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Online Shoppers Spending on Fresh Produce; Do Those on Government Assistance Spend Less?

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ONLINE SHOPPERS SPENDING ON FRESH PRODUCE; DO THOSE ON GOVERNMENT ASSISTANCE SPEND LESS?

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This study applies an Ordinary Least Squares (OLS) model to explain differences in the amount that online shoppers might spend per month on fresh produce, given specific consumer characteristics. It also uses a multinomial logit model to determine the relative probability of online shoppers spending more or less, given specific consumer characteristics. The independent variable of interest in both models is whether or not the respondent is a recipient of a government assistance food program. These analyses used data from a stratified random sample of 1,205 online shoppers residing in the southern region of the United States. “Online shoppers” in the context of this study are those consumers who have made at least two purchases online in the six months prior to participating in this study. Results in the OLS model indicate that those online shoppers who are locavores, have higher levels of interest in fresh produce, earn higher income than the average level of all respondents, and have higher levels of education in conjunction with an urban living lifestyle will spend more money on fresh produce per month. Results in the multinomial logit model indicate that those online shoppers are 12 percent likely to spend between $0 and $36 per month on fresh produce, compared to about 49 percent who will spend between $37-$97. It also showed those online shoppers that are locavores, caucasion, and citizens of the United States are more likely to spend more money on fresh

produce. This study is important when growers and/or agricultural marketers of fresh produce are looking at which demographics to target the selling of their goods. Future researchers will find this study to be useful as well, in explaining specific consumer characteristics that shape purchasing behavior towards food related products.
Key Words: Online shopper, government assistance, consumer characteristics, fresh produce

1. Introduction

1.1 General Information

Online shopping is a rapidly growing trend in today's society. Consumers are finding it increasingly convenient to make purchases without having to leave their homes. To put this into a perspective, Smith and Anderson (2016) indicated that prior to 2016, seventy-nine percent of all shoppers in the United States have made some kind of purchase online and fifteen percent make online purchases weekly. Baker, Fikes, and Markenson (2018) at the Food Marketing Institute reported that thirty-four percent of shoppers do most of their purchasing online. These online shoppers consist mostly of those consumers considered a "Millennial" or "GenX." According to their report, the top reasons consumers favor online shopping include time saving, convenience, non-presence in the store, money saving, and overall larger selection of products.

Lipsman (2018) predicted that just in 2019 alone, the ecommerce sector was expected to see a 15.1% growth with sales of around $605.3 billion dollars. Petro (2019) showed that 71 percent of all shoppers were likely to spend $50 or more while shopping in a physical store compared to 54 percent of the shoppers surveyed who would spend more than $50 while shopping online.

With this change in consumer behavior, research studies targeting these types of consumers are important. There is a paucity of literature about this new and increasingly popular trend. More specifically, effects of online shoppers' characteristics on their monthly spending/buying fresh produce are unknown.

Likewise, it is not clear whether spending habits of online shoppers who receive food-related assistance differ from their counterparts.

1.2 Objectives

The overall purpose of this study is to analyze factors behind consumer monthly spending on fresh produce among online shoppers. Specific objectives were:

(i) To measure the influence that online shoppers' characteristics have on their monthly expenditure on fresh produce.

(ii) To determine the probability that online shoppers will spend more on produce, given a specific set of consumer characteristics.

(iii) To explain the different spending habits between online shoppers who receive food-related assistance and those who do not. Foster and Rojas (2018) indicated that 21.1% of families were part of some form of government assistance program; including the Supplemental Nutrition Assistance Program (SNAP).

1.3 Research Questions and Hypothesis

(i) Do specific consumer characteristics effect online shoppers' monthly expenditure on fresh produce? This study hypothesized that consumer characteristics have no effects on the monthly expenditure for fresh produce, amongst online shoppers. Alternatively, the effects would be either negative or positive. Hence, these null and alternative hypotheses are mathematically presented as:

$$H_0 : \beta_k = 0;\ \forall k = 1, \ldots, K$$

$$H_1 : \beta_k \neq 0;\ \forall k = 1, \ldots, K$$

Where *K* is representative of the number of different explanatory variables.

(ii) What is the probability that online shoppers will spend monthly more on fresh produce, given a set of specific consumer characteristics? This study hypothesized that online shoppers' characteristics have no impact on the relative probability of spending more on fresh produce. Alternatively, each of the characteristics has either negative or positive impact. Hence, these null and alternative hypotheses are mathematically presented as:

$$H_0 : \beta_{kj} = 0;\ \forall k = 1, \ldots, K\ and\ j = 1, \ldots, J.$$

$$H_1 : \beta_{kj} \neq 0;\ \forall k = 1, \ldots, K\ and\ j = 1, \ldots, J.$$

Where *K* is representative of the number of different explanatory variables, and *J* the number of unordered choice options.

(iii) Do online shoppers with food-related government assistance spend less on fresh produce than those who do not receive assistance? This study hypothesized that the probability difference between recipients of food-related assistance and those without assistance to spend less on fresh produce is 0. Alternatively, the difference is significantly different zero. Hence, these null and alternative hypotheses are mathematically presented as:

$$H_0 : \beta_{1j} = 0$$

$$H_1 : \beta_{1j} \neq 0.$$

1.4 Significance of Study

With the rise in the online shopping, it is important for food marketers to understand spending habits among consumers. Knowing whether the online shoppers are spending more or less on fresh produce is significant. Similarly, it is useful to determine specific consumer groups to target. This study could help to determine if more resources need to be pooled into marketing towards specific types of consumers.

This study is particularly significant because it analyzes effects of online shoppers' characteristics on their monthly spending towards fresh produce. The "healthier America" trend continues to grow. In an article published by Men's Health, a study showed that Americans are eating roughly 3% less processed foods with added sugars (Ellis, 2019). Carroll (2016) reported that Americans saw a decline in the number of new diabetes diagnoses; mainly due to an increase in overall more healthful eating. It is important to explain spending habits on healthful food, especially those online shoppers with food-related government assistance.

2. Literature Review

In this section, this study discusses a few previous pieces of literature that attempted to address the issue of online shoppers and their different purchasing behaviors, some towards fresh produce. Munson, Thanassis, and Lowe (2017) investigated consumer behaviors towards the online grocery market, in the UK. They found that despite popular belief, the proportion of fresh products bought online exceeded that of those bought conventionally.

Gumirakiza, Kingery, and King (2018) found that the probability of online shoppers' interest levels in markets for locally/regionally grown produce is 66 percent. Their study indicated that 48 percent were more likely to prefer obtaining information about fresh produce via Internet-based sources. While Gumirakiza, VanZee, and King (2017) posited that most preferred market venue to obtain fresh produce among online shoppers is grocery stores. They found a relative probability equal to 44 percent, and a relative probability for online shopping to be the most preferred was estimated at 5 percent.

Salisbury et. el. (2018) found in a pricing study that farmers' markets on average, are more expensive in terms of local produce. Location and produce type are also large factors in price determination. Mcguirt et. al. (2018) observed the ability of CSA programs and their ability to provide healthy food options to limited resource and lower population rural areas. They found that the ideal CSA program would have 8-10 items, be distributed bi-weekly, cost no more than $15, and be no more than 10 minutes farther from a supermarket. These lower income families also wish that CSA programs are less expensive than local supermarkets but are no more than 20% more expensive. These two studies provide a better insight on the kinds of dollars consumers spend and some potential barriers to access these kinds of programs. They also looked at consumers' willingness to pay on healthy, freshly grown food products, which is ultimately connected to Americans being able to eat more healthful.

Concerning effects of being a part of a government assistance program has on consumer behavior towards grocery goods, Leone et. al. (2012) found

that the most cited barrier for those consumers (in the state of North Carolina) to fresh produce and shopping at farmers markets was cost. They also found that some consumers on government assistance do not shop from local fresh produce vendors who do not accept food programs' means of payment.

Pitts et. al. (2015) noted that one of the main barriers to shopping at farmers markets among lower income families was that these places did not accept Supplemental Nutrition Assistance Program (SNAP). Krowkowski (2014) recommended continual use of the EBT cards at farmers markets. Cassady, Jetter, and Culp (2007) found that lower-income families typically devote 43-70% of their food budget to fruits and vegetables. Lindsay et. al. (2013) found that utilizing monetary incentives to government nutrition assistance recipients increased daily consumption and weekly spending on fresh produce, as well as increased vendor revenue at local farmers' markets in San Diego, CA. This study will help pave the way for expanding the fresh produce market to consumers who utilize government assistance.

3. Methodology

3.1 Data Collection

The data utilized in this study came from a stratified random sample of 1,205 online shoppers using an online-based survey. In the context of this study, online shoppers were defined as consumers who made at least two online purchases within six months prior to taking the survey. Geographically, the study targeted online shoppers residing in the Southern region of the United States.

This “region” consisted of Arkansas, Delaware, Florida, Georgia, Tennessee, Texas, Virginia, West Virginia, and the District of Columbia.

The survey was designed in the Qualtrics Survey software. It provided features that made it possible to compose survey questions using advanced branching logic, randomization, question timing, and question block presentation. This prevented any possible bias that could stem from the survey. Other bias-preventive questions intended to require that respondents actually contemplate their answers to ensure that they were in fact paying attention and answering correctly. Examples of those questions would be a simple math-related operation scenario with answer alternatives where a respondent must indicate the right answer. Respondents who gave incorrect answers were automatically excluded from the study. The survey can be found in the Appendices. The software also offers the ability to track, profile, and monitor the responses of each individual respondent.

The survey questions that were relevant to this study included the average amount that an online shopper spends per month on fresh produce. Responses on this question were used for the explained/dependent variable. Other questions were various consumer characteristics as described in Table 1 served as the other independent variables. These included a binary question on whether or not an online shopper is on a form of food-related government assistance, which is important for the third objective of this study.

3.2 Model Specification

3.2.1 Ordinary Least Squares (OLS) Model

For the OLS model, it is assumed that it will follow all of the assumptions associated with ordinary least squares (Albert 2016). The first assumption states that the model is linear in its coefficients and the error term. The second assumption states that there is random sampling of observations. The third, that the conditional mean is zero. The fourth, that there is no perfect collinearity. The fifth, that there is no heteroscedasticity. The sixth, that the error terms are normally distributed. Equation (1) below represents the first assumption:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots + \beta_k X_k + \varepsilon \quad (1).$$

The β's are the parameters that the OLS regression will estimate, and the ε is the random error term. This regression chosen principally due to the continuous nature of the dependent variable.

3.2.2 Multinomial Logit Model

For the multinomial logit model, this study assumed that the respondents are rational and have complete and transitive preferences (Mas-Colell, Whinston, & Green 1995). Within this framework, it modeled different categories of monthly spending on fresh produce among online shoppers. Each individual shopper *i* in a specific category of spending *j* receives a utility/satisfaction. As in Keeling-Bond, Thilmanny-McFadden, & Bond (2009), it assumes a linear function of the shopper choices and specific characteristics plus an error term. The utility function for each online shopper *i* in a specific category *j* is given by equation (2) below:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \ (i = 1, \ldots I \text{ and } j = 1, \ldots J) \quad (2).$$

The V_{ij} determines the utility for the i^{th} individual and j^{th} category. The ε_{ij} serves as the random error term and it assumed it to be independently and identically distributed, which makes this logistic model appropriate (Kennedy, 2008). In addition, this study assumed that V_{ij} follows a linear-in-parameter utility functional form (Onozaka & Thilmany-McFadden, 2011). As a result, V_{ij} is illustrated by Equation (3) below:

$$V_{ij} * = \beta' X_{ij} + \mu_{ij} \ (i = 1, \ldots I \text{ and } j = 1, \ldots J) \quad (3).$$

In Equation (3) above, X_{ij} is a vector of the online shopper characteristics. The parameters of β will be estimated for each j category relative to the base. The μ_{ij} accounts for all of the unobservable factors in the model.

Researchers do not actually observe the utility of the chooser. One instead observes the spending category that he/she falls under. This implies that the observed category y_i for an individual shopper i is:

$$[y_i = 1 \Leftrightarrow V^*_{1j} > V^*_{ij} \ \forall j, \ y_i = 2 \Leftrightarrow V^*_{i2} > V^*_{ij} \ \forall j, \ \ldots, \ y_i = J \Leftrightarrow V^*_{iJ} > V^*_{ij} \ \forall j] \quad (4).$$

The probability (P) that an individual i falls in the spending category j is expressed below:

$$P_{ij} = P(y_i = j) = \exp(\beta_k X_{ij}) / \Sigma \beta_k X_{ij} \quad (5).$$

The β*'s* are created by setting $\beta_{j^*} = 0$ for one reference/base category, j^*. The "Less than $36 Spenders" category served as the reference category, or base outcome, in this study. From Equation (5), the parameter estimates are derived in the following manner:

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

which simplifies to,

$$\frac{\delta log(P_j|P_{j*})}{\delta X_k} = \beta_{ik} \quad (7).$$

Equation (6) leads to Equation (7) because $\beta_{j*} = 0$ for the reference/base category *j*.* According to Schmidheiny (2007), a positive parameter β_{ik} for a continuous variable means that the probability of being in a specific *j* category increases relative to the probability of being in the reference category *j*.* The dummy variable effects are measured and interpreted as the difference of probability between X_{ij} values of 0 and 1.

In the first model (OLS) the "average monthly amount spent on fresh produce" was used as the dependent variable, and the specific consumer characteristics served as the explanatory variables. In the second model (Multinomial logit), four categories were made (using a cluster analysis) and used as the dependent variables. These clusters were as follows: those who spend less than $36 per month on fresh produce (base outcome), those who spend between $37-$97 per month, those who spend between $98 and $249 per month, and those who spend over $250 per month on fresh produce. Whether or not an online shopper receives food-related government assistance was the explanatory variable of interest.

3.3 Data Analysis

Seen below are the explanatory variables chosen for the model, as well as short descriptions of their meaning. There was a total of fourteen variables selected to serve as the consumer characteristics in this study.

Table 1. Variables of Interest and their Mean Values

Variable	Description	Mean
MonthlySpendFreshProduce[1]	Monthly expenditure on fresh produce (in dollars).	57.8311
Less_than_36_Spenders[2]	A cluster representing those consumers that spend $36 or less per month on fresh produce.	16.3407
Between_37_and_97_Spenders[2]	A cluster representing those consumers that spend between $37 and $97 per month on fresh produce.	57.1813
Between_98_and_249_Spenders[2]	A cluster representing those consumers that spend between $98 and $249 per month on fresh produce.	135.9418
More_than_250_Spenders[2]	A cluster representing those consumers that spend $250 or more per month on fresh produce.	346.2857
GovAssistance	1 if the respondent participates in food stamps, WIC, or Senior Nutrition Program, 0 otherwise.	.1527
Age	Age of the respondent.	47.
Urban	1 if the respondent lives within an urban area, 0 otherwise.	.7560
Female	1 if the respondent is a female, 0 otherwise.	.6166
Married	1 if married, 0 otherwise.	.5602
Locavore	1 if the respondent eats primarily local food products, 0 otherwise.	.7245
CollegeGrad	1 if the respondent has at least a 2-year college degree, 0 otherwise.	.4929
Caucasian	1 if Caucasian, 0 otherwise.	.8199
Income	Those respondents that made more than the average yearly income	.3676
InterestLevelLocalFP	1-5 scale of level of interests in fresh produce: 1=Not Interested, 2=Somewhat Interested, 3=Interested, 4=Very Interested, 5=Extremely Interested.	3.8730
Married_Urban	1 if married and lives within an urban area, 0 otherwise.	.4199
Educated_Urban	Interaction term between Urban and education (1=high school, 2 4-year college, 3= graduate degree).	1.4672
Citizen	1 if citizen of the US, 0 otherwise.	.9427

Note. [1] and [2] represent the dependent variables for Model 1 and Model 2 respectively.

The average respondent spent about $57.83 per month on fresh produce. In terms of the clusters, those respondents in cluster 1 spent about $16 per month on fresh produce, those in cluster 2 spent about $57 per month on fresh produce, those in cluster 3 spent about 136 spent about $136 per month on fresh produce, and those in cluster 4 spent about $346 per month on fresh produce. About 15% of the online shoppers were members of some form of government assisted food program (explanatory variable of interest).

The average age of the respondents was about 47 years old. About 76% of the respondents lived in urban areas and roughly 62% were female and 56% of the respondents were married. 72% of the respondents considered themselves locavores, eating mainly food products produced locally. Of the respondents, about 49% have at least a two-year college degree, while about 81% were of caucasion race. Among respondents, 37% made more than the average yearly income; which was roughly $75,600.

The interest level in locally grown fresh produce was 3.8. This suggests that on average, respondents were between “Interested” and “Very Interested.” About 42% of the respondents were married, in conjunction with living in an urban area, and 94% were citizens of the United States.

4. Results

4.1 Ordinary Least Squares Model

The OLS regression utilized “MonthlySpendFreshProduce” as the dependent variable. Seen below in Table 2 are the coefficient estimates. These results are measured in “dollars per month.” A positive value denotes more

dollars were spent per month, while negative values denote less dollars spent per month.

Table 2. Coefficient Estimates from the Ordinary Least Squares Model

Variable	MonthlySpendFreshProduce
GovAssistance	5.646
Age	-.454***
Urban	-6.476
Female	-14.327***
Married	7.928
Locavore	13.672***
CollegeGrad	4.333
Caucasian	-12.519***
Income	20.384***
InterestLevelLocalFP	14.911***
Married_Urban	-8.774
Educated_Urban	9.325**
Citizen	-7.948
Stats:	
Number of Observations=	1205
F (14, 1190) =	15.84
Prob > F=	0.0000
R-Squared=	0.1571
Adj R-squared=	0.1471
Root MSE=	63.204

Note. The *,**,*** denote significance at the 10%, 5%, and 1% level, respectively.

The results indicate that government assistance (explanatory variable of choice) has no statistically significant influence on the spending of fresh produce. Those statistically significant variables included age, female, locavore, income, and interest level in fresh produce all at the 10% level, while “Caucasion” and “Educated_Urban” were at the 5% level. Positive values denote an increase in spending, while negative values denote a decrease in spending. For each year of age that an online shopper gains, they will spend roughly $0.45 less on fresh produce per month. Those female online shoppers will spend about $14.33 less

per month, while those online shoppers who are of the Caucasion ethnicity will spend $12.52 less per month.

Online shoppers who eat primarily locally grown foods are likely to spend $13.67 more per month on fresh produce, while those individuals who earn more than the average income of all the respondents will spend about $20.38 more per month. In addition, those online shoppers with higher levels of interest in locally grown items will spend $14.91 more per month on these types of products. Furthermore, those online shoppers who have higher levels of education and live in urban areas will spend about $9.33 more on their monthly expenditure for fresh produce.

4.2 Multinomial Logit Model

The cluster analysis developed four groups of spenders, based on the varying amounts spent. They are seen below, along with the descriptive statistics. The “Less than $36 spenders” group was used as the base outcome and the other clusters were compared to that.

Table 3. Descriptive Statistics about Spending Clusters

Cluster	**Mean**	**Standard Deviation**
1 (less than $36 spenders)	16.3407	11.0378
2 (between $37 and $97 spenders)	57.1813	12.5106
3 (between $98 and $249 spenders)	135.9418	38.0760
4 (greater than $249)	346.2857	91.7224

The multinomial logit model utilized the clusters above as the dependent variable, and the consumer characteristics (listed in Table 1) as the explanatory

variables. The “Less than $36” cluster was used as the base outcome group, and therefore no coefficient estimates are present in Table 4.

Table 4. Coefficient Estimates from the Multinomial Logit Regression Models

Variable	**Between $37-$97**	**Between $98-$249**	**More than $250**
GovAssistance	.0923	-.0900	.5450
Age	.0225***	.0089	-.0201
Urban	.3326	.1445	13.4068
Female	.6511***	.4510**	-.4708
Married	-.0889	.3238	13.6407
Locavore	-.6642***	-.4600**	.2738
CollegeGrad	-.1263	.0537	.4679
Caucasian	.5465**	.2739	-.1123
Income	-.8444***	-.6792***	.7220
InterestLevelLocalFP	-.7889***	-.3806***	.3287
Married_Urban	.1362	-.1292	-13.9400
Educated_Urban	-.3559**	-.2086	.1321
Citizen	1.0189***	.7500**	.6163
Stats:			
Prob > chi2 =	0.000	0.000	0.000
Pseudo R2 =	0.0954	0.0954	0.0954
Log L=likelihood =	-1205.4557	-1205.4557	-1205.4557
Observations =	1205	1205	1205

Note. The *,**,*** denote significance at the 10%, 5%, & 1% level, respectively.

A positive coefficient estimate shows that an increase in the variable is associated with a positive increase in the relative probability that an online shopper will fall into that spending cluster, in comparison to the base group. Negative coefficient estimates are associated with a decrease in the relative probability that online shoppers will fall into that specific spending cluster, in comparison to the base group. More specifically looking at the explanatory variable of interest “GovAssistance,” it has no statistically significant influence on

the relative probability that an online shopper will spend more or less on fresh produce in a given month.

An analysis of cluster 2 (between $37-$97) shows that as those online shoppers get older, they are more likely to spend between $37-$97 per month on fresh produce, in comparison to the base group. Observing the other variables that were statistically significant, we see that those online shoppers who were female, of caucasion ethnicity, and were a citizen of the United States, are shown to be much more likely to spend within cluster 2, than in the base outcome. Inversely, those online shoppers who considered themselves locavores, had higher levels of monthly disposable income, and had higher levels of interest in fresh produce were less likely to spend within this cluster, compared to cluster 1. Those online shoppers who possess at least a two-year college degree and live in an urban area, are also less likely to spend in cluster 2, in comparison to the base group.

An analysis of cluster 3 (between $98-$249) shows that those online shoppers that are female and citizens of the United States are more likely to spend between $98-$249 on their monthly expenditure for fresh produce than in comparison to cluster 1 (base outcome). Surprisingly, those online shoppers who eat primarily locally grown foods, have higher levels of monthly income, and have levels of interest in fresh produce are less likely to spend within this cluster, than when compared to the base outcome. This is an interesting result, as it would be expected consumers with those kinds of attributes are to be more likely to spend

higher amounts of dollars on fresh produce. . .

An analysis of cluster 4 (greater than $250) shows that there are no statistically significant variables to discuss.

Table 5. Marginal Effects of the Multinomial Logit Regression Model

Cluster	Less than $36	Between $37-$97	Between $98-$249	More than $250
dy/dx	=12.12%	= 48.76%	= 38.86%	= .3411%
GovAssistance	-.0018	.0388	-.0392	.0022
Age	-.0017	.0040	-.0021	-.0001
Urban	-.0367	.0161	-.0581	.0787
Female	-.0624	.0792	-.0130	-.0038
Married	-.0764	-.3406	-.1531	.5701
Locavore	.0555*	-.0772	.0193	.0023
CollegeGrad	.0047	-.0425	.0356	.0018
Caucasian	-.0491	.0854*	-.0344	-.0019
Income	.0881	-.0868	-.0073	.0061
InterestLevelLocalFP	.0643*	-.1256**	.0584	.0029
Married_Urban	.0646	.3114	.1693	-.5453
Educated_Urban	.0308	-.0497	.0176	.0013
Citizen	-.1261**	.1213*	.0051	-.0004

Note. The *,**,*** denote significance at the 10%, 5%, and 1% level, respectively.

The relative probability that an online shopper will spend less than $36 per month on fresh produce is 12.12%. The explanatory variable of choice “GovAssistance,” showed no statistically significant influence on the relative probability on monthly expenditure for fresh produce. . Those online shoppers that are primary locally grown food eaters are 5.5% more likely to spend in this cluster, than when compared to the others. Those that have higher levels of interest in locally grown food products are 6.4% more likely to spend in this cluster as well. However, those online shoppers who possess citizenship status are actually 12.6% less likely to spend in cluster 1, when compared to the other groups.

The relative probability that an online shopper will spend between $37-$97 per month on fresh produce is 48.76%. “GovAssistance,” showed no statistically significant results to discuss. The relative probability that an online shopper who is caucasion to spend in cluster 2 is 8.5%. Those online shoppers that are citizens have a relative probability of 12.1%. Inversely, those that are more interested in locally grown, fresh produce are 12.6% less likely to spend within cluster 2, when compared to the other groups. Clusters 3 and 4 both yielded no statistically significant results for discussion.

5. Conclusion

5.1 Discussion of Results/Suggestions

According to the OLS regression model, online shoppers who are on government assisted food program had no difference in spending on fresh produce, compared to those who are not on a similar program. The results that were yielded from the model were not statistically significant. Marketers of fresh produce items should however continually focus their efforts on those “locavore lifestyle” kinds of consumers. They should also look at ways to attract those online shoppers that have high levels of interests in fresh produce products, however, do not currently actually purchase them. Learning ways to convert “interest levels” into “dollars spent” will likely see increased profits for their goods. They should also focus their efforts towards those consumers with higher levels of income and have higher levels of education in conjunction with urban living, as they are shown to spend more money on fresh produce.

According to the multinomial logit regression model, online shoppers who are locavores and have higher interest levels in fresh produce are more likely to be in the lower spending cluster ($36 or less per month) or less likely to be in the moderate spending clusters (2 and 3). Further research could look investigate whether these locavores and local, fresh produce interest consumers are idealistic lower income young people that do not have the same purchasing power, or if they simply choose not to spend at higher levels. Other research could include observing whether or not locavores actually spend more on locally grown food items, compared to other consumers. The MLS model also found that females, Caucasians, and U.S. citizens are more likely to be in the moderate spending clusters and had higher probabilities of being in the low spending cluster. Further research can look at whether or not marketers should target this group or find ways to get them to spend more money on fresh produce.

5.2 Limiting Assumptions

This study may help marketers of fresh produce better target consumers. This study did however only focus on “online shoppers.” Since the data was gathered in 2016, the term “online shopper” has likely evolved. Gathering more recent data may lead to a much higher sample size, as online shopping has grown significantly over the last five years. Other projects could simply remove the “online shopper” label, and focus strictly on all levels of consumers, while still focusing on whether or not they are a part of government assistance food programs.

This study is also limited geographically. It focused on the southern region of the United States. Further studies can look at the country as a whole, or more specifically other regions of the U.S. Spending habits vary from place to place, so these studies could possibly yield interesting data.

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APPENDIX A

CONSUMER SURVEY

Western Kentucky University is conducting a study to evaluate consumer preferences for locally grown fresh produce among online shoppers. We are asking for your participation in this study by taking this survey. The survey will take approximately 10 minutes to complete. There are no anticipated risks to your participation. We guarantee that your information will be anonymous and confidential. Your continued cooperation with the following survey implies your consent. THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY THE WESTERN KENTUCKY UNIVERSITY INSTITUTIONAL REVIEW BOARD. Should you have any concerns about your rights or a research-related concern as a research participant, you are welcome to contact the compliance manager of the Office of Research Integrity at Western Kentucky University at (270) 745-2129 or by email at paul.mooney@wku.edu. Thank you so much for accepting our invitation to participate in this study.

1. Are you at least 18 years old?
- ❍ Yes
- ❍ No

If No Is Selected, Then Skip To End of Block

2. Which State do you live in?
- ❍ Alabama
- ❍ Arkansas
- ❍ Delaware
- ❍ District of Columbia
- ❍ Florida
- ❍ Georgia
- ❍ Kentucky
- ❍ Louisiana
- ❍ Maryland
- ❍ Mississippi
- ❍ North Carolina
- ❍ Oklahoma
- ❍ South Carolina
- ❍ Tennessee
- ❍ Texas
- ❍ Virginia
- ❍ West Virginia
- ❍ Other

If Other Is Selected, Then Skip To End of Block

3. In the last six months, how many times did you shop online?
❍ Never
❍ 1-2 times
❍ 3-4 times
❍ More than 5 times
If Never Is Selected, Then Skip To End of Block

4. What is your primary or most frequent market you use to purchase locally or regionally (grown within your State or within a 400 mile-radius from your address) fresh produce (fruits and vegetables)?
❍ Farmers' Markets
❍ CSA (Community Supported Agriculture)
❍ On-Farm (road stands, you pick your own, agritourism)
❍ Online Shopping
❍ Grocery Stores (Please check this ONLY IF YOU READ LABELS to make sure the produce is grown locally and is fresh)
❍ None (do not buy local fresh food products)

5. On average, how much $ do you spend MONTHLY on locally grown fruits and vegetables during:
❑ Summer season _____
❑ Fall season _____
❑ Winter season _____
❑ Spring season _____

6. When was the last time you attended a farmers' market?
❍ This year (2016)
❍ Last year (2015)
❍ 2014 or Prior
❍ Never attended

7. If never attended, rank your reasons for not attending. (1 being the most and 5 being the least)
_____ I am not aware of their existence in my area
_____ I am aware, but their hours of operation are inconvenient for me
_____ Inconvenient place (limited parking, long distance, do not like location)
_____ Not a One-Stop shopping destination
_____ Other reasons (Please be specific):

8. On average, how often do you attend a farmers' market per year?
❍ Occasionally (1-3 visits)
❍ Frequently (4-7 visits)
❍ Very Frequent (More than 8 visits)

9. Based on your experience at the farmers' market you last attended, what is your level of satisfaction with the following?

	Extremely dissatisfied(1)	Slightly dissatisfied(2)	Satisfied (3)	Very satisfied (4)	Extremely satisfied (5)
Means of Payments	❍	❍	❍	❍	❍
Parking Space	❍	❍	❍	❍	❍
Quality of Food Products	❍	❍	❍	❍	❍
Price level	❍	❍	❍	❍	❍
Quality of entertainment services	❍	❍	❍	❍	❍
Location of the market	❍	❍	❍	❍	❍
Hours of operations	❍	❍	❍	❍	❍
Overall Experience	❍	❍	❍	❍	❍

10. On average, how much $ do you (or would you like to) spend per visit at the farmers' market?

11. Are you interested in attending direct-to-consumer market outlets (like farmers' markets, Roadside stands, CSA,...) for locally/regionally grown fresh produce?
❍ Yes
❍ No

12. On a scale of 1-5; 1 being most preferred and 5 being the least preferred, please rank the following reasons for you to attend (or would attend) direct-to-consumer market outlets for locally/regionally grown fresh produce.
_____ Support local farmers
_____ Availability of fresh fruits/vegetables
_____ Social interactions with my friends and/relatives
_____ Entertainment (being outside, attend events like music/concerts)
_____ Purchasing items available at those markets other than fresh produce.

13. Are you interested in shopping online for locally/regionally grown fresh fruits and vegetables?
❍ Definitely yes

❍ Probably yes
❍ Might or might not
❍ Probably not
❍ Definitely not

14. Online shopping for locally grown food is available in some parts of the country. You go to the website, look at the agricultural products and their prices, choose the quantity that you want, choose a delivery time, and checkout (pay). While you are online, you can learn about the people who grow your food, how they grow it, and some cooking recipe. If this online market is available in your location, on average, how often per month do/will you shop there?
❍ Between 76% and 100% of the times (almost always)
❍ Between 51% and 75% of the times (Very frequently)
❍ Between 26% and 50% of the times (Less frequently)
❍ Between 10% and 25% of the times (Occasionally)
❍ Less than 10% of the time (Rarely or never).

15. If you order your fresh produce online, how fast would like your order to be delivered?
❍ Within 6 hours
❍ Within 12 hours
❍ Within 18 hours
❍ Within 24 hours
❍ Other (Please specify) _____

If Other (Please specify) Is Not Equal to survey, Then Skip To End of Block

16. If a year-long everyday (open 7/12) farmers' market/store is available within 20 miles of your address, on average, how often per month do/will you shop there?
❍ Between 76% and 100% of the times (Almost always)
❍ Between 51% and 75% of the times (Very frequently)
❍ Between 26% and 50% of the times (Less frequently)
❍ Between 10% and 25% of the times (Occasionally)
❍ Less than 10% of the time (Rarely or never)

17. Are you a CSA (Community Supported Agriculture) subscriber?
❍ Yes
❍ No

If Yes Is Selected, Then Skip To 20.

18. Do you know what a Community Supported Agriculture (CSA) program is?
❍ Yes
❍ No

19. Community Supported Agriculture (CSA) is a membership or a subscription program in which a local farmer offers to consumers a certain number of "shares" consisting of a weekly box/basket of fresh produce. CSA consists of a community

of individuals who pledge support to a farm operation so that the farmland becomes, either legally or spiritually, the communities farm, with the growers and consumers providing mutual support and sharing in the risks and benefits of food production. Typically, the payment is made early in the season, but some farmers accept weekly or monthly payments. Would you consider subscribing to a local CSA program?

❍ Yes
❍ No

20. Do you think that leaders in your community influence your decisions to purchase and consume locally grown fresh produce?

❍ Yes
❍ No

21. What is your level of agreement with each of the following statements?

	Disagree (1)	Unsure (2)	Agree (3)
I think local grown fruits and vegetables are well marketed in my area	❍	❍	❍
I think local organic fruits and vegetables are well marketed in my area	❍	❍	❍
I am aware of market outlets for local fresh produce in my community	❍	❍	❍

22. Please indicate your levels of interest in the following:

	Not Interested(1)	Somewhat Interested (2)	Interested (3)	Very Interested(4)	Extremely Interested(5)
Locally grown food products	❍	❍	❍	❍	❍
Domestically grown produce	❍	❍	❍	❍	❍
Imported from poor countries to support their economies	❍	❍	❍	❍	❍

Imported food products	❍	❍	❍	❍	❍
Product freshness	❍	❍	❍	❍	❍
Organic products	❍	❍	❍	❍	❍

23. Based on how you get information about shopping and events in your community, rank the following advertising ways you would like to be informed about farmers markets and any other market for local and/or organic food products. 1 being most preferred and 5 being the least preferred.

_____ Internet Advertisement (websites, Facebook, Twitter...)
_____ Local Radio stations and/or TV Advertisement
_____ Word of mouth (from relatives/friends)
_____ Newspapers
_____ Information displayed on public places (roadside signs, buses, etc.)

24. Are you interested in learning more about markets for fresh locally grown food products in your area?

❍ Yes
❍ No

25. Imagine shopping for Grapes where the following are three types, their attributes and prices. Which option will you purchase?

❍ Option A: Green Seedless Grapes, $2.09 per pound
❍ Option B: Black Seedless Grapes, $2.18 per pound
❍ Option C: Red Seedless Grapes, $2.00 per pound
❍ None of the above

26. Imagine shopping for Grapes where the following are two types and their attributes and prices. Which option will you purchase?

❍ Option A: Green Seedless ORGANIC, NON-LOCAL grapes, $2.50 per pound
❍ Option B: Green Seedless NON-ORGANIC, LOCALLY GROWN Grapes, $2.09 per pound
❍ None of the above

27. How much money would you be willing to pay (WTP) and can afford for one pound of the following products if they are LOCALLY GROWN? Please be realistic so that the amount of money you indicate reflects the value you

attach to a pound of that specific product. Pretend that you are actually buying that product.

_____ Green Beans
_____ Sweet corn
_____ Tomatoes
_____ Strawberries
_____ Kale

28. How much money would you be willing and able (can afford) to pay for one pound of the following products if they are GROWN IN THE USA, BUT NOT LOCAL? Please be realistic making sure the amount of money you indicate reflects the value you attach to a pound of that specific product. Pretend that you are asked to value that product.

_____ Green Beans
_____ Sweet corn
_____ Roma tomatoes
_____ Strawberries
_____ Kale

29. How much money would you be willing and able (can afford) to pay for one pound of the following products if they are GROWN ABROAD? Please be realistic making sure the amount of money you indicate reflects the value you attach to a pound of that specific product. Please, pretend that you are actually that product.

_____ Green Beans
_____ Sweet corn
_____ Tomatoes
_____ Strawberries
_____ Kale

30. When shopping for food products, do you consider labels, other than prices/costs?

❍ Yes
❍ No

31. When purchasing food products, which label is most important?

❍ "Local" product (regardless of how it is grown)
❍ "Organic" product (regardless of where it is grown)
❍ "Local" and "Organic" product
❍ Other (Please specify) _____

32. Do you primarily eat seasonally-available fresh produce grown or minimally processed within 100 or 250 miles?

❍ Yes
❍ No

33. The location you live in is considered as:
❍ Rural
❍ Small-midsized city
❍ Larger-urban-metro area

34. Do you participate in the following programs? Check all that apply
❑ WIC
❑ Food Stamps
❑ Senior Nutrition Program
❑ None of the above

35. Do you believe eating more fruits and vegetables regularly will help you address dietary concerns?
❍ Yes
❍ No

36. Do you consider yourself as a locavore (a person whose diet consists only or principally of locally grown or produced food)?
❍ Definitely yes
❍ Somehow yes
❍ Unsure
❍ Somehow not
❍ Definitely not

37. How many people are in your household?
❑ Under 18 years old _____
❑ 18 years and older _____

38. What is your citizenship status?
❍ Citizen
❍ Permanent resident (with a green card)
❍ Visa Status

39. What is your gender?
❍ Male
❍ Female

40. How old are you?_____

41. What is your marital status?
❍ Married
❍ Single
❍ Other (Please specify) _____

42. Which of the following best represents your completed level of education?
❍ No high school

- ❍ High school
- ❍ 2-year associate's degree
- ❍ 4-year college degree
- ❍ Graduate degree or higher

43. What is your ethnic background?

- ❍ African-American
- ❍ Asian
- ❍ Hawaiian/Pacific Islander
- ❍ Caucasian
- ❍ Middle Eastern
- ❍ Native American
- ❍ Hispanic

44. What was your 2015 annual household income before taxes? $_____