and 3% respectively, while eggs ranked 9th (organic) and 10th (conventional) among all categories. In terms of dollar amount, the data (table 3) show that the expense shares were 5.5%~9.5% for milk and 1%~2.3% for eggs. As shown in table 3, we observe an increasing trend of organic penetration on both products – the share of organic food to total food expense increased from 6.0% to 10.3% for milk and from 0.6% to 1.3% for eggs. In addition, we observe significant drops in price premium of organic between the two periods of sample, which are likely to be associated with the market transitions that may have occurred due to Wal-Mart’s market expansion in 2006.

**3. The analysis: Consumption choice of organics**

**3.1 Data overview of consumption choice**

Figure 2 depicts the consumption choice for milk and eggs based on actual purchase data recorded in our analyzed market during the period of 2005-2008. The data show a fast-growing consumption pattern of organics in the case of milk and eggs. 7.68% of milk

|  | milk    |         | Eggs    |         |
|--|---------|---------|---------|---------|
|  | 2005-06 | 2007-08 | 2005-06 | 2007-08 |
| Ave. share in total expense per trip               | 5.5%    | 9.5%    | 1.0%    | 2.3%    |
| Ave. product expense per trip                      | 0.93    | 1.24    | 0.18    | 0.30    |
| Ave. % organic in total product expense            | 6.0%    | 10.3%   | 0.6%    | 1.3%    |
| Ave. price premium (milk \$/gallon, eggs \$/dozen) | 2.76    | 2.26    | 1.69    | 1.33    |
| Ave. % discount used for purchase                  | 22.8%   | 17.9%   | 27.6%   | 13.8%   |

Table 3. The Shopping Patterns of Milk and Eggs, 2005-2008



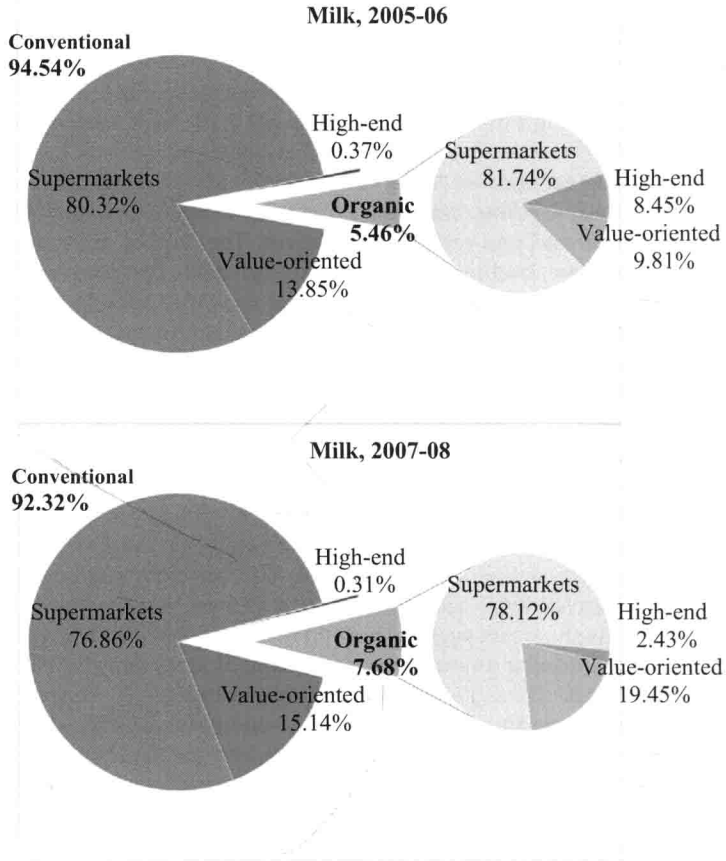


Fig. 2a. Consumption Choice by Store Format and Product Type for Milk, 2005-2008

purchase was organic in 2007-08, while organic milk purchase was only 5.46% out of total in 2005-06. In the case of eggs, organic choice though still accounts for only a small portion of egg purchase, its share has grown from 1.42% to 2.31%, which is over 60% of growth.

In terms of outlet choice, supermarket was the dominant store format of which consumers purchased their milk and eggs, accounting for 59.70% to over 80% of total number of transactions in all categories for both periods. We however observe a trend of market transition, in which consumers are switching their organic purchases from high-end specialty stores to value-oriented stores or supermarkets. In the case of milk, the value oriented retailers' share of organic milk doubled (increased from 9.81% to 19.45%) mainly at the expense of the high-end stores' sales: their share dropped from 8.45% to 2.43% between the two periods. This change reflects the marketing strategy by Wal-Mart and others to expand on organic offerings in 2006. The impacts are even more apparent in the market of organic eggs, as around 30% of consumers switched from high-end's to value-oriented stores and supermarkets for organic eggs purchase.