

# RETAIL PRICE DIFFERENTIAL BETWEEN ORGANIC AND CONVENTIONAL FOODS

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## **ABSTRACT**

*The consumption of organic foods in Canada has been increasing continuously for the last few decades. Although this is apparent that organic foods are sold at higher price, a formal proof of such anecdotal evidences is difficult due to the lack of systematic collection of retail price data on organic foods. The purposes of conducting this study are: (1) to collect retail price data for organic foods along with their conventional counterparts, (2) to find out the actual premium price charged to the consumers for organic foods, and (3) to identify the variability of premium price among different grocery outlets, food groups and different times. Price data of nearly 100 organic food items with their conventional counterparts were collected from three common grocery stores – Sobeys, Save-On Foods and Superstores. For comparability, all price levels were converted to nearly common units of 100 g or 100 ml. Such price data were organized into 13 different categories, and then compared between organic and conventional to obtain the actual premium price charged to the consumers for organic foods. It is observed that the variation in prices from one week to the next is relatively small. But the price premium varies substantially among different food groups. The premium price for food groups was as low as 22 percent to as high as over 100 percent. Although there were differences in price premium charged by different stores, these were not statistically significant.*

## **INTRODUCTION**

Organic foods have become common in most grocery stores, either side-by-side with conventional foods or in separate aisles. This was not the case a few decades ago. Organic foods, at times, were produced in small quantities, mostly in family farms or in specialty organic farms. The products were also sold through small specialty produce stores or cooperatives or sometimes by the farms themselves. Consumers buying organic foods used to be well-integrated and had their own informal (or sometimes even formal) associations as they all had a common idea, a strong preference toward organic foods. The consumer pool was small, and was often considered a small minority. Similarly, the supplier pool was also small and mostly localized. The important notable characteristic was that their preference for organic foods was so strong that they hardly considered conventional foods as substitutes. And as such comparing prices between organic and conventional would have not been appeared as a major factor. In a way, the market for organic foods was completely segregated from the market for conventional food.

Over the past few decades, the situation has changed. The organic industry has been flourishing in all continents at varying intensity. Continuously increased sales volume of organic food is a clear reflection of an increased consumer demand. Consumers' preferences have changed. Rather than a bimodal distribution of consumers' demand between organic and conventional foods, it has become more or less a continuous distribution, which warrants a comparison between prices of organics and their conventional counterparts.

Organic food market has become ingrained into the conventional food market as the consumer behavior has evolved. Large producers of conventional foods traditionally had no interest in producing organic foods as their consumer pool was not interested in. However, increased demand for organic foods result increased price.

Increased price contributes to soaring profits to producers, which makes them to enter into the production of organic foods. This allows producers to capture economies of scale and reduce cost of production, which eventually opens the door for conventional retail grocery stores to have dependable and uninterrupted supply of organic foods. Most conventional food stores now participate in providing organic food items to their customers (Oberholtzer et al., 2005). Some stores have designated sections for organic foods, whereas, others have chosen to shelf side-by-side with conventional foods to offer customers a choice. Regulators have also come forward to contribute their share as large number of producers started claiming their product to be organic. Consumers need a clear guideline to select and purchase actual product they are to buy. The regulatory agency has to ensure and maintain the standard and quality of food. In Canada, the development, maintenance and implementation of food standard are the responsibility of the Canadian Food Inspection Agency (CFIA), a federal organization within the Ministry of Industry.

The widespread distribution and availability of organic foods through conventional grocery stores is an indication of increased activities in both sides of the conventional food market for organic items. From the perspectives of retail grocery stores, it is important to develop complete understanding on the consumer behavior related to organic foods, which was the primary motivation of conducting this study. Why consumers prefer organic food over conventional food and how strong such preference is for what type of food are important questions to be answered for marketing organic foods. The general perceptions vary, and different people may buy organic foods for different reasons. This may also vary by localities or geographical reasons, age, sex or ethnic groups and many others. Research studies are mixed in this. Several studies (Botonaki et al, 2006; Kihlberg and Risvik, 2007; Zhao et al, 2007) found that consumers prefer organic foods because of taste, freshness, quality, safety and health conditions. Others (Thogerson and Olander, 2006; Onyango et al, 2007; Zhao et al, 2007) found that urban, rich and educated people prefer organic foods. Whatever the reason may be, the demand for organic foods definitely increased substantially leading to higher price.

Price premiums for organic foods primarily come from consumers' demand. Over the last decade, higher price for organic foods compared to their conventional counterparts have contributed to the growth of certified organic farmland and the expansion of organic food industry. Part of the price premium can be attributed to the requirement of higher cost of production of organic foods. Whichever side the price premium is coming from, it resulted an increased variety of organic foods for consumers and a larger profit for producers contributing to both sides of the market, and eventually expanding the industry (Oberholtzer, et al., 2005). Although this is apparent, a formal proof of such anecdotal evidence is difficult due to the lack of systematic collection of price data on organic foods. Only recently, some efforts have been made to collect price data (Glaser and Thompson, 2000; Streff and Dobbs, 2004; Oberholtzer et al, 2005), which are primarily based on either farm gate or wholesale prices. Studies on price premium at the retail level remain scanty. It is also likely that the price premium at retail level would be higher than wholesale or farm gate level. Over a decade ago, Thompson (1998) rightfully concluded that insufficient data on the retail price levels of organic foods limits the estimation of price elasticities of organic food items. It is important to collect retail price data on organic foods along with comparable conventional foods to find out the actual price premium paid by the consumers as the entire organic industry is driven primarily by the demand side of the market.

The motivation of conducting this research came from filling up the gaps in the literature as stated above and to add new findings to the body of literature on organic food sales through conventional retail stores. Specifically, this paper makes an effort to find out the overall price premium consumers are to pay while buying organic foods from conventional grocery outlets, and whether there is any variation in price premium among food outlets, food groups and different time periods.

### CONCEPTS AND METHODS

While buying a good, the choice a consumer makes is directly influenced by the relative preference and the market price of both organic and conventional foods. The decision outcome is discrete – to buy an organic product or not. When a consumer does not buy organic, (s)he can either buy conventional or not buy at all. Although the outcome can be categorized in dichotomous choices, the decision process involves few steps. In a neo-classical microeconomic framework, one can explain using consumer preference, budget constraint (in this case price) and derive decisions. A consumer's preference between organic and conventional foods may be presented in the following three options:

- Option 1: Organic is preferred to Conventional
- Option 2: Conventional is preferred to Organic
- Option 3: Organic is indifferent to Conventional

Given the increasing demand and market price of organic foods in the last several decades, Option 2 is an impossibility (there maybe exceptional cases of preferring conventional over organic, but we'll eliminate those as outliers if exists at all), and Option 3 is plausible but is highly unlikely. Option 1 represents the bulk of consumers' preference (if not 100% but nearly so). Assuming the situation in Option 1 and representing price of organic foods, price of conventional foods and price of consumers' reservation with PO, PC and PR, respectively, we can come up with the following outcomes:

Organic is preferred to Conventional and  $PO > PC$ :

- $PO < PR \rightarrow$  Consumers buy Organic
- $PO > PR \rightarrow$  Consumers do not buy Organic
  - $PC < PR \rightarrow$  Consumers buy Conventional, not Organic
  - $PC > PR \rightarrow$  Consumers neither buy Conventional nor buy Organic

Organic is preferred to Conventional and  $PO = PC$ :

- $PO = PC < PR \rightarrow$  Consumers buy Organic
- $PO = PC > PR \rightarrow$  Consumers neither buy Organic nor buy Conventional

The conditions presented above assume that consumers have one common reservation price for both organic and conventional foods. In reality consumers may be willing to pay higher price for organic food than their conventional counterparts. Let us assume two reservation prices, one for organic as  $PR_O$  and the other for conventional as  $PR_C$ , and  $PR_O > PR_C$ . Under such as situation, the condition presented above can be summarized in five possible options:

Organic is preferred to Conventional and  $PO > PC$ :

- $PR_C < PC < PO < PR_O \rightarrow$  Consumers buy Organic, not Conventional
- $PC < PR_C < PO < PR_O \rightarrow$  Consumers either buy Organic or Conventional or both
- $PC < PO < PR_C < PR_O \rightarrow$  Consumer either buy Organic or Conventional or both
- $PC < PR_C < PR_O < PR \rightarrow$  Consumers buy Conventional, not Organic
- $PR_C < PR_O < PC < PR \rightarrow$  Consumer buy neither

This scenario makes more sense in real world. Although individual consumers make dichotomous choices for each product, the market situation becomes continuous as every consumers preference is unique. A survey of 646 consumers in retail grocery stores yielded the result presented in Table 1. On average about 65% of consumers always buy conventional and just less than two percent always buy organic. The rests, over 30% of consumers, buy somewhat mixed – both organic and conventional. Among different food groups, meat and dairy are the most preferred organic.

Table 1 Percent respondents buying proportions of organic and conventional foods from three different grocery stores (organic/conventional)

<b>Organic/Conventional</b>	<b>0/100</b>	<b>20/80</b>	<b>40/60</b>	<b>50/50</b>	<b>60/40</b>	<b>80/20</b>	<b>100/0</b>
<b>Fresh Fruit</b>	51.9	20.9	9.1	5.6	5.4	5.9	1.2
<b>Fresh Vegetables</b>	52.2	19.5	10.1	5.4	5.9	5.7	1.2
<b>Milk / Dairy</b>	76.8	10.1	3.4	3.1	1.4	3.3	2.0
<b>Grains / Cereals</b>	68.4	14.2	4.8	2.9	4.0	3.7	1.9
<b>Prepared Foods</b>	77.9	12.9	2.5	1.5	1.2	2.0	1.1
<b>Meat</b>	66.7	14.7	5.6	4.6	2.9	2.8	2.6
<b>Average</b>	65.6	15.4	5.9	4.0	3.5	3.9	1.7

The decision to buy organic requires that the consumer must prefer organic over conventional food plus the price of the organic food must be within the consumer’s reservation price. The value of preference for organic must be higher than the premium price the consumer has to pay. Alternatively, if a consumer prefers organic but the intensity of preference is not strong enough to compensate for the higher price (s)he has to pay, the consumer will not buy. Under such a situation, the decision of not to buy organic is the result. The decision process is affected by several factors, maybe a simple dichotomous or maybe a combination of several factors. People choose organic foods either for their direct preference toward organic (can be explained by a dichotomous choice) or due to the affinity toward different attributes of organic foods (a relatively complex mechanism to get to the actual decision). Assuming the second but with a simple direct impact, the willingness to pay premium price for organic foods maybe represented as:  $WTP = f(P, L, D, O)$ , where, WTP is the willingness to pay increased (premium over regular) price, P is the vector of perception variables which includes different attributes of organic food for their preference (examples maybe: organic foods are healthier, tasty, superior, environmentally friendly, contain human touch, longer shelf life, non-polluter, etc.), L represents a vector of labeling characteristics as the buyers have to find the utility of labeling and to have confidence in the labeling system, D represents a vector of demographic characteristics (age, education, family size, etc.), and O is a vector of all other attributes not included in the other vectors.

**DATA GATHERING**

This study began with collection and review of relevant literature on the demand side of organic food market, which allowed us to frame the questions of the study and refined the information needed to come up with an analysis to draw conclusion. The two aspects of data gathering were the collection of retail price data and consumers’ shopping behavior data. Five conventional grocery stores – Sobeys, Save-On Foods, Superstores, Safeway and Wal-Mart were approached for allowing us to record the weekly prices of certain organic and conventional food items. The stores were assured that the raw prices or comparative prices among different stores would not be published or disclosed to anyone. Only the normalized and aggregate prices of different food groups would be reported. After repeated requests and with sufficient assurance that the findings would only be used for research purposes and would not be released to anyone, Safeway and

Wal-Mart refused to cooperate. Sobeys, Save-On Foods and Superstores cooperated in allowing us to record their weekly prices and to interview their customers in their respective store premise.

The retail price data for selected organic food items along with their conventional counterparts for a period of seven consecutive weeks were recorded from the three retail grocery stores. Such price data were organized into 13 different food categories. The food categories and the items included into the category are presented in the table below:

1. **Fresh fruits** – Apples, bananas, oranges, grapes, pears, kiwis, cantaloupes, honeydew melons, water melons, strawberries, blueberries, raspberries, mangoes, etc.
2. **Fresh vegetables** – Carrots, green onions, sweet potatoes, cauliflower, celery, romaine lettuce, avocado, white mushrooms, tomatoes, squash, onions, garlics, yams, red potatoes, broccoli, beet bunches, cilantro, head of lettuce, green pepper, yellow pepper, zucchini, English cucumber, etc.
3. **Dry snacks and crackers** – Crackers, chocolate chips, walnut crumbs, cashews, pumpkin seeds, sunflower seeds, popcorn, crystalized ginger, sultan raisins, chocolate almonds, soy nuts, trail mix, fruit and nut mix, almond, popcorn, banana chips, etc.
4. **Rice, wheat and pasta** – pasta, rice, flour, etc.
5. **Breakfast cereals** – cereals, oatmeal, bread, pancake mix, granola, etc.
6. **Sugar, syrup, honey** – syrup, sugar, honey, etc.
7. **Tea and coffee** – coffee and tea.
8. **Canned fruits and vegetables** – tomatoes, beans, peas, etc.
9. **Ready-to-eat canned food** – soups, broths, etc.
10. **Jam, jelly, spread** – preserves, peanut butter, herb paste, jam, jelly, etc.
11. **Salad dressings, ketchups and sauces** – pasta sauce, ketchup, salad dressing, pickles, tomato sauce, pasta sauce, mustard, etc.
12. **Milk and dairy products** – milk, cheese, butter, yogurt, sour cream, cottage cheese, ice cream, etc.
13. **Eggs and egg products** – egg, egg waffles, other egg products

Price data collected for different food items were converted to a uniform unit. The price was calculated for 100 ml for liquid foods and 100 g for solid foods. These were then averaged for each food group. While reporting data, we'll not be mentioning the names of the stores as it was promised to the stores that raw price data will not be presented to any one, instead we'll name as Store 1, Store 2 and Store 3.

## RESULTS AND DISCUSSION

Organic foods are typically produced at small farms with relatively less involvement of technologies. Products from such farms are usually sold at a premium price as their production costs are typically higher and economies of scale are usually absent. Many consumers still prefer organic foods despite the premium price they have to pay for organic foods. The general perception is that organic foods are superior over conventional foods. Most people strongly agree that organic foods are healthier, chemical free, environmentally friendly and better quality.

Price premiums of organic foods observed in the three stores for the seven consecutive weeks are presented in Table 2. On average, organic foods are priced about 69% higher than conventional foods. This was not necessarily due to the demand for organic foods. McLendon (2010) suggested that the production of organic foods costs approximately 30% more due to the fact that organic farms are smaller than conventional firms, yield less and cost more for pest control. Part of the price differential is also due to higher margin. Lukic (2011) concluded that the higher price for organic foods are due to higher input cost and higher margin.

Table 2 Premium price charged for organic foods (in percent) in the three stores for seven week.

Week	Store 1	Store 2	Store 3	Average
1	76.90	57.96	51.29	62.05
2	74.96	59.80	72.29	69.02
3	85.01	60.79	72.44	72.75
4	89.12	63.90	72.38	75.13
5	83.32	57.42	69.40	70.05
6	79.08	58.18	62.24	66.50
7	83.65	54.83	64.26	67.58
<b>Average</b>	<b>81.72</b>	<b>58.98</b>	<b>66.33</b>	<b>69.01</b>

The amount of price differential between organic and conventional is another factor. There are relatively few studies on this. This study find that the on average organic foods are priced about 69% higher than conventional foods with little variation between stores and time periods (among weekly price). The variations among stores are much higher than those among weeks.

Not all foods experience the same price premium. Among the 13 food categories studied, rice, wheat and pasta, and eggs and egg products experienced the highest price premium (over 100%). The lowest price premium was experienced in tea and coffee and breakfast cereals (between 20 and 30%). Kiesel (2012) observed that organic milk is sold for approximately 77% higher price than conventional milk. This study shows a 67% higher price, which is similar to what Kiesel (2012) observed.

Table 3. Price premium (in percent) charged for different categories of organic foods.

No.	Food Groups	Store 1	Store 2	Store 3	Average
1	Fresh fruits	60.71	49.31	30.05	46.69
2	Fresh vegetables	42.54	74.74	38.72	52.00
3	Dry snacks and crackers	114.58	74.22	26.69	71.83
4	Rice, wheat and pasta	151.30	123.21	98.72	124.41
5	Breakfast cereals	19.55	14.49	59.84	31.29
6	Sugar, syrup and honey	143.58	43.68	81.25	89.50
7	Tea and coffee	42.41	12.00	12.99	22.47
8	Canned fruits and vegetables	76.71	109.00	148.53	111.41
9	Ready-to-eat canned foods	89.84	39.37	37.22	55.48
10	Jam, jelly and spread	107.19	24.40	185.48	105.69
11	Salad dressings, ketchups and sauces	105.10	78.30	44.72	76.04
12	Milk and dairy products	67.60	76.64	57.14	67.13
13	Egg and egg products	155.26	87.54	89.54	110.78
<b>Average</b>		<b>81.72</b>	<b>58.98</b>	<b>66.33</b>	<b>69.01</b>

Although not much studies has been done on the direct measure of retail price charged in grocery stores, it is well accepted fact that organic foods are to be sold at higher prices than conventional foods due to production cost as well as consumers’ willingness to pay higher prices. Monier et al (2009) conclude that price differentials between organic and conventional foods have minor

influence on consumer behavior of buying organic foods. In their study, marginal price decrease did not contribute to price elasticities to explain the large price gap.

People's preference toward organic foods can be measured from their actual buying behavior. Only a small number of respondents (less than 2%) always buy organic foods (Table 1), and a vast majority (over 65%) never buy organic. Meat, dairy products and cereals are the types of foods people more inclined to buy organic. These are not necessarily the products where price differentials are less indicating that price plays relatively minor role in consumers' decision to buy organic. This conclusion is in agreement with Monier et al (2009).

It is interesting to note that even though consumers would like to pay more for organic food, the amount is much less than they actually have to pay while buying. Urena et al (2008) observe that organic consumers are normally willing to pay approximately 10% more over the conventional foods. They also find that women are more conservative and are willing to pay less premium price (9.5%) than men are willing (11.4%). Interestingly enough, consumers not buying organic food have higher willingness to pay (15%) with similar differences between men and women (Urena et al. 2008). This may be due to the fact that the response of the consumers buying organic foods is realistic, whereas that of the consumers not buying organic is hypothetical. In other words, the response of the latter group is biased with hypotheticality problem.

There is a huge gap between consumers willing to pay (approximately 10 – 15%, on average) and actual price premium price charged at grocery stores (approximately 25 – 110%). This is indeed contrary to the neoclassical microeconomic thought. Padel and Foster (2005) conclude that customers need more value from organic food to justify the premium price they have to pay while making actual purchase. Although no direct studies pinpoint the reasons of this difference, one can postulate this to the fact that a small number of consumers buy exclusively organic (less than 2%), which is an indication that organic food market is still a niche market and vast majority (over 65%) of consumers do not buy organic at all. On the other hand, those who buy exclusively organic, their preferences are so strong that their emphasis on price is relatively small. Even though the market share of organic food is growing rapidly, it is still minority of consumers who regularly purchase organic. Those who buy organic foods, they have strong preference toward those and are willing to pay premium prices for their attributes, such as, those are fresh, tasty, natural, healthy, chemical free and environmentally friendly and have better nutritional value. They also consider buying organic is supportive of the production process of organic, local and fresh foods.

The amounts of premium prices, however, vary from one store to another, from one food category to another, and from one week to another. On average, organic foods are priced at 62% higher than conventional foods. This is an indication that consumer buying organic are paying on average 62% more than the conventional foods indicating a proxy for revealed preference foods. This suggests that there is a substantial gap between the revealed and the stated preference of consumers regarding organic foods. Monier et al (2009) make an effort to explain the huge price differential using price elasticity of demand after a huge price drop of organic foods. They did not find much price sensitivity and conclude that the organic market expansion is mainly due to consumers' conviction toward organic foods. They hardly notice that how much they actually pay while making purchases.

Organic food market is a niche market and those who buy organic pay a substantially higher premium price. Their actual payment seems to be considerably higher than they think, and they pay higher prices because of the certain attributes of organic foods. Common attributes motivating them to pay higher prices are: organic foods are healthier than conventional foods,

organic foods are tastier than conventional foods, organic foods are of better quality than conventional foods, and organic foods have more human touch than conventional foods. In addition, education level of the consumers plays a significant positive role. Educated people buy more organic than non-educated. Also, consumers are more likely to buy organic if the organic food label contains origin of the product.

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