

Do Online Shoppers Attend Farmers' Markets?

Jean D. Gumirakiza¹ & Mara E. Schroering¹

¹ Department of Agriculture & Food Science, Western Kentucky University, Bowling Green, KY, USA

Correspondence: Jean D. Gumirakiza, Department of Agriculture, Western Kentucky University, EST 237, 1906 College Heights Blvd # 410066, Bowling Green, KY 42101, USA. Tel: 1-270-363-7134. E-mail: dominique.gumirakiza@wku.edu

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Abstract

Online shopping is changing ways in which offline markets operate. As the online shopping for fresh produce takes off, it is important to investigate its effects on existing physical market outlets. The main objective for this study is to explain how often online shoppers attend farmers' markets. The study uses data that was collected in 2016 from a sample of 1,205 consumers residing in the south region of the United States who made at least two online purchases within six months prior to participating in this study. This study employed a multinomial Logit model and Stata was used to run the regression. Results show that the majority of these online shoppers never attended a farmers' market. The relative probabilities for the online shoppers to "never" attend farmers' markets, attend "occasionally", and "frequently" are 0.54, 0.28, and 0.18 respectively. We found that the lack of awareness, inconvenient place and/or time, and low interests are major reasons for nonattendance. This study suggests that farmers' markets could greatly benefit by developing marketing strategies targeting online shoppers.

Keywords: farmers' markets, online shoppers

1. Introduction

Farmers' markets have increased dramatically and so has the online market. U.S. Department of Agriculture (2016) defines farmers' markets as a fixed location where two or more farmer-producers sell their own agricultural products like fruits and vegetables, meat, fish, poultry, dairy products, and grains directly to the general public. At macro-level, Gumirakiza (2016) used a first difference pooled Poisson regression model to explain annual counts for farmers' markets. The study indicated that population growth, agriculture output, and funding for Women, Infants, and Children and the farmers' market nutrition programs have contributed to the increase. At micro-level, there are several studies that attributed the increase in the number of farmers' markets. Such factors include the availability of fresh produce, social interactions, and support local farmers (Baker, Hamshaw, & Kolodinsky, 2009; Onianwa, Mojica, & Wheelock, 2006; Conner et al., 2010; Gumirakiza, Curtis, & Bosworth, 2014; Colasanti, Conner, & Smalley, 2010).

The rise of online shopping is shaping ways in which business is conducted. Wang and Qu (2017) indicated that the rapid development of the Internet, mobile phones, tablet computers, and the electronic devices has changed the way people shop. Online shopping is increasingly becoming popular among buyers of almost all products, including fresh produce. Shanthi and Kannaiah (2015) found that mostly young people are doing most of the online shopping, specifically the ages between 20-25, and the older people do not use it as much. Gupta and Ravikumar (2017) recently found that 81% of online shoppers are students. Gumirakiza and VanZee (2017) found that five percent of online shoppers considered the online market to be their primary venue to purchase fresh produce. The online shopping is definitely having some adverse consequences for the offline market arrangements. It is also causing many physical stores to shut down (Wang & Qu, 2017). For example, Staples, JCPenney, and Sears stores have all decided to close some of their brick and mortar stores in many areas. Given this trend, one might wonder what will happen to farmers' markets and other direct-to-consumer market outlets.

The overall purpose of this article is to explain the frequency of attending farmers' markets among online shoppers. This study is significant because the results found could help fresh produce growers and farmers'

market managers. Findings include shoppers' characteristics that significantly explain specific levels of market attendance. This information is beneficial because it allows growers and/or market managers to adopt targeted marketing strategies. As the online marketplace continues integrating ways to avail fresh produce items, marketers within offline market outlets like farmers will find this study useful.

2. Literature Review

Many research studies about farmers' markets were previously conducted mainly targeting market attendees (Arrington et al., 2010; Gumirakiza et al., 2014; Pascucci et al., 2011; Wolf, Spittler, & Ahern, 2005). Research studies targeting consumers within the online marketplace are limited. Polignac, et al. (2015) posited that online grocery shopping is still in its early days. They suggested that produce marketers will greatly benefit when the market truly takes off. As Kanupriya (2016) indicated, the e-commerce is creating a whole new economy and changing business marketing strategies. Zapata et al. (2016) found that there are farmers' markets that experienced increased number of customers and sales by participating in the electronic market maker system. Farmers' markets ought to be thinking about embracing this market opportunity.

However, Balcarová et al. (2016) cautioned that online farmers' markets may not go well. Their main reason is that several consumers prefer having personal contact with the produce and/or the vendor. Similarly, Nielsen (2015) stated that many consumers go to the store for the sensory experiences that they cannot get online, along with having human interaction when shopping at the store. It was found that 57% of consumers think that grocery shopping is a fun family activity along with 61% say it is an enjoyable and engaging experience. AT Kearney (2015) reported that customers still avoid online grocery shopper because they think prices will be higher. Briggeman and Whitacre, (2008) reported that consumers are reluctant to buy fresh produce online mainly due to quality and service concerns.

Nagra and Gopal (2013), Morganosky and Cude (2001), Wolf et al. (2005) reported that females are more likely to shop online because they seem to be more of an impulsive buyer. Gumirakiza and Vanzee (2018) found that both young individuals and consumers with high interests in locally grown fresh produce are more likely to purchase fresh produce online. According to Wolf et al. (2005) many shoppers still prefer supermarkets for produce shopping because they are more convenient. Bozkurt (2010) conducted a study researching the differences in the shopping habits of physical store and online grocery shoppers. The study had two groups: the online shoppers and the in-store shoppers. In that study, the shoppers indicated that most of their shopping for fresh produce from large grocery stores. It was also found that more of the online shoppers had higher degrees in education. Similarly, Gumirakiza and Vanzee (2018) found that the majority (44 percent) of online shoppers consider grocery stores to be their most preferred market venue for fresh produce. Their study showed that there is a 33 percent likelihood that online shoppers would consider shopping for fresh produce primarily at farmers' markets. Khaniwale (2015) indicated that although consumer behavior is hard to predict, marketers should have an idea on factors that influence consumers buying habits.

3. Methodology

3.1 Data Collection Process

The data used in this study was collected between March and July in 2016 through an online-based survey. Study participants consist of a stratified random sample of 1,205 online shoppers. These are consumers who purchased online some products at least twice within six months before participating in this study. The study is geographically limited the South region of the United States as defined by the U.S. Census Bureau (2016). This region includes sixteen States: Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia, and the District of Columbia. This region was purposefully chosen for the proximity to the research team. The team sought to investigate the extent to which the online shoppers within their region attend farmers' markets. To create a research instrument (the survey), we used the Qualtrics software. It allowed us to design survey questions with advanced branching logic, accurate tracking for each respondent, block presentation, question randomization, and monitoring of responses. These features embedded in the software mitigated possible bias that could arise when respondents are taking the survey. The features also helped us to only accept responses from those subjects that actually were taking attention to the questions before answering them. To accomplish this, we included a number of short-answer questions requiring respondents to provide a correct answer after thinking. The Qualtrics survey system excluded automatically respondents who answered the questions incorrectly.

To collect data, a link to the survey was emailed to the selected subjects through the Qualtrics actively managed market research panels and social media users, provided they qualify as online shoppers residing in the South

region of the United States. We chose to use the Qualtrics because it is a professional survey software provider with extensive experience offering advanced and sophisticated online data collection tools that lead to reliable quality data. This provider partners with more than 20 entities; allowing it to make a network of respondents that meet specific sample requirements. The survey contained a total of 44 questions. We have identified those that are relevant to this topic of study. The dependent variable is related to a categorical question with three categories. Respondents were asked to indicate how often they attend a farmers' market per year; on average. Categories/alternatives/options were: (i) never attends, (ii) occasionally (1-3 times), (iii) frequently (more than 4 times). Descriptive statistics about the consumer characteristics that we included in the model as explanatory variables are presented in Table 1.

3.2 Model Specification

In order to estimate relative probabilities for the market frequency alternatives/options, we determined that a multinomial logistic model is the most appropriate approach. According to Chan, (2005) the structure of a multinomial model is used to predict the likelihood that the j^{th} alternative in a set of unordered multiple alternatives (J) is chosen. The dependent outcomes for this study are assumed to not be in a certain order. It is assumed that the Independence from Irrelevant Alternatives (IIA) holds true. This suggests that adding a new choice option in the choice set does not affect the relative odds (Train, 2009). Finally, we assume that an online shopper selects an option he/she believes provides the highest utility. As indicated by Onozaka and Thilmany-McFadden (2011) the individual utility (U_{ij}) is derived from the choice set as a linear function of the individual's characteristics plus an error term. Equation (1) below illustrates this concept:

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

V_{ij} is the deterministic component of the utility. The ε_{ij} is the random component. As in Kennedy (2008) we assume that it is independently and identically distributed according to an extreme value $F(\varepsilon_{ij}) = \exp(-\exp(-\varepsilon_{ij}))$. This assumption makes the logistic model appropriate. The choice of a specific j^{th} option among the J options is driven by a latent variable or indirect utility; V_{ij}^* specified in Equation (2) below:

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

The X_{ij} is a vector of the shopper's characteristics. The parameter β is to be estimated and is assumed to differ across the J options. The μ_{ij} is an error term that accounts for the factors that are not included in the model. As researchers, we do not observe individual's utility. What we are able to observe the shopper's choices. Consequently, Equation (3) illustrates the observed choice y_i of an individual i .

$$y_i = 1 \Leftrightarrow V_{i1}^* > V_{ij}^* \forall j, y_i = 2 \Leftrightarrow V_{i2}^* > V_{ij}^* \forall j, \dots, y_i = J \Leftrightarrow V_{iJ}^* > V_{ij}^* \forall j \quad (3)$$

As in Kennedy (2008) the probability (P) that an individual i chooses alternative j is expressed in Equation (4) as:

$$P(y_i = j) = \frac{e^{\beta_j X_i}}{1 + e^{\beta_j X_i}} \quad (4)$$

The β 's are identified by setting the $\beta = 0$ for one reference alternative j^* . In this analysis, the "never attends" option is the reference category. From equation (4), the parameter estimates will be obtained as follows:

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

Because $\beta_{j^*k} = 0$ for the reference alternative, Equation (5) reduces to:

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

Schmidheiny (2007) indicated that for continuous independent variables, positive parameters β_{jk} suggest an increase in the likelihood for the specific option j relative to the j^* . For binary independent variables, the β_{jk} are probability differences between 0 and 1. Marginal effects can be computed using Equation (7) below:

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

The null hypothesis is that there is no shopper characteristic with a significant impact on the relative probability of selecting a specific j option. That is

$H_0 \equiv \beta_{kj} = 0; \forall k = 1, \dots, K; j = 1, \dots, J$. The alternative hypothesis is that each of the shopper characteristics has a significant impact on the relative probability of selecting a specific j option. That is, $H_1 \equiv \beta_{kj} \neq 0; \forall k = 1, \dots, K; j = 1, \dots, J$.

4. Presentation and Discussion of Results

4.1 Descriptive Statistics

Table 1 indicates the descriptive statistics for the independent variables that are included in the model. They are conveniently displayed per each of the three choice alternatives/options in the dependent variables. This makes it expedient to know average consumer characteristics of those online shoppers who never attends farmers' markets, those who attend occasionally, and those who attend frequently. It also presents the overall statistics for the sample participants. Some of the variables are coded in a way that needs explanations. The GovAssistance is a binary variable for respondents who participate in food stamps, WIC, and/or senior nutrition assistance programs. The "FMSPendperVisit" represents the amount of money respondents spend or would spend per one visit at farmers' market. The "InterestLevelLocalFP" represents a 5-likert scale of levels of interest respondents have in locally grown fresh produce. Respondents were told that a 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. They were then asked: Would you consider subscribing to a local CSA program? Therefore, WouldConsiderCSASubscrab is a dummy variable for which 1 represents those respondents who would consider joining a CSA. "MonthlySpendFreshProduce" represents respondent's average monthly expenditure on fresh produce.

Table 1. Descriptive statistics by farmers' market attendance

Variable	Never Attends	Occasionally (1-3 times)	Frequently (4+ times)	Total
Age	47	46	47	47
Urban	0.755	0.764	0.748	0.756
Female	0.654	0.567	0.586	0.617
Married	0.501	0.638	0.602	0.56
Affluent	0.316	0.426	0.423	0.368
Locavore	0.646	0.804	0.821	0.724
Caucasian	0.818	0.840	0.821	0.82
GovAssistance	0.171	0.110	0.163	0.153
Married_Urban	0.370	0.488	0.459	0.42
Married_Female	0.330	0.347	0.325	0.334
Educated_Urban	1.393	1.531	1.573	1.467
Educated_Female	1.153	1.028	1.167	1.122
FMSPendperVisit	30.37	44.61	50.79	38.392
AgeCategory_Female	1.455	1.282	1.297	1.376
Interest_LevelLocalFP	3.521	4.19	4.358	3.873
WouldConsiderCSASubscrab	0.363	0.549	0.524	0.446
MonthlySpendFreshProduce	42.79	69.837	80.618	57.831
Freq.	633	326	246	1,205
Percent	53	27	20	100

The statistics in Table 1 show the majority (53 percent) of online shoppers have never attended farmers' markets. This means that there are major reasons behind this statistic. In fact, the study asked those who never attended to indicate the main reasons for not attending. We found that the 38 percent reported the lack of awareness. We also found that 31 percent consider market locations and/or time to be inconvenient. Another finding was that 27 percent indicated that they do not attend simply because they are not interested in farmers' markets. The remaining four percent cited "other" reasons. Furthermore, statistics in Table 1 show that only 36 percent of these online shoppers indicated that they would consider subscribing for CSA programs. The average interests in locally grown fresh produce is 3.5 out of a 5-likert scale. It is the lowest compared to the other two groups. The statistics further indicate that 27 percent of the online shoppers attend farmers' markets occasionally while 20

percent attend frequently. On a 5-likert scale, the average interests in locally grown fresh produce is 4.19 and 4.36 for occasional and frequent attendees respectively. We found that 55 percent of occasional attendees indicated that they would consider joining the CSA programs. Likewise, 42 percent of frequent attendees indicated that they would consider subscribing. This finding suggests that growers of fresh produce should revise their marketing strategies aiming at those consumers in the online marketplace.

The descriptive statistics in Table 1 indicate that the average online shopper is 47 years old. The average shopper would spend \$38.39 at a farmers' market per one visit. This shopper spends an average of \$57.83 on locally/regionally grown fresh produce per month. The statistics show that 76 percent of the respondents live in urban areas, 62 percent were female, 56 percent are married, 37 percent come from wealthier backgrounds, 72 percent are locavores, 82 percent are Caucasian, and 15 percent receive some form of food assistance from the government. Statistics for each frequency of visiting a farmers' market is shown in Table 1. For example, for an online shopper that never goes to a farmers' market is 47 years. If he/she ever attends, this average person would spend \$24.65 at a farmers' market per one visit; which is lower compared to those among occasional and frequent attendees. Among those online shoppers that said they occasionally go to farmers' markets, 76 percent live in areas they consider as urban, 57 percent are female, 64 percent are married, 42 percent reported income that is above the sample mean, 80 percent are locavores, and 11 percent receive some sort of food assistance.

4.2 Regression Results

The main purpose of this study is to estimate relative probabilities associated with farmers' markets attendance among online shoppers. As previously explained, a multinomial logistic model regression was applied. The dependent variable consists of three unordered categories describing the frequency of attending farmers' markets: (1) never, (2) occasionally (1-3 times), and (3) frequently (4+ times). We used Stata software to run the regression. Results in Table 2 are coefficient estimates that were computed using the `mlogit` command. As previously indicated, "never attends" was used as the reference category.

Table 2. Coefficients estimates from the multinomial logit regression

Independent Variables	Occasionally (1-3 times)	Frequently (4+ times)
Age	-.0072	.0040
Urban	-.6194	-.9141*
Female	.1730*	.3935
Married	.4863	.2413
Affluent	.1309**	.0828
Locavore	.3037*	.3059
Caucasian	.2117	-.0324
GovAssistance	-.4667**	.0302
Married_Urban	-.1056	.1103
Married_Female	-.1593	-.2573
Educated_Urban	.4021***	.4254**
Educated_Female	-.2424	.1800
FMSpendperVisit	.0034*	.0048**
AgeCategory_Female	.1358	-.0760
Interest_LevelLocalFP	.5601***	.8071***
WouldConsiderCSASubscrab	.3637***	.1586
MonthlySpendFreshProduce	.0029**	.0039***
Constant	-3.4424***	-4.9713***
Base outcome	Never Attends	

Note. The *, **, *** which represent significance at the 10%, 5%, and 1% levels, respectively.

The coefficient estimates in the Table 2 are coefficient estimates and interpreted in comparison to this reference category (never attends a farmers' markets). A positive coefficient estimate shows that an increase in the variable increases in the relative probability of the corresponding outcome. A negative coefficient implies the opposite. For example, being a female [increase from 0 (male) to 1 (female)] increases the likelihood of going to farmers' markets occasionally, with reference to those who never attend. Similarly, being a locavore has a significant

positive effect on choosing to attend occasionally. Affluent online shoppers are significantly more likely to attend occasionally. As expected, we found that those shoppers with greater interests in locally grown fresh produce are significantly more probable to attend farmers' markets either occasionally or frequently. On the other hand, the estimates suggest that online shoppers who receive food-related assistance are less likely to attend farmers' markets. Online shoppers in urban areas are less likely to attend frequently.

The relative probabilities and marginal effects for each of the frequencies are shown in Table 3. The marginal effects were computed applying the `mfx2` command after the `mlogit` command. The overall probabilities for each of the categories in the dependent variable are indicated in the first row. These predicted likelihood values are very close the actual descriptive statistics in Table 1. This implies that the model we used for this analysis is adequate. Marginal effects are interpreted as how much a one additional unit in the corresponding variable changes overall probability for a specific category.

Table 3. Marginal effects from the multinomial logit model

Variable	Pr (y = Never) = 54%	Pr (y = Occasionally) = 28%	Pr (y = Frequently) = 18%
Age	.0007	-.0016	.0010
Urban	.1837**	-.0698	-.1140*
Female	.0655	.137*	.0518
Married	-.0956	.0836	.0120
Affluent	-.0278	.0220**	.0058
Locavore	-.0750**	.0446*	.0305
Caucasian	-.0269	.0424	-.0155
GovAssistance	.0604	-.0873***	.0269
Married_Urban	.0044	-.0266	.0222
Married_Female	.0491	-.0189	-.0303
Educated_Urban	-.1022***	.0584**	.0438*
Educated_Female	.0179	-.0575*	.0396
FMSpendperVisit	-.0010**	.0004	.0006**
AgeCategory_Female	-.0125	.0310	-.0184
Interest_LevelLocalFP	-.1639***	.0704***	.0935***
WouldConsiderCSASubscri	-.0699**	.0647***	.0051
MonthlySpendFreshProdu	-.0008***	.0004*	.0004***

Note. The *, **, *** which represent significance at the 10%, 5%, and 1% levels, respectively.

Results in Table 3 above indicate that the relative probability for an online shopper to have never attended a farmers' market is 54 percent. These findings show that being an online shopper in urban area increases the likelihood to never attend a farmers' market by roughly 18 percent. This suggests that as online shopping becomes increasingly popular, farmers' markets that are located in urban areas will have to find ways to adopt to the change. They need to develop new marketing techniques to increase the number of consumers. However, results show that educated urban online shoppers are more likely to attend. They are 10 percent less likely to never attend; in comparison with less educated rural online shoppers. There is a fall in probability for locavore, those interested in local fresh produce, and online shoppers that would consider a CSA subscription of eight percent, 16 percent, and seven percent, respectively, to choose to never go to a farmers' market.

The relative probability that an online shopper will "occasionally" attend farmers' market is 28 percent. We found that females are almost 14 percent more likely to attend occasionally attend farmers' markets. There is an increase likelihood of five percent in the probability for locavore and a six percent increase for educated urban online shoppers to occasionally go to a farmers' market. Likewise, an incremental increase in the interests in locally grown fresh produce leads to a seven percent increase in the probability for online shoppers to be an occasional farmers' market attendee. Similarly, those that would consider a CSA subscription are almost seven percent more probable to occasionally shop at farmers' market. We found that a \$100 increase in the monthly expenditures on fresh produce by online shoppers would increase the chances of attending farmers' market either occasionally or frequently by four percent. However, there is a decline of nine percent in probability for online shoppers that receive government assistance to go to a farmers' market occasionally.

The relative probability for an online shopper to frequently shop a farmers' market is 18 percent. The results demonstrate that there is an 11 percent decline for online shoppers that live in urban areas to frequently go to a farmers' market. On the other hand, we found an increase of four percent in the likelihood for educated urban online shoppers to frequently attend a farmers' market. We further report that a unit increase in the interests in local fresh produce raises the probability to frequently attend a farmers' market by nine percent. In the same fashion, the likelihood for online shoppers to attend farmers' markets frequently increases by seven percent for online shoppers that would consider a CSA subscription. These findings are important to farmers' markets and local growers who would advertise and reach out to more customers, especially within the online environment.

5. Conclusion

Farmers' markets have recently gained popularity. Reasons include the desire for more fresh produce, wanting to help local farmers, and social interactions. The fact that more people are changing to a healthier lifestyle has also helped farmers' markets greatly, but many people still have a hard time finding time to go to the markets. Likewise, online shopping is increasingly becoming common for many consumers. As this trend continues, it is valuable to explore farmers' attendance habits among online shoppers. In this study, we used survey-based data and a multinomial logit model to explain how frequent online shoppers go to farmers' markets. The study focused on consumers who made at least two online purchases six months before they filled out the survey. Study participants consist of 1,205 online shoppers living within the Southern region of the U.S. participate in this study.

Main findings indicate that the probabilities of online shoppers to never, occasionally, frequently attend farmers' markets are 54 percent, 28 percent, and 18 percent respectively. Those online shoppers with greater interests in locally grown fresh produce, those who would consider joining CSA programs, and the locavore are very significantly more likely to attend either occasionally or frequently. Urban online shoppers are less likely to go to farmers' markets.

Findings from this study suggest several marketing strategies for local fresh produce growers, farmers' markets, and research community. For example, growers, especially those who participate in the CSA programs could increase the number of subscriptions by targeting occasional and frequent market attendees. Regarding farmers' markets, the findings clearly encourage them to revise their marketing strategies treating online shoppers as a new market segment. In doing so, they should prioritize those shoppers with interests in locally grown produce. They should develop educational strategies aimed at increasing awareness and interests in buying local fresh produce. It has been found that such interests lead to increased farmers' market attendance. Future researchers could find this beneficial for further investigation. They should for example study reasons why the majority of consumers in the online marketplace never attended farmers' markets, whether they would purchase fresh produce online, and/or their likelihood to attend in future. We finally recommend any further study that attempt to predict the future of farmers' market attendance given the increasingly popularity for online shopping.

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