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# An Analysis of Oklahoma Direct Marketing Outlets: Case Study of Produce Farmers' Markets

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## Abstract

*The objectives of this study are to examine consumer preferences among various marketing channels including direct marketing in Oklahoma, and to analyze the impact of various demographic variables on purchasing choice. Specifically, this research focuses on the links between demographic factors and shopping preferences. Data from consumers' survey in 21 farmers' markets in Oklahoma will be used to analyze consumer preferences using an ordered logistic regression analysis method. Farmers' market producers and market managers were also surveyed. The results of this study identify consumer characteristics that influence produce demand and consequently growers' return at Oklahoma farmers' market.*

## Introduction

Per capita consumption of vegetables shows an increasing trend in the U.S. In 2001, per capita consumption of vegetables including melon was 441.0 lb, and estimated to increase to 444lb in 2003 (USDA, 2003). Today's consumers view fresh produce as a source of fiber and desirable nutrients. The nutritional concerns as well as security and food safety concerns have increased the interest in locally grown produce with known sources of origin (Brooker, et al., 1987). With this growing demand for fresh produce comes an opportunity for farmers to increase their individual returns, specifically, through the use of direct markets.

In Oklahoma, there has been a recent increase in demand for food products marketed through direct channels and a subsequent increase in the effort on part of Oklahoma Department of Agriculture to develop and improve farmers' markets throughout the state. The 2000 National Farmers Market Directory lists over 2,800 farmers' markets that operate across the United States. The number had increased to over 3,100 farmers' markets in 2002. The increase in the number of farmers' market is "mostly due to the growing consumer interest in obtaining fresh products directly from the farm" (USDA, 2003). The objective of this study is to determine the importance of factors affecting demand for products offered at Oklahoma farmers' markets. More specifically, the purpose is to examine factors impacting consumer preferences among various marketing channels available in Oklahoma, including direct producer to consumer markets. The objective was accomplished using ordered logit analysis.

Past research studies have identified consumer and demographic characteristics as important in the development of farmers' market in various states across the U.S.

Kuches et al. (2000) investigated the impact of farmers' market consumers' characteristics in New Jersey on their purchasing decisions using a Tobit model. Kezis et al. (1998) conducted a study of consumers at a small farmers' market in Maine to identify demographic characteristics of consumers at the market and to evaluate consumer attitude toward products they purchased at the market. Govindasamu et. al. (2000) used qualitative modeling to determine marketing factors and socio-demographic characteristics that were important in the likelihood of consumers purchasing from the farmers' markets.

**Survey Description**

Surveys of farmers' market participants (Consumers, Producers, and Market managers) were conducted in order to gather the data for the analysis, including the ordered logit estimations. The first survey that was conducted was the *customer survey*. The Kerr Center for Sustainable Agriculture conducted the surveys in 2002, during the farmers' market season. There were 29 active farmers' markets in Oklahoma during survey periods, and 21 of them were chosen randomly for the survey. A total of 690 questionnaires were distributed randomly to customers at those 21 markets. The response rate was 57 percent. For the purpose of the study 312 useable returned questionnaires were analyzed.

The second survey was the *market producer's survey*. The survey was conducted at the same 21 farmers' markets, which were chosen before for customer survey. There were 425 questionnaires distributed and the response rate was 15 percent. The third survey was a *market manager survey*, targeting market managers from the same 21 farmers' markets as before. The response rate was 43 percent.

**The Survey Results**

The surveys provided information on consumer, producer, and market manager demographic characteristics and their views on important factors in the success of farmers' markets. In the first part of this section a summary of these characteristics and views will be given. In the second part the results of the logit analysis of the consumers' survey will be given.

**Consumer Survey**

*Demographic Characteristics of Consumer Respondents***.** To better understand who constitutes Oklahoma farmers' market customers; respondents were questioned on their demographics characteristics such as age, education, and annual household income. The surveys showed that seventy-nine percent of respondents are women and 97 percent indicated that they are the primary shopper in their household. Respondents age distribution indicate that approximately 65 percent of Oklahoma farmers' market consumers are older than 51. None of surveyed shoppers were younger than 20 years old, which was consistent with the survey result from previous studies in other parts the U.S. (Eastwood et al., 1999; Kezis et al., 1998).

With respect to education, the range was distributed anywhere from middle school to doctorate degree. Around 18 percent of the respondents indicated education up to high school; 30 percent indicated some college education, and 41 percent said they had a minimum of undergraduate education. With regard to the respondents' household annual income, 35 percent of respondents had incomes of below $40,000, while 65 percent have income at of least $40,000. The relatively high education and income level of farmers' market respondents on this survey is consistent with other farmers' market studies

conducted for other parts of the U.S. (Eastwood et al., 1999; Kezis et al., 1998). The statistics with regard to Oklahoma farmers' market customers are summarized in table 1.

*Purchasing Patterns*. To get a better understand of demand for various items offered at the markets, respondents were asked to list products that they normally purchased at farmers' markets. Results showed that 70 percent of the respondents purchased vegetables regularly, while 41 percent purchased fruit regularly, at the market. On the other hand, around 68 percent of respondents indicated that they never purchased cheese at the farmers' markets, 65 percent never purchased meat, and 62 percent never purchased dried herbs. This is not surprising, as these items were not offered at many of the markets where these surveys were conducted. Additionally, respondents were asked about the frequency of their visits to the farmers' markets during 2001. About 32 percent of Saturday's farmers market's respondents visit the market weekly, 23 percent visit every other week, and 12 percent visit once a month. When respondents were asked about their average money spending each time they visit the market, 29 percent said they spend $5 to $10, 31 percent spend $10 to $15, and 24 percent spend $15 to $25.

*Customers' Reasons for Shopping at Farmers' Market*. Customers in Oklahoma's farmers market identify 'quality' as a very important factor affecting their choice to shop at the farmers' markets. Other factors identified were availability of in season products (54 percent) and the fact that the products were grown in Oklahoma (47 percent). Previous studies (Kezis et al., 1988) had identified price as a critical factor in the decision to shop at the farmers' market. In Oklahoma, the most important reasons for shopping at the farmers' market identified by respondents were 'product quality and freshness' (40 percent), and 'to support of local farmers and businesses' (38 percent).

**Producer Survey**

*Farmers' Market Producers Demographic Characteristics*. The age distribution indicated that most producers (65 percent) of Oklahoma farmers' markets are older than 46 years of age. Producers younger than 25 years old are unavailable in this survey. Another characteristic of Oklahoma farmers' markets' producers is education. Around 20 percent of the respondents have education up to high school; 27 percent have some college education; 23 percent have undergraduate school education, and about 19 percent have a master's degree and above (Table 1).

The other characteristic of farmers' market producers is annual household income. Forty nine percent of respondents have household annual incomes of $39,999 and below; 24 percent have income between $40,000 and $59,999; 19 percent have income between $60,000 and $79,999 and 8 percent have income at least $80,000. Majority of farmers' market producers primary occupations are non-agricultural and vegetable farming, and the average length of time they have been working on their primary occupation, is about 13.7 year.

*Examination of Factors Related to Production and Marketing of Products Offered at Oklahoma Farmers' market.* Producers were asked to rank the reasons for choosing farmers' markets as an outlet for their produce sales. The rankings were from one to seven, and one being the most important. The respondents gave 'convenience', 'receive retail value for products sold', 'customer interaction', 'to advertise products', 'to sell excess products not sold through other outlets', and 'to sell surplus produce from own garden' as reasons for selling their produce at the farmers' market. Moreover, the results showed that 44 percent of the producers indicated, 'to receive retail value for products

sold' was the most important reason for producer to sell their products at the farmers' markets. Twenty seven percent of respondents gave 'customer interaction' was an important reason as well.

In order to increase sales, farmers' market producers usually advertise their products. With regard to promotion strategies, around 58 percent of the producers said using a 'sign indicating price' was a very effective method of increasing sales and 27 percent indicated that using a 'sign for product information' was also very effective. Producers were also asked to describe how they normally determine prices for the product they sell at farmers' market. Twenty seven percent of respondents indicated that the most common method used to determine prices was grocery store comparison, 22 percent said matching other vendors prices and 19 percent said that they determined prices based on cost of production plus mark up.

In order to obtain data on the source of the products sold at farmers' markets, respondents were asked, 'What percentage of all the products that you sell at farmers' market is grown or prepared by you and your employees (not resold)". Seventy-nine percent of the respondents said that they or their employees grew/prepared the products. Products sold at farmers' market can be fresh produce or value added products. One of the surveys questions, the respondents were asked if they sold value added products such as baked goods, preserves, and dried flowers. Thirty three percent of respondents indicated that they sell value added products, among those, most of them (86 percent) having added value to the items which they have grown themselves.

*Producers Perceptions of Customer Characteristics at Farmers' Market*. In one part of the survey, producers were asked about their perception of the characteristics of their

customers. From the customers' survey, the majorities of consumer at farmers' market were female, with an age of at least 36 years of old, had an annual household income of at least $36,000, highly educated, and came from a two-adult household. In the other hand, when producers were asked about their customers; 66 percent of the producers said the customers came from 'medium income', and 'retired', 56 percent said their customers are 'very health conscience', 55 percent said they are 'educated', and 53 percent they are 'married with children'.

Producers were asked to rank quality characteristics that they thought consumers place value on when making their choice to shop at farmers' markets. Around ninety percent of producers said that product quality is very important to their customers. Another quality characteristic that is very important to customers according to producers were 'grown or made by the vendor' (72 percent of producers), and 'Oklahoma grown' (65 percent of producers).

**Farmers' Market Manager Survey**

*Farmers' Market Managers Demographic Characteristics*. Out of 9 farmers' market managers being surveyed, about 11 percent were between 26 and 35 years old, while 88 percent were between 36 and 55 years of age (Table 1). There were no farmers' market managers younger than 25 years old who responded to the survey. The education characteristics are as follows: about 22 percent of the respondents have education up to high school; and the rest has at least some college education. Twenty two percent of respondents earn less than $40,000 in annual household income, 34 percent have income between $40,000 and $59,999, 22 percent have income between $60,000 and $79,999 and 22 percent have income at least $80,000.

The farmers' market managers were asked, " how would you describe the position as a market manager/coordinator"? About 34 percent of the market managers are volunteers, 11 percent are employed by the farmers' market organization, 11 percent are employed by the city and 11 percent are employed by the county. Among the farmers' market managers, 50 percent allocated quarter their time for managing/coordinating the farmers' market. When the farmers' market managers were asked on the number of years that they have been working as a farmers' market manager, around 63 percent has been working as farmers' market manager for at least 6 years and all respondents claimed they have never received any specialized training as a market manager, but most of them have a farming experience background.

*Appearance and Ease of Access of Farmers' Markets*. Infrastructures at the farmers' market location play an important role in the success of farmers' market, because generally, good infrastructures will attract more consumers. On the question of infrastructure, farmers' market managers were asked to give value of 'very important', 'important', and 'not important' the following item: restroom, electric hookups, convenient parking, ample parking, water fountains, hand washing facilities, shade from trees, shade from structures, refrigeration, picnic area, and concessions. The results indicated, that as stated by all of the respondents to market manager surveys, convenient and ample parking is very important; while 67 percent of market managers stated shade is very important. Another structural consideration was the availability of restrooms, which was stated as very important by 56 percent of market managers.

When choosing sites for farmers' market operation, there are many factors that are considered by market managers. Around 44 percent of farmers' market managers

stated that 'site provided by community' was the most important factors to be considered, the other factors was 'cost of the site'. Overall, 56 percent of market managers are 'mostly satisfied' with the current farmers' market location and there were 11 percent of the market managers that stated they were not satisfied with the current location.

**Method of Analysis**

The models correspond to the objective of this study, which is examining consumer preferences among various marketing channels, including direct marketing. One of the questions on the consumer survey asked the respondents about their preferences on the marketing outlets. The ordered logit used in this study is one of the extensions of the logit model where the dependent variables are in the form of an 'ordinal scale' which means that measurements represent the ranks of variable values (Allison, 1991). However, the intervals between the numbers are not necessarily equal. Using an ordered logit model or cumulative logit model, the question responses was analyzed in relation to respondents demographic and other characteristic information provided in responses to other survey questions. More specifically, the model was used to predict the likelihood of a consumer obtaining most of their fruits and vegetables during the market season, from each of four different marketing outlets (farmers' market, roadside stand, grocery store, and discount super-store), given certain characteristics of the respondents. The are seven explanatory variables: age, gender, have children under 18 years of age, neighborhood, education, income, and number of years they have been visiting the farmers market. Another important results interpreted were odd ratio, which was 'the ratio of the expected number of times that an event will occur to the expected number of times it will not occur" (Allison, 1991, p11). The model specification:

$$\text{logit}\,(F_{ijk}) = \alpha_{jk} + \sum_{g} \beta_{jg} X_{ijg} \qquad (1.1)$$

Where:

*i = 1, 2,.., 312* is the total observation, in this case the number response customers;

*j= 1, 2, 3, 4* is number of dependent variables. Dependent variables here are farmers' market, roadside stand, grocery store, and discount super store;

*k= 1,2* is the levels at the dependent variables;

*g =1, 2,..,6* is the number of independent variables, as mention before.

$F_{ijk}$ is the cumulative probability that individual i obtain most of his/her produce from specific source *j*. Since all independent variables were in discrete values, dummy variables were created to accommodate the models. The dummy variables were as follows:

*Age_1* is set to 1 if the respondent's age is below 20 and 0 otherwise; *Age_2* is set to 1 if the respondent's age is 21-35, and 0 otherwise; *Age_3* is set to 1 if the respondent's age is 36-50, and 0 otherwise; *Age_4* is set to 1 if the respondent's age is 51-65, and 0 otherwise; and *Age_5* is set to 1 if the respondent's age is 66-75, and zero otherwise; *Gender* is set to 1 if respondent is male, and 0 otherwise;

*Children* is set to 1 if respondent has kids under 18 years of age, and zero otherwise; *Suburb_1* is set to 1 if respondent lives in suburban area, and 0 otherwise; *Suburb_2* is set to 1 if respondent lives in urban area, and 0 otherwise;

*Education_1* is set to 1 if respondent had a grade school education, and 0 otherwise, *Education_2* is set to 1 if respondent had a high school education, and 0 otherwise, *Education_3* is set to 1 if respondent had some college education, and 0 otherwise, *Education_4* is set to 1 if respondent had undergraduate education, and 0 otherwise,

*Education_5* is set to 1 if respondent had a grade school education, and 0 otherwise, and *Education_6* is set to 1 if respondent had a master degree, and 0 otherwise;

*Income_1* is set to 1 if the household's annual income is less than $ 20,000, and 0 otherwise; *Income_2* is set to 1 if the household's annual income is $20,000 - $39,999, and 0 otherwise, *Income_3* is set to 1 if the household's annual income is $40,000 - $59,999, and 0 otherwise, *Income_4* is set to 1 if the household's annual income is $60,000 -$79,999, and 0 otherwise, and *Income_5* is set to 1 if the household's annual income is $80,000- $99,999, and 0 otherwise;

*Visits_1* is set to 1 if the numbers of years they have been visiting farmers' market is 1 year, and 0 otherwise, *Visits_2* is set to 1 if the numbers is 2-3 years, and 0 otherwise, *Visits_3* is set to 1 if the numbers is 4-5 years, and 0 otherwise, and *Visits_4* is set to 1 if the numbers is 6-10 years and 0 otherwise.

For estimation purposes, one classification was eliminated from each group of variables to prevent perfect co-linearity. The models were analyzed using Statistical Analysis Software (SAS Institute, Inc).

**Ordered Logit Results**

Since they were four distinctive dependent variables (farmers' market, roadside stand, Grocery store and Discount superstore) four equations were estimated separately. Each equation had the same independent variables, which were age, gender, children, neighborhood, education, income and the number of years participating at farmers' market.

*Farmers' Market Model*. Among the seven independent variables that entered in the model, four of them were significant at explaining the variability of the dependent

variable. The variables were consumers' age, consumers' neighborhood where they are resided, education, and income. Results also showed that respondents who live in urban and suburban areas are most likely to obtain most of their fruit and vegetables from a farmers' market (Table 2). The odds of respondents from urban areas is twice as the odds of respondents from rural area, and the odds of respondents from suburban areas is 1.5 times the odds of respondents from rural areas. This result was consistent with the finding from study by Govindasamu et. al. (2000).

*Roadside Stand Model*. In this model, only age and gender variables were statistically significant. Among 6 age categories, age range 21-35 and 66-75 are more likely to obtain most of their produce from roadside stand and age 36-50 and 51-65 are less likely to obtain most of their produce from roadside stand (Table 2). The results also identified that male customers were less likely to obtain their fruit and vegetables from a roadside stand. The odds of male is 0.7 the odds of female.

*Grocery Store Model.* There were only two significant demographic variables for the grocery store model. Those variables are income and number of year's respondents visiting the farmers' market. Respondents with income < $20,000 and between $20,000-$39,999 are more likely to obtain most of their produce from a grocery store (Table 2). The odds of respondents in the income category < $20,000 is 2.3 times the odds of respondents in income categories >$100,000, and the odds of respondents in income category $20,000-$39,999 is 1.1 of that in categories >$100,000.

*Dependent Variable Discount Superstore.* There are no significant variables for this model.

**Summary and Conclusion**

The survey results revealed the typical characteristics of Oklahoma farmers' markets consumers in a fashion that is consistent with the conclusions of similar studies conducted in other regions of the U.S. The majority of consumers are women, age 36 or older, highly educated, with a household income of $40,000 or higher, and coming from a two-person household.

Related to the consumers shopping pattern, most of the consumers came to farmers' market to buy fresh fruit and vegetables because of the expectation of the quality of fresh produce at farmers' market is higher compare to other outlets. The most important consumers' reason to shop at farmers' market are 'product quality and freshness', and to 'support local farmers and businesses'.

The ordered logistic regression results identified that various demographic factors affect customers' preferences toward various marketing outlet. Respondents' age, neighborhood, education, and income influence the choice of farmers' market as a source of their fresh produce. While consumers' age and gender were also significant in identified consumer's preference toward buying fresh produce from roadside stand outlet. Furthermore, consumer's income and number of year's respondents visiting the farmers' market were also significant toward predicting the likelihood that respondent obtains most of their fresh produce from grocery store.

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TABLE 1. Demographic Characteristics Of Oklahoma Farmers' Market Consumer, Producer and Market Manager

| Characteristics | | Percentage of Respondents | | |
|---|---|---|---|---|
| | | Consumer (N = 312) | Producers (N = 64) | Market Managers (N = 11) |
| Sex: | Male | 21 | 34 | 33 |
| | Female | 79 | 62 | 67 |
| Percent households with children | | | | |
| Under 18 years | | 19 | 25 | - |
| Age: | < 20 | 0 | 0 | 11 |
| | 21 – 35 | 7 | 6 | 44 |
| | 36 – 50 | 28 | 50 | 44 |
| | 51 – 65 | 40 | 21 | 0 |
| | 66 – 75 | 14 | 15 | 0 |
| | > 75 | 10 | 8 | 0 |
| Education: | Grade School | 2 | 5 | 22 |
| | High School | 16 | 15 | 22 |
| | Some College | 30 | 27 | 22 |
| | Undergraduate | 20 | 23 | 0 |
| | Some Grad School | 11 | 11 | 34 |
| | Masters | 16 | 16 | 0 |
| | Doctoral | 5 | 3 | 0 |
| Annual Household Income: | < $ 20000 | 13 | 19 | 0 |
| | $ 20000 - $ 39999 | 22 | 30 | 22 |
| | $ 40000 - $ 59999 | 25 | 24 | 34 |
| | $ 60000 - $ 79999 | 18 | 19 | 22 |
| | $ 80000 - $ 99999 | 10 | 5 | 22* |
| | > $100000 | 12 | 3 | - |
| Neighborhood: | Urban | 39 | 8 | - |
| | Suburban | 43 | 10 | - |
| | Rural | 18 | 82 | - |
| Ethnicity: | African American | 3 | 0 | 0 |
| | American Indian | 7 | 2 | 0 |
| | Asian / Pacific Islander | 0 | 3 | 0 |
| | Middle Eastern | 1 | 2 | 0 |
| | Caucasian | 88 | 88 | 100 |
| | Hispanic | 1 | 2 | 0 |
| | Others | 0 | 3 | 0 |

Note: * $80,000 and above

Source : Oklahoma Farmers' market Consumers, Producers and Market Managers Surveys, 2002.

TABLE 2. The Coefficients Estimate of Ordered Logistic Regression Models

| Independent Variables | | Parameter Estimates | | |
|---|---|---|---|---|
| | | Farmers' market | Roadside Stand | Grocery Store |
| | Intercep1 | -0.349 | 0.006 | 0.318 |
| | Intercep2 | 3.320* | 1.261* | 3.791* |
| Age_2 | 21 – 35 | -0.494 | 0.356 | - |
| Age_3 | 36 – 50 | -0.319 | -0.376* | - |
| Age_4 | 51 – 65 | 0.236 | -0.363* | - |
| Age_5 | 66 – 75 | -0.340 | 0.575* | - |
| Gender | Male | - | 0.189 | - |
| Children | Children | - | - | - |
| Suburb_1 | Suburban | 0.332* | - | - |
| Suburb_2 | Urban | 0.067 | - | - |
| Education_1 | Grade School | -0.252 | - | - |
| Education_2 | High School | 0.664* | - | - |
| Education_3 | Some College | 0.581* | - | - |
| Education_4 | Undergraduate | -0.140 | - | - |
| Education_5 | Graduate School | -0.244 | - | - |
| Education_6 | Masters | -0.649* | - | - |
| Income_1 | <$20,000 | -0.167 | - | 0.912 |
| Income_2 | $20,000 - $39,999 | 0.714* | - | 0.068 |
| Income_3 | $40,000 - $59,999 | -0.245 | - | -0.240 |
| Income_4 | $60,000 - $79,999 | 0.188 | - | -0.257 |
| Income_5 | $80,000 - $99,999 | -0.465 | - | -0.544 |
| Visits_1 | 1 year | - | - | 0.184 |
| Visits_2 | 2 - 3 years | - | - | 0.338 |
| Visits_3 | 4 - 5 years | - | - | -0.286 |
| Visits_4 | 6 - 10 years | - | - | -0.543 |

Note: * Significant at 5 percent level

Source: Oklahoma Farmers' Market Consumers Survey (calculation), 2002