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Title:

The Most Important Food Labels among Online Shoppers when Shopping for Fresh Produce

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Abstract

Online shopping is increasingly becoming a common shopping venue for young generations of consumers. However, preferences for fresh produce among those who frequently shop online are still unclear. This study explains food labels that online shoppers consider most important when shopping for fresh produce. This study uses data collected from a stratified randomly selected sample of 1,205 online shoppers within the South region of the U.S. who made at least two online purchases within six months prior to participating in this study. We collected data in 2016 through the Qualtrics actively managed market research panels and those using social media such as Facebook and Twitter. Results show that 81 percent of online shoppers actually believe that food labels are very important to them. The most important label for the majority (49 percent) of those who believe so is “grown locally”. Those whose “organic” label is the most important constitute 15 percent. We found that 30 percent consider a combination of locally and organically grown fresh produce to be the most important to them. Only six percent of online shoppers have other labels they consider the most important. The most common important labels among this group include nutrition contents, price, and country of origin. This study is significant to fresh produce growers and agricultural marketers because it provides an explanation of food labels those online shoppers consider to be the most important when shopping for fresh produce. It is significant to food products regulators who are interested in enforcing regulations related to food labels. Future researchers will find this analysis useful when furthering knowledge about this increasingly popular market.

online shoppers.

Keywords: food labels, online shoppers, multinomial logit

1. Introduction

Food labels play a very important role in determining consumers’ decision to buy food products. In particular, local and organic food labels have become increasingly important to consumers. This stems from the locavore movement, the desire to eat healthier, and wanting to know the origins of the food. In recent years, online shopping has also become important to many consumers who are health conscious. According to Hsu and Chen (2011) the primary motivation for shopping online for food was to eat healthier. If consumers are most concerned with eating healthy, then which food label among local, organic, both, or other, is the most important? Other studies have determined that food labels like local and organic do impact the purchasing decision that consumers make (Chen, 2015; Lang, et al., 2014; Lee, et al., 2013).

Unlike previous studies, this study will focus primarily on the preferences of online shoppers, those who have made two online purchases within six months prior to participating in this study. This study describes the characteristics of online shoppers, explains the likelihood of considering food labels when purchasing food products, and determine relative probabilities for a specific food label to be the most important to online shoppers. The study identifies and

explains consumer characteristics that have significant effects on preferences for foods labeled local, organic, or both relative to any other food label.

This study is significantly pertinent to those in the agriculture community. It focuses on the increasingly popular trends in the local agriculture community, the locavore, and organic movement. This study is also directed towards online shopping, which is becoming an increasingly popular market outlet for food products. The research and findings of this study are important for food growers, processors, and agricultural marketers/sellers. Knowing whether food labels are a factor for online shoppers when making purchasing decisions is important for these folks. Likewise, the knowledge about the most important food labels and the consumer characteristics with significant effects is vital for them.

2. Literature Review

Online shopping has become increasingly popular for several reasons. Hsu, et al., (2011) found that the main reasons for shopping online are convenience, safety, health related reasons, and the variety of food products in the online market. Other studies also posited that several consumers shop online because it is convenient for their lifestyle (Lian, et al., 2014; Al Karim, 2013). The health and environmental benefits surrounding “local” and “organic” labels make online shopping for food a unique opportunity for both producers and consumers.

Are consumers willing to pay more for a product because it is labeled local, organic, or both? According to Zhang et al., (2016); Van Loo et al., (2011); Sackett et al., (2016); De-Magistris et al., (2016); and Curtis, et al., (2014) consumers are willing to pay more for their preferred label. In a study performed on the University of Connecticut, it was found that college students were willing to pay 1-2% more for local and organic food (Bruno, et al. 2016). A study performed in Tennessee by Baryeh, et al. (2015) found that over 75 percent of consumers were willing to pay at least a little more for produce that was labeled “organic”. Another study by Larceneux, et al. (2012) stated that when the labels “local” and “organic” are both offered most people value locally grown food over organic foods. Other studies have found that consumers particularly in the United States prefer local food and are willing to pay significantly more for food labeled “local” (Byrd, et al. 2017). Contrarily; a different study performed in the northeast United States found that consumers were willing to pay more for food labeled “organic” rather than “local” (Chen, 2015). Heng, et al. (2016) reported that too many labels can actually discourage consumers from purchasing products. There are many factors that contribute to the willingness to pay more for organic and local foods such as environmental concern, income, and knowledge of a product.

Who exactly is purchasing foods that are labeled “local” and “organic”? Baryeh, et al. (2015), Cholette, et al. (2013), and Oraman (2014) found that women were more likely to purchase foods labeled “organic”. Nasir, et al. (2014) found that in addition to females, younger, educated, and relatively affluent consumers are also more likely to purchase organic foods. Racine, et al., (2012); Stanton, et al., (2012) found that individuals who live in a rural area, and are older and affluent are more likely to buy local foods. Another study added that those who have supportive attitudes toward local food were more likely to purchase food labeled “local” (Feldmann, et al., 2015). The apparent difference between many of the studies was that younger individuals preferred foods labeled “organic” while older individuals preferred foods labeled “local.”

Along with the labels “local” and “organic” there are other labels that influence consumers to buy a product. Studies performed by Pouta et al., (2010) and Van Loo et al., (2014) found that consumers prefer labels related to animal welfare rather than organic labeling. Their studies also stated that consumers will even pay more for those items with animal welfare related labels. These animal welfare labels referred to the way the animal was raised, such as grass fed, free range, and other labels related to enhancing the welfare of their meat products (DeJonge, et al., 2013b). Other studies have shown that there is opportunity for agricultural marketers to consider these labels when marketing many meat products (DeJonge et al., 2013a; Vanhonacker et al., 2014).

Labels concerning Genetically Modified Organism (GMO) are becoming increasingly important to consumers and have started to impact purchasing decisions. Center for Food

Safety (2017) indicates that 64 countries require the labeling of genetically modified products. In those countries, there are different regulations referring to what percentage of the product can contain genetically modified products. For example, in the European Union if a product contains more than 0.9 percent of a genetically modified organism it must be labeled (Dobnik et al., 2015). There are some studies in the United States have found that the majority of consumers are in favor of GMO labeling (Berning, et al., 2017; Hemphill, et al., 2015; Wunderlich, et al., 2015). Hallman, et al., 2013 indicated that even though the majority of Americans have very little knowledge about genetically modified foods, they desire a required GMO label on genetically modified foods. In the United States, genetically modified foods must be heavily tested before being introduced into the market (Acosta, 2014).

Another food label that is important to consumers when purchasing foods is the nutritional content label. Several studies like those of Hwang, et al. (2016) and Newman, et al. (2017) found that in order to eat healthier more consumers are making purchasing decisions based on nutrition labels. Many countries have even passed laws enforcing package nutrition labels. Such labels are supposed to help consumers make informed purchases. Findling, et al. (2017) and Ducrot, et al. (2016) noticed that many companies in the U.S. are using package nutrition labeling as a marketing technique by giving consumers the information they are looking for on the front of the package.

3. Methodology

3.1 Data Collection Process

The data used in this analysis were collected using an online-based survey. Participants are 1,205 online shoppers; defined as those consumers who made at least two purchases in the online market six months before receiving the survey. We limited this study to those online shoppers who were located in the Southern region of the United States (U.S. Census Bureau, 2016). For a better representation, each state in this region is proportionally represented in the sample based on its population. We created survey questions in the Qualtrics software. This software includes features that allows accurate profiling and tracking each respondent. The features are important in ensuring that respondents are actually meet desired characteristics for this study. Furthermore, using this software allowed us to design questions with advanced branching logic and randomizing question options. Because of these integrated features, we were able to avoid possible bias among study participants. In February 2016, we conducted a pilot study to test the capacity of the survey to collect good data. In this pilot study, 100 online shoppers participated in this pilot exercise. The pilot study allowed us to rephrase some questions and prompted a need to include the attention-check questions. We also added a number of questions aimed at eliminating inattentive participants. We set the software in way that any survey taker with incorrect answer to such questions was excluded automatically.

We consulted the Qualtrics company to collect data. This company is a professional survey software provider with extensive experience data collection. The company works in partnership with many market-related entities who provide respondents with specific sample requirements. Qualtrics distributed the survey between March and June 2016 to individuals who meet our criteria (online shoppers proportionately located within the South region). We checked every internet protocol location and used an advanced digital fingerprint technology in order to assure both quality and validity of the data. The survey remained open until we reached 1,205 surveys were completed, verified, and validated.

3.2 Model Specification

This analysis uses a Multinomial Logistic model. Our theoretical modeling strategy follows Kennedy (2009), Train (2009), and Chan (2005). This model makes it possible to estimate relative likelihood for an online shopper to prefer a particular food label among four unordered options. We assume that the respondents behave rationally when making decisions. It means that they have complete and transitive preferences and choose the best option they believe maximize their utility (Mas-Colell et al., 1995). We also assume that adding a new label option to the set has no impact on relative odds among choices already in the set. This what (Train, 2009) referred to be the Independence from Irrelevant Alternatives (IIA) holding true. We finally assume that the chooser's utility from the existing choice set is a linear

function of his/her characteristics, plus an error term. Hence, equation (1) shows the utility (U_{ij}) function form,

$$U_{ij} = V_{ij} + \varepsilon_{ij}, \text{ for } i = 1, \dots, I \text{ and } j = 1, \dots, J \quad (1)$$

The V_{ij} in (1) is a deterministic component of the utility, ε_{ij} is a random component, i stands for respondent, and j stands for the label options. Respondents had four options to choose from. They were asked “when purchasing food products, which label is the most important?” 1 = Locally grown, 2 = Organically grown regardless of origin, 3= Both locally and organically grown, 4 = Other (please specify).

The ε_{ij} term is assumed to be independently and identically distributed in accordance with an extreme value $F(\varepsilon_{ij}) = \exp(-\exp(-\varepsilon_{ij}))$. This allows for the logit model to be appropriate (Kennedy, 2008).

There is a latent variable or indirect utility which drives the chooser’s decision. The indirect utility for respondent i to choose a specific label option j is:

$$= \beta'X_{ij} + \mu_{ij}^*, \text{ for } i = 1, \dots, I \text{ and } j = 1, \dots, J \quad (2)$$

X_{ij} in (2) is a vector of respondent’s characteristics, β is a vector of the parameters we estimate and differs across four options. The μ_{ij} accounts for unobserved factors. Because individual’s utility is unobservable, individual’s choice y_i (observable) indicates an option that maximizes his/her utility. That is: $y_i=1 \Leftrightarrow V_{i1}^* > V_{ij}^* \forall j, y_i=2 \Leftrightarrow V_{i2}^* > V_{ij}^* \forall j, \dots, y_i=J \Leftrightarrow V_{iJ}^* > V_{ij}^* \forall j$

(3)

The probability (P) that a shopper i chooses an option j is shown as:

$$P_{ij} = P(y_i = j) = \frac{\exp(\beta'_k X_{ij})}{\sum_j \beta'_k X_{ij}} \quad (4)$$

We obtain the β ’s by setting $\beta_{j^*} = 0$ for reference option; j^* . In this study, the “Other” option is the reference category. From (4) above, the β ’s (in comparison with the reference outcome j^*) are computed as follows:

$$\frac{\delta \log(P_j | P_{j^*})}{\delta X_k} = \beta_{ik} - \beta_{j^*k} \quad (5)$$

which reduces to,

$$\frac{\delta \log(P_j | P_{j^*})}{\delta X_k} = \beta_{ik} \quad (6)$$

The marginal effect of an independent variable X_k on the choice probability for an alternative j is given by,

$$\frac{\delta P(y = j | X)}{\delta x_k} = P(\beta_{jk} - \bar{\beta}_{jk}) = P(\beta_{jk} - \frac{\sum_j \beta_{jk}}{J}) \quad (7)$$

A positive parameter β_{jk} for a continuous variable indicates that the relative likelihood to choose the corresponding j increases compared to that of choosing j^* . For dummy variables, the β ’s are the probability differences between X_{ij} values of zero and one (Schmidheiny, 2007).

We hypothesize that each independent factor has no significant effect on the likelihood of preferring a specific j as the most important food label relative to the j^* (Null Hypothesis). That is $H_0: \beta_{jk} = 0, \forall k = 1, \dots, K$; $j = 1, \dots, J$ for K explanatory and J label options. We then hypothesize that each independent variable has significant effect on the likelihood of preferring a specific j as the most important food label relative to the j^* (Alternative Hypothesis). That is; $H_1: \beta_{jk} \neq 0, \forall k = 1, \dots, K$; $j = 1, \dots, J$ for K explanatory and J label options.

4. Results

in this study, we asked several questions about consumer characteristics. Table 1 shows descriptive statistics for those characteristics with significant effects on the likelihood of considering food labels and/or on the most important labels when making purchasing decisions. We present the statistics for each of the four label options and then for the entire sample (see last column).

Table 1. Consumer Characteristics by the Most Preferred Food Labels

Markets	Locally Grown	Organically Grown	Both Local and Organic	Other Labels	Total
Age	49	41	46	46	47
Female	0.63	0.58	0.66	0.56	0.62
Married	0.58	0.49	0.57	0.55	0.56
Caucasian	0.90	0.73	0.78	0.78	0.82
GovAssistance	0.12	0.17	0.14	0.22	0.15
InterestedInCSA	0.52	0.67	0.65	0.42	0.55
InterstLearnFPMarket	0.85	0.83	0.89	0.62	0.81
InterestOnlineShopFP					
Not Interested	0.26	0.08	0.12	0.36	0.22
Might Interested	0.52	0.40	0.48	0.43	0.48
Very Interested	0.22	0.52	0.40	0.21	0.30
WTPLocalFP	6.64	8.00	7.34	6.22	6.90
WTPForeignFP	4.69	6.32	5.68	5.40	5.32
Total	462	151	318	274	1205

In the entire sample, we found that an average online shopper is 47 years old. There were 62 percent females, 56 percent married and 82 percent Caucasians. 15 percent are recipients of some form of food assistance such as WIC, Senior nutrition program, and food stamps. We found that 55 percent of the respondents are interested in joining the Community Supported Agriculture (CSA) programs. This includes those who are already subscribers. This suggests that those farmers who participate in the CSA programs have a potential market in the online environment. We reported that the vast majority (81 percent) of online are interested in learning about markets for fresh produce. This suggests that fresh produce growers and/or agricultural marketers/sellers can increase their market share by using educational and marketing strategies targeting online shoppers. As for being interested in shopping fresh produce online, we found that 22 percent are not interested all, 48 percent might (or not) be interested. What is encouraging to online sellers of fresh produce is that 30 percent of respondents indicated that they are definitely interested in shopping fresh produce online. The WTPLocalFP variable averages the amounts of money online shoppers are willing to pay for a pound of green beans, sweet corn, roma tomatoes, strawberries and kale that are locally grown. The WTPForeignFP variable is for the same products imported from abroad. We found that, on average, online shoppers are willing to pay \$6.90 for locally grown and \$5.32 for the imported ones.

Statistics related to each of the four label options are in Table 1 (see 2—5 columns). For example, an average respondent whose most preferred food label is “local” is 49 years old, is willing to pay \$6.64 for locally grown and \$4.69 for the imported one. Females are 63 percent of the “local” fans, married are 58 percent, and Caucasians are 90 percent. We found that 26 percent of these shoppers are not interested in buying fresh produce online while 22 are very interested.

Results show that 81 percent of online shoppers actually believe that food labels are very important to them. The most important label for the majority (49 percent) of those who believe so is “grown locally”. Those whose “organic” label is the most important constitute 15 percent. We found that 30 percent consider a combination of locally and organically grown fresh produce to be the most important to them. Only six percent of online shoppers have other labels

they consider the most important. The most common important labels among this group include nutrition contents, price, and country of origin.

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