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# Bad Quality and the Peach Industry: Consumer Reaction to Inferior Produce

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## Abstract

The impact of introducing low quality fruit into the supply chain can have ramifications throughout the value chain. Taking peaches as an example, we utilize a Canada wide online consumer survey to better understand how a low quality purchase will affect a consumers' repurchase from the same producer, packer, retailer, and region. Results indicate that approximately half of respondents showed a lower propensity to repurchase from value chain members, including a decreased propensity to repurchase from the production region selling lower quality fruit. Further, consumer characteristics and behaviors do play a role in how a consumer places blame for lower quality peaches.

**Keywords:** organic, quality, value chain

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## Introduction

Tender fruit, notably peaches, have long been a staple fruit within Canadian agriculture. In 2005, peach production was around 22,748 metric tonnes on a little over 3,000 hectares (Agriculture and Agri-Food Canada 2006). Ontario province makes up most of the production accounting for around 81% of the Canadian volume (Agriculture and Agri-Food Canada 2006). The economic value to Canada is substantial as peaches made up 3% of total farm gate fruit crop value in 2012, while making up as much as 15% of the total farm gate fruit crop value in Ontario (Statistics Canada 2013). Further, Ontario grown peaches maintain a market share between 51% and 79% depending on the season (Deolitte and Touche LLP 2010).

As the peach industry attempts to maintain market share and expand consumption, weaknesses have been noted. Notably, Canadian per capita consumption of peaches from 2008 to 2009 experienced a 17.7% decrease with longer term analysis indicating per capita consumption has remained stagnant at best (Agriculture and Agri-Food Canada 2010). In addition to stagnating to declining demand, competition from other countries has increased with Canada being a major importer of U.S. peaches along with the emergence of Chinese and Chilean product (Integrity Intellectual Property, Inc. 2009). Furthermore, the Ontario industry has experienced inconsistent quality at the consumer level and poor producer, packer, and shipper market orientation (Deloitte and Touche LLP 2010). Marketing boards have been set up to regulate harvest date and maturity, but inconsistent quality remains an issue for peach producers.

Introduction of lower quality peaches into the market can come from human/machine errors in harvesting/post-harvest handling or they could be due to other motives, such as a member of the value chain trying to increase profits or lower shrinkage by cheating on quality. As noted by Winfree and McCluskey (2005), unlike many products, produce is unique in that consumers often do not know the individual producer of the product, but instead rely on a collective reputation of a group of producers. This lack of identity or traceability can provide an incentive for a producer to provide "sub-optimal" quality product compared to the group and free ride on the reputation of the collective (Winfree and McCluskey 2005).

There exists extensive literature associated with supplying optimum quality peaches to consumers, see Crisosto (1989), Crisosto (1994), and Crisosto, Mitchell, and Johnson (1995). Regardless of how and why inferior quality peaches end up on the retail shelf, the consumer forms opinions about the product and subsequently value chain members, notably the producer, packer, and retailer and the production region. Given consumers can only evaluate quality after the purchase has been made, the pre-purchase quality can only be assessed in terms of the probability of being good or bad (Akerlof 1970). Assuming the consumer has a good experience they will have a higher propensity to repurchase. However, the extent to which a consumer repurchases given a "bad" experience is less understood, especially how it relates to repurchasing from the same source. For the purposes of this study, bad quality was considered to be unripe peaches. Therefore, the objective of this paper was to understand whether consumers would have a tendency to repurchase peaches from specific value chain members and the region of production given their preceding purchase of peaches was negative due to a bad quality experience. We anticipate that fruit packers and retailers would be blamed for lower quality compared to producers and the production region given packers and retailers are more likely to

have increased interaction with consumers. Specifically, our hypothesis was that consumers will have varying responses to previous bad quality experiences, notably that the fruit packer and retailer will be held responsible for unripe peaches as opposed to the producer and region. We also examine the role of demographic, purchasing behaviors, and postal code characteristics on the decision to repurchase. Our expectation was that demographics, especially age, income, and gender, and purchase behaviors, purchasing of local and organic, would have a significant impacts on the repurchase decision. Given the role of age and organic purchasing on repurchase, we then simulated how changing age and organic purchases would impact the repurchase decision.

## Data and Methodology

*Data*

This study uses data from a Canada wide online survey sample conducted during Fall 2010. The survey was timed to coincide with when peaches were on the market. The intent of the survey was to gain a better understanding of how the peach purchase decision is made and how decisions by value chain members impact the value chain as a whole. Researchers contracted with a panel provider, Global Market Insite, Inc., to recruit consumers to take the survey. The only limiting question was age, which required respondents to be 18 years of age or older. The survey was divided into three sections depending on whether the respondent had purchased fruit and peaches (have not purchased fruit, purchased fruit but not peaches, purchased fruit and peaches). Respondents having not purchased fruit and/or peaches were given a slightly different survey (e.g. focused on reasons for not purchasing) than the peach purchasing group (e.g. focused on peach purchasing behavior). Notably, respondents that had not purchased fruit were asked to indicate why they had not purchased fruit during the last four months (such as allergic, too expensive, not available where shop, do not like taste, grow my own, someone else purchases, etc.), while respondents having purchased fruit but not peaches were asked to indicate why they had not purchased peaches (such as allergic, too expensive, not available where shop, do not like taste, do not like fuzz on peach skin, grow my own, someone else purchases, etc.).

The primary reason respondents had not purchased fruit was due to someone else purchasing, whereas lack of peach purchasing was most likely due to disliking the taste or the fuzzy skin. Respondents that had purchased both fruit and peaches were the primary group of interest for this study. A total of 1,469 consumers from across Canada were invited to participate in the study with 891 completed responses, representing a response rate of 61%. Of the 891 completed surveys, 3.4% did not purchase any fruit, 13.9% purchased fruit excluding peaches and 82.7% purchased fruit and peaches. The survey consisted of a variety of questions relating to demographic (e.g. age, gender, ethnic heritage, etc.), socio-economic (e.g. income), purchasing behavior (percent of food purchases that were local and organic), food attitude questions (e.g. does food matter?), and a conjoint section on peach products. Respondents also provided their postal code which was linked with 2006 Canadian Census records so as to provide key information (e.g. population density, median age, median income, etc.) about where they lived. In regard to representativeness as compared to the Canadian Census, our sample had a similar average household income of $60,949 (2010 Statistics Canada estimate - $69,860). A direct comparison of average age (study - 48.5 vs. census - 39.7 years) is not feasible given the average

census age takes into account the 22% of consumers under 18 years of age which were not a part of this study. Removing the under 18 age group from the census calculations, would make the average age of the sample similar to that of the census. Also, this study has a 60/40 female/male ratio, which is different from the 50/50 ratio found in the census. However, given women have been shown to be the major shopping group (Zepeda 2009; Flagg et al. 2013; Wolfe 2013), our survey oversampled women in order to be more representative of the actual shopping environment.

In order to assess the repurchase intent across value chain members, consumers were asked their likelihood of purchasing their next container of fresh whole peaches from the *same* source, such as a producer, packer, grocery store/farmer's market, and production region, given their *last purchase* was of bad quality due to being unripe. Producer, packer and grocery store/farmer's market are somewhat obvious points in the value chain, but region was included since firms selling a regional or specialty product often share a common or collective reputation, which is based on the group's aggregate quality (Landon and Smith, 1998; Winfree and McCluskey 2005). Based on the scenario given we were examining the effect if the previous peach purchasing experience was negative, so our results do not indicate how long-term positive and negative experiences would impact the consumer's decision.

A 7-point itemized semantic differential scale was used to measure the consumer's intention to purchase again after the initial bad quality purchase where 1 = "definitely would not purchase," 4 = "may or may not purchase," 7 = "definitely would purchase, and 2, 3, 5, and 6 are intermediate values of willingness to purchase again from the same source. This question is hypothetical in nature and does not purport to exactly measure whether they will repurchase. For instance, a consumer may say they will not purchase again from a producer, but in reality they may not know the producer or have the option of another producer; however, this question allows us to gain some insight into whom the consumer blames for the initial bad quality purchase. From these results we can gain some key insights into the purchasing decision as well as providing recommendations for the peach industry.

*Empirical Methods*

Given consumers were asked to rate their likelihood of re-purchasing whole fresh peaches from the same source on a 1 to 7 differential scale, the ordered nature of the categories must be accounted for in the analysis. Therefore, we utilized an ordered logit model (OLM) to analyze the producer, packer, retailer, and region models separately. The OLM assumes we observe y via the scale ratings, however, there is a continuous, unmeasured latent variable y* that dictates the value of y. Thus, the value of y is

$$(1)\quad y_i = j \text{ if } \tau_{j-1} \leq y_i^* < \tau_j \text{ for } j = 1 \text{ to } 7$$

where $\tau$ is the threshold between the scale ratings and j is the scale values. Furthermore, the log likelihood can be defined as

$$(2)\quad \ln L(\beta, \tau \mid y, x) = \sum_{j=1}^{7} \sum_{y_i=1} \ln[F(\tau_j - x_i\beta) - F(\tau_{j-1} - x_i\beta)]$$

where $\beta_0 = 0$ and F(.) is defined as

$$(3)\ F(.) = \frac{\exp(.)}{1+\exp(.)}$$

with the error term having a logistic distribution zero mean and $\pi^2/3$ variance (Long, 1997). Equation 2 can then be maximized to get estimates for $\beta$ and $\tau$. As noted by McFadden (1986) many factors (e.g. demographics, habits, experience, and attitudes) can contribute to the purchase decision. Thereby, x represents a set of explanatory variables consisting of demographic (i.e. income, education, married/partner, age, adults and children in household, gender, length of time lived in Canada, and ethnic heritage), purchase behavior (i.e. primary shopper, primary shopping outlets, percent organic food purchases, percent local food purchases, and amount of fruit budget spent on peaches), attitudes (i.e. whether food matters and whether food is of interest), and postal code characteristics (i.e. live in fruit producing region, median income, median age, population density, population change, household size, and percent visible minority).

A core assumption of the OLM is the satisfaction of the proportional odds assumption. Results of Brant's (1990) test indicated that we failed to reject our null hypothesis of having proportional odds; thereby, implying the OLM is an appropriate econometric technique for our data. Furthermore, we found statistical difference between the thresholds, indicating that the seven categories cannot be reduced.

To further explore how consumers react to inferior quality produce, we utilized the predicted probabilities in order to observe changes in purchasing behaviors and their effect on willingness to repurchase from a previous supplier. We focused on the purchasing age and organic purchasing of peaches as the OLM results indicated these variables impacted consumers' purchasing behavior. Predicted probabilities associated with every observed outcome can be found by calculating:

$$(4)\ \Pr(y_i = j|x_i) = F[(\tau_j - x_i\beta) - F(\tau_{j-1} - x_i\beta)]$$

where $\tau$ is the threshold, $x_i$ is a set of explanatory variables, $\beta$ being the coefficients from equation 2, and F(.) taking the form given in equation 3 (Long 1997).

## Results and Discussion

One of our main hypotheses was that consumers will have varying responses to previous bad quality experiences, notably that the fruit packer and retailer will be held more responsible than the producer and region. Examining Table 1 we see that the distribution of responses of peach repurchasing shows fairly consistent results across the value chain. For instance, the results indicate that only 2% of consumers definitely would repurchase from the same packer, with another 7% and 3% indicating they would fall in the range between "may or may not" and "definitely would" repurchase. However, 5%, 6% and 14% of respondents marked a response (i.e. either, 5, 6, or 7 on the scale) in the would repurchase part of the scale. Around 30-40% of consumers indicated they "may or may not" repurchase from the same source/region (scale

rating of 4). Thus, approximately one-half of consumers are undecided or have a high propensity to repurchase from the same source (i.e. marked 4, 5, 6, or 7 on the scale).
Approximately half of consumers indicated that they would be less inclined to purchase from the value chain members again. For retailers, who can directly be identified since they are the consumer's point of contact, 18% said they would "definitely not purchase" from them again (Table 1). Based on the results above, retailers would be directly impacted by their own decisions (e.g. introducing unripe peaches to the market) as well as decisions by producers and packers/processors (e.g. incorrect postharvest practices) given harvesting decisions at any level of the value chain will impact the retailer. Also of interest is that 34% of the sample (14%+9%+11%) had a tendency to not purchase peaches from the same region again (Table 1). Even though this is a lower percentage than for producers, packers, and retailers, it is still a sizable portion of the market, especially given the competition from U.S., Chinese, and Chilean peaches. From these results it is clear that a single producer, packer, or retailer can have a large impact on the collective reputation of the region if they introduce unripe peaches to market. Based on consumption trends and the highly competitive nature of the peach market, losing small amounts of consumers could be a major setback for the local industry.

**Table 1.** Consumer Willingness to Purchase Peaches from a Value Chain Member after a Bad Purchase Experience

| | | Supplier (Purchased from) | | | |
|---|---|---|---|---|---|
| **Peaches** | **Differential Scale** | **Producer** | **Packer** | **Retailer** | **Region** |
| Definitely not | 1 | 24% | 24% | 18% | 14% |
| | 2 | 15% | 16% | 12% | 9% |
| | 3 | 13% | 15% | 13% | 11% |
| May or may not | 4 | 33% | 33% | 36% | 40% |
| | 5 | 8% | 7% | 13% | 14% |
| | 6 | 4% | 3% | 4% | 6% |
| Definitely would | 7 | 3% | 2% | 4% | 5% |
| N | | 737 | | | |

**Notes:** [a] Scale used was a 1-7 itemized semantic differential scale where 1="Definitely would not purchase," 4="May or may not purchase," and 7="Would purchase," with 2, 3, 5 and 6 being intermediate responses.

On the whole, we reject our hypothesis that packers and retailers would be held more responsible for bad quality as producers and to a lesser extent the production region share blame. Our findings do provide interesting points for the industry. Currently, consumers most likely have asymmetric information about producers and packers, such that they may not know the name of the producer or packer. However, new campaigns are being implemented to link producer with consumer, such as increased food traceability and know your farmer campaigns. As these campaigns become more embedded in the food system, our results allow the value chain to see the potential effect of offering inferior quality to the consumer.

The results of Table 1 do invite a critical question, are there certain consumer characteristics that may lead a consumer to blame a specific value chain member and not others? This question leads to our second hypothesis that demographics (notably age, income, and gender) and purchase behaviors (local and organic purchasing) would have significant impact on the repurchase decision. Using the OLM models we evaluated this hypothesis.

Initial examination of the results from the OLM model indicate that there were significant Wald $\chi^2$ values across models and that the Brant test failed to reject that the proportional odds assumption for all models (Table 2, see Appendix). Furthermore, each category threshold was significantly different from the next, implying categories should not be condensed.

*Demographic Variables*

With regard to the question whether consumer characteristics play a role in a consumers' repurchasing of peaches given a previous bad experience, we found certain consumer characteristics were indicators of consumers' tendencies to repurchase (Table 2). Examining our demographic variables of interest, we found that age had a significantly negative effect on how bad quality impacted the repurchase decision. For instance, as age increased, the ordered log-odds of being in a higher category (i.e. repurchasing) decreased between -0.026 and -0.014 depending on the value chain member. In other words, older consumers had a decreased propensity of repurchasing from a value chain member after experiencing bad quality. However, income and gender had no effect on the decision to repurchase. This is somewhat surprising as we would expect consumers that are female or that have more income to shift away from the peach product/brand that gave them a negative experience to peaches from other suppliers/regions.

With respect to the other demographics, we find that education, number of adults in the household, and Asian heritage impact repurchasing from producers, while education, number of adults, and Asian heritage effect packer sourcing. For instance, being of Asian heritage compared to Canadian heritage increased the ordered log-odds by 0.402 and 0.457 of being in a higher category for repurchasing from a producer and packer, respectively. This implies that Asian heritage consumers have an increased propensity for purchasing from the same producer and packer after a bad quality experience. Older consumers, on the other hand, are less likely to be in a higher category (of repurchase) from "bad quality" producers (-0.014) or packer (-0.026). For retailers we see no significant factor other than age, while for production region we only find number of adults in household as being a significant demographic influence. Given only limited demographic variables are significant across models, we can only partially fail to reject our hypothesis that demographics play a role in the repurchasing decision after experiencing bad quality. Our results do, however, offer key insights since we found a couple of significant demographic variables. Based on our findings it is clear that value chain members need to be acutely aware of the demographics they are servicing. As such peaches headed to certain clientele markets (e.g. older consumers) should probably be tested more thoroughly for ripeness than peaches headed to other markets in order to insure that fewer unripe peaches make it to the retail shelf.

*Purchase Behavior Variables*

The second part of our hypothesis was that purchasing behaviors would play a key role in the decision to purchase peaches after a bad quality experience. With respect to this part of the hypothesis, we see our biggest findings. First, as consumers purchase increasing amounts of locally produced food, there is no effect on their likelihood of repurchasing from anyone in the value chain after a bad experience (Table 2). Our expectation was that consumers that purchase

increased amounts of local food might be more tuned in to the dynamic nature of peaches, thereby being more amenable to a bad peach quality experience. However, our findings indicate there is no effect from increased purchasing of locally produced foods. In contrast, consumers that purchase increased amounts of organic food have a tendency to repurchase from all members of the value chain. This is most likely due to organic buyers either being more exposed to quality issues or they are more in tune to the dynamic nature of peaches (and most likely produce in general). Thus, organic buyers seem to be a little more forgiving for lower quality peaches than consumers purchasing less organic food.

Also of note, where a respondent primarily shops did not impact the likelihood of purchasing again from any value chain member. We anticipated that consumers shopping at farmers' markets would be more forgiving than consumers shopping at large chain stores, but we found that retail outlet had no effect on how likely consumers were to repurchase peaches from a value chain member or production region.

*Attitude and Postal Code Variables*

With regard to food attitudes and purchasing behavior, there are some interesting findings (Table 2). First, consumers saying "food is increasingly important to them" have lower likelihoods of purchasing again from the packer (-0.191), while not effecting the repurchase decision for any other value chain member or region. However, we see that as the percent of peach expenditures makes up an increasing amount of the fruit budget a consumer is more likely to repurchase from a producer and packer after a negative experience.

In examining the postal code characteristics, the most important finding surrounds the density per square km variable. A 100 person increase in population per square km results in a statistically significant reduction (-0.01) in the ordered log odds of repurchasing from the same retail store. A potential explanation for this revolves around rural consumers' potentially having a better understanding of the dynamic nature of peaches, such as the ripening cycle of peaches. However, the implication for retailers in more urban areas is that their customers are potentially more sensitive to lower quality than their more rural counterparts. Enacting more stringent testing policies or testing programs in-store could lead to less unripe peaches reaching consumer hands.

*Simulations*

Based on the results above, we investigated how changes in age and organic purchasing would impact willingness to repurchase across value chain members holding all other variables constant at their mean. Predicted probability outcomes were assigned to a differential scale category. As shown in Table 3 (see Appendix), older consumers are more likely to fall in a less likely to repurchase category. For instance, as consumer age moves from 20 to 65, holding all other variables constant, the percentage of consumers falling into the "definitely would not purchase" category doubles for each value chain member. The reason for this could stem from older consumers having more experience in purchasing peaches and, thereby, having an expectation that peaches should be of good quality.

Increased amounts of organic purchasing, holding other variables constant, shifts consumers from not willing to repurchase to moderate points on the scale and even gains in willingness to repurchase (Table 4, see Appendix). For instance, examining the producer model results at the 5% organic purchasing level indicates that 56% (25% + 17% + 14%) of consumers have a lower propensity of repurchasing peaches after a bad experience. When looking at the 95% of organic purchasing level, holding all other variables constant, only 38% are in the not willing to repurchase portion of the differential scale. The packer, retailer, and region models show the same shift, consumers purchasing more organic fruit tend to be more willing to repurchase from the same producer, packer, retailer, and region that sold them bad quality peaches in their last purchase occasion.

## Conclusions

Based on the evidence of this study, our results suggests that the peach value chain and production region are intertwined such that actions of one member can harm the rest of the value chain and even the collective reputation of the region. Even though everyone can be harmed through bad quality, the regional label tends to be hurt the least compared to producers, packers, and retailers. However, the region is blamed by a fairly large percentage of consumers, which given the competitive nature of the produce industry can have important impacts.

Furthermore, we do see that certain characteristics and behaviors do drive how a consumer will react to a previous low quality preach purchase. Some characteristics and behaviors affect all value chain members, such as age and organic purchasing, while other characteristics affect only certain value chain members, such as Asian heritage, food matters, and some college education.

Even though the results of this survey are directly applicable to the peach industry, it is logical that a direct parallel can be drawn to other fruits and vegetables. Our results offer several applicable insights. Notably, value chain members need to be aware that their decisions matter and the impact of introducing bad quality product onto the market, either intentionally, or unintentionally, will directly depend on the characteristics of the final consumer. By incorporating more intense quality checks, such as insuring ripeness is at an acceptable level, value chain members can protect their reputation and the reputation of their regional brand. Many fruit products, peaches included, have quality standards around ripeness. Standards such as these should be monitored and improved depending on the market where the product will be sold. Also, our results indicate that value chain members need to work together to validate quality, as quality mistakes made by a value chain member can affect everyone within the value chain.

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# Appendix

**Table 2.** Log-likelihoods from the Ordered Logit Model by Value Chain Member.

| Variable | Producer | | Packer | | Retailer | | Region | |
|---|---|---|---|---|---|---|---|---|
| | Coeff. | *p-value* | Coeff. | *p-value* | Coeff. | *p-value* | Coeff. | *p-value* |
| **Income** | -0.000 | *0.672* | -0.000 | *0.355* | -0.000 | *0.341* | -0.000 | *0.285* |
| **Education:**(base = college or less) | | | | | | | | |
| Some college | **-0.485** | *0.019* | **-0.504** | *0.015* | -0.315 | *0.119* | -0.086 | *0.669* |
| Bachelor's degree | -0.336 | *0.156* | -0.371 | *0.126* | -0.344 | *0.157* | 0.072 | *0.759* |
| Above Bachelor's | -0.285 | *0.258* | -0.272 | *0.261* | -0.117 | *0.611* | 0.031 | *0.893* |
| **Married/Partner:** (1 = yes) | -0.236 | *0.189* | -0.101 | *0.576* | -0.016 | *0.928* | 0.005 | *0.975* |
| **Age** | **-0.014** | *0.030* | **-0.026** | *0.000* | **-0.024** | *0.000* | **-0.022** | *0.000* |
| Persons ≥18 years in household | **0.135** | *0.057* | **0.132** | *0.071* | 0.111 | *0.165* | **0.206** | *0.007* |
| Persons <18 years in household | 0.120 | *0.177* | 0.000 | *0.997* | -0.026 | *0.774* | -0.045 | *0.633* |
| **Gender:** (1 = Male) | -0.080 | *0.617* | -0.056 | *0.726* | -0.001 | *0.996* | 0.016 | *0.914* |
| **Ethnic heritage:** (base = Canadian) | | | | | | | | |
| European | 0.020 | *0.906* | -0.039 | *0.812* | -0.087 | *0.613* | 0.092 | *0.589* |
| Asian | **0.402** | *0.094* | **0.457** | *0.068* | 0.162 | *0.480* | 0.074 | *0.753* |
| Other ethnic heritage | 0.070 | *0.800* | -0.159 | *0.539* | -0.165 | *0.538* | -0.359 | *0.218* |
| **Primary household shopper (1 = yes)** | -0.139 | *0.388* | 0.006 | *0.972* | 0.002 | *0.988* | 0.112 | *0.474* |
| **Retail outlet primarily shop** (choose all that apply question) | | | | | | | | |
| Large chain store | -0.021 | *0.906* | 0.018 | *0.920* | -0.031 | *0.863* | 0.004 | *0.982* |
| Independent store | 0.196 | *0.192* | 0.202 | *0.187* | 0.186 | *0.231* | 0.151 | *0.303* |
| Discount store | -0.026 | *0.906* | -0.059 | *0.790* | 0.041 | *0.853* | 0.276 | *0.226* |
| Farmers' market | 0.045 | *0.776* | -0.036 | *0.813* | 0.146 | *0.347* | 0.165 | *0.275* |
| Other | -0.022 | *0.903* | -0.041 | *0.822* | -0.088 | *0.632* | 0.079 | *0.684* |
| **Live in major fruit production region** *(1 = no)* [a] | 0.161 | *0.368* | -0.067 | *0.714* | -0.064 | *0.722* | 0.016 | *0.931* |
| Food matters to me [b] | -0.149 | *0.158* | **-0.191** | *0.076* | -0.098 | *0.346* | 0.010 | *0.919* |
| Food interest to me [b] | -0.089 | *0.362* | -0.088 | *0.350* | 0.013 | *0.891* | -0.016 | *0.871* |

**Table 2.** *Continued*

| Variable | Producer | | Packer | | Retailer | | Region | |
|---|---|---|---|---|---|---|---|---|
| | Coeff. | *p-value* | Coeff. | *p-value* | Coeff. | *p-value* | Coeff. | *p-value* |
| Percent food purchases locally produced | 0.002 | *0.439* | 0.001 | *0.674* | -0.002 | *0.599* | 0.003 | *0.415* |
| Percent food purchases organically produced | **0.008** | *0.083* | **0.008** | *0.070* | **0.008** | *0.030* | **0.009** | *0.021* |
| Length of time lived in Canada (years) | 0.008 | *0.734* | 0.006 | *0.776* | -0.011 | *0.562* | -0.014 | *0.505* |
| Spending dollar ratio: percent peach/fruit | **0.036** | *0.006* | **0.025** | *0.056* | 0.019 | *0.149* | 0.019 | *0.121* |
| **Postal code characteristics** | | | | | | | | |
| % Population change from 2001 to 2006 | 0.010 | *0.427* | 0.008 | *0.512* | 0.006 | *0.618* | 0.018 | *0.122* |
| Population density per square km [c] | -0.004 | *0.458* | -0.006 | *0.267* | **-0.010** | *0.056* | -0.060 | *0.286* |
| Median age | -0.017 | *0.424* | -0.034 | *0.135* | **-0.054** | *0.020* | -0.017 | *0.559* |
| Median after tax income | -0.000 | *0.449* | -0.000 | *0.921* | 0.000 | *0.828* | 0.000 | *0.945* |
| Average household size | -0.365 | *0.308* | -0.533 | *0.158* | -0.425 | *0.232* | -0.450 | *0.213* |
| Percent visible minority | **-0.199** | *0.040* | -0.126 | *0.160* | -0.010 | *0.918* | -0.040 | *0.696* |
| | **Cut point** | ***p-value*** | **Cut point** | ***p-value*** | **Cut point** | ***p-value*** | **Cut point** | ***p-value*** |
| Cut point 1 vs. Cut point 2 | -23.7 | | -18.5 | | -7.3 | | -7.8 | |
| Cut point 2 vs. Cut point 3 | -23.0 | *0.000* | -17.7 | *0.000* | -6.6 | *0.000* | -7.1 | *0.000* |
| Cut point 3 vs. Cut point 4 | -22.4 | *0.000* | -17.0 | *0.000* | -6.0 | *0.000* | -6.6 | *0.000* |
| Cut point 4 vs. Cut point 5 | -20.6 | *0.000* | -15.1 | *0.000* | -4.3 | *0.000* | -4.7 | *0.000* |
| Cut point 5 vs. Cut point 6 | -19.7 | *0.000* | -14.0 | *0.000* | -3.2 | *0.000* | -3.7 | *0.000* |
| Cut point 6 vs. Cut point 7 | -18.7 | *0.000* | -13.1 | *0.000* | -2.4 | *0.000* | -2.9 | *0.000* |
| Number | 737 | | 737 | | 737 | | 737 | |
| log pseudo likelihood | -1203.0 | | -1165.7 | | -1241.2 | | -1220.0 | |
| Wald $chi^2$ | 85.41 | *0.000* | 82.82 | *0.000* | 80.25 | *0.000* | 79.59 | *0.000* |
| Brant test of proportional odds assumption | 155.2 | *0.481* | 166.9 | *0.243* | 139.7 | *0.805* | 171.3 | *0.176* |

**Notes:** [a] Major production regions for Canadian produce include Ontario and British Columbia, so we defined major production regions as consumers living in Ontario or British Columbia.

[b] Represents values on a 7-point itemized semantic differential scale where 1 = disagree and 5 = agree.

[c] Multiplied by 100, implying an increase in 100 people per sq. km decreases the ordered log odds by -0.010

**Table 3.** Percentage of Consumers Willing to Purchase Again from Specific Value Chain Members (on 1-7 scale) Based on Predicted Probabilities from Changing Age, Holding All other Variables Constant.

| | **Definitely Would Not** | | | **May or May Not** | | | **Definitely Would** |
|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| *Age* | | | *Purchase Again from Same Producer* | | | | |
| 20 | 17% | 12% | 13% | 41% | 10% | 4% | 3% |
| 25 | 18% | 13% | 14% | 40% | 9% | 4% | 3% |
| 30 | 19% | 14% | 14% | 39% | 9% | 4% | 3% |
| 35 | 20% | 14% | 14% | 38% | 8% | 4% | 2% |
| 40 | 22% | 15% | 14% | 37% | 8% | 3% | 2% |
| 45 | 23% | 15% | 14% | 36% | 7% | 3% | 2% |
| 50 | 25% | 16% | 14% | 34% | 7% | 3% | 2% |
| 55 | 26% | 16% | 15% | 33% | 6% | 3% | 2% |
| 60 | 28% | 16% | 14% | 32% | 6% | 2% | 2% |
| 65 | 29% | 17% | 14% | 31% | 6% | 2% | 1% |
| | **Definitely Would Not** | | | **May or May Not** | | | **Definitely Would** |
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| *Age* | | | *Purchase Again from Same Packer/Processor* | | | | |
| 20 | 13% | 12% | 14% | 44% | 10% | 5% | 3% |
| 25 | 15% | 12% | 15% | 42% | 9% | 4% | 3% |
| 30 | 17% | 13% | 16% | 41% | 8% | 4% | 2% |
| 35 | 18% | 14% | 16% | 39% | 7% | 3% | 2% |
| 40 | 20% | 15% | 16% | 37% | 6% | 3% | 2% |
| 45 | 22% | 16% | 17% | 36% | 6% | 3% | 2% |
| 50 | 24% | 17% | 17% | 34% | 5% | 2% | 1% |
| 55 | 27% | 17% | 17% | 32% | 5% | 2% | 1% |
| 60 | 29% | 18% | 16% | 29% | 4% | 2% | 1% |
| 65 | 32% | 18% | 16% | 27% | 4% | 2% | 1% |

**Table 3.** *Continued*

| | Definitely Would Not | | | May or May Not | | | Definitely Would |
|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| *Age* | | | | *Purchase Again from Same Retailer* | | | |
| 20 | 15% | 12% | 14% | 42% | 9% | 5% | 3% |
| 25 | 16% | 13% | 15% | 41% | 8% | 5% | 3% |
| 30 | 18% | 13% | 15% | 40% | 7% | 4% | 2% |
| 35 | 20% | 14% | 16% | 38% | 7% | 4% | 2% |
| 40 | 22% | 15% | 16% | 37% | 6% | 3% | 2% |
| 45 | 24% | 16% | 16% | 35% | 5% | 3% | 2% |
| 50 | 24% | 16% | 16% | 35% | 5% | 3% | 2% |
| 55 | 26% | 16% | 16% | 33% | 5% | 3% | 1% |
| 60 | 28% | 17% | 16% | 31% | 5% | 2% | 1% |
| 65 | 30% | 17% | 16% | 29% | 4% | 2% | 1% |
| *Age* | | | | *Purchase Again from Same Region* | | | |
| 20 | 8% | 5% | 8% | 44% | 17% | 9% | 8% |
| 25 | 9% | 6% | 9% | 44% | 16% | 8% | 8% |
| 30 | 11% | 6% | 10% | 44% | 15% | 8% | 7% |
| 35 | 12% | 7% | 10% | 44% | 14% | 7% | 6% |
| 40 | 13% | 8% | 11% | 44% | 13% | 6% | 5% |
| 45 | 15% | 8% | 12% | 44% | 12% | 6% | 5% |
| 50 | 16% | 9% | 12% | 43% | 11% | 5% | 4% |
| 55 | 18% | 9% | 13% | 42% | 10% | 5% | 4% |
| 60 | 20% | 10% | 13% | 40% | 9% | 4% | 3% |
| 65 | 22% | 11% | 14% | 39% | 8% | 4% | 3% |

**Table 4.** Percentage of Consumers Willing to Purchase Again from Specific Value Chain Members (on 1-7 scale)
Based on Predicted Probabilities from Changing the Percent of Organic Fruit Purchased, Holding All Other Variables Constant.

| | **Definitely Would Not** | | | **May or May Not** | | | **Definitely Would** |
|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| *% Organic Purchases* | | | *Purchase Again from Same Producer* | | | | |
| 5 | 25% | 17% | 14% | 33% | 6% | 3% | 2% |
| 15 | 23% | 16% | 14% | 34% | 7% | 3% | 2% |
| 25 | 22% | 16% | 14% | 35% | 7% | 4% | 2% |
| 35 | 20% | 15% | 14% | 36% | 8% | 4% | 3% |
| 45 | 19% | 15% | 14% | 37% | 8% | 4% | 3% |
| 55 | 18% | 14% | 13% | 38% | 9% | 5% | 3% |
| 65 | 17% | 14% | 13% | 39% | 9% | 5% | 3% |
| 75 | 16% | 13% | 13% | 40% | 10% | 5% | 3% |
| 85 | 15% | 12% | 13% | 40% | 11% | 6% | 4% |
| 95 | 14% | 12% | 12% | 41% | 11% | 6% | 4% |
| *% Organic Purchases* | | | *Purchase Again from Same Packer/Processor* | | | | |
| 5 | 25% | 18% | 16% | 33% | 6% | 2% | 1% |
| 15 | 23% | 17% | 16% | 34% | 6% | 2% | 1% |
| 25 | 22% | 17% | 16% | 35% | 6% | 2% | 2% |
| 35 | 21% | 16% | 16% | 36% | 7% | 2% | 2% |
| 45 | 19% | 16% | 15% | 37% | 7% | 3% | 2% |
| 55 | 18% | 15% | 15% | 39% | 8% | 3% | 2% |
| 65 | 17% | 15% | 15% | 40% | 8% | 3% | 2% |
| 75 | 16% | 14% | 15% | 41% | 9% | 3% | 2% |
| 85 | 15% | 14% | 15% | 42% | 9% | 3% | 2% |
| 95 | 14% | 13% | 14% | 42% | 10% | 4% | 3% |

**Table 4.** *Continued*

| | Definitely Would Not | | | May or May Not | | | Definitely Would |
|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| *% Organic Purchases* | | | *Purchase Again from Same Retailer* | | | | |
| 5 | 19% | 13% | 14% | 36% | 12% | 3% | 3% |
| 15 | 17% | 12% | 13% | 37% | 12% | 4% | 4% |
| 25 | 16% | 12% | 13% | 38% | 13% | 4% | 4% |
| 35 | 15% | 11% | 13% | 38% | 14% | 4% | 4% |
| 45 | 14% | 11% | 12% | 39% | 15% | 5% | 5% |
| 55 | 13% | 10% | 12% | 39% | 16% | 5% | 5% |
| 65 | 12% | 10% | 12% | 40% | 16% | 5% | 5% |
| 75 | 11% | 9% | 11% | 40% | 17% | 6% | 6% |
| 85 | 11% | 9% | 11% | 40% | 18% | 6% | 6% |
| 95 | 10% | 8% | 10% | 40% | 19% | 7% | 7% |
| *% Organic Purchases* | | | *Purchase Again from Same Region* | | | | |
| 5 | 15% | 10% | 12% | 42% | 12% | 5% | 4% |
| 15 | 14% | 10% | 11% | 43% | 13% | 5% | 4% |
| 25 | 13% | 9% | 11% | 43% | 14% | 5% | 5% |
| 35 | 12% | 8% | 11% | 43% | 15% | 6% | 5% |
| 45 | 11% | 8% | 10% | 43% | 16% | 6% | 6% |
| 55 | 10% | 7% | 10% | 43% | 17% | 7% | 6% |
| 65 | 9% | 7% | 9% | 43% | 18% | 7% | 7% |
| 75 | 8% | 6% | 9% | 43% | 19% | 8% | 8% |
| 85 | 8% | 6% | 8% | 42% | 19% | 9% | 8% |
| 95 | 7% | 6% | 8% | 42% | 20% | 9% | 9% |