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Research Report: An Analysis of Consumer Perception of the Importance of Selected Attributes of Fruits and Vegetables: The Case of Tennessee

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Abstract

This paper assesses the importance of selected attributes considered by consumers in their fruit- and vegetable-buying decisions. We (i) evaluate consumer perceptions of the importance of color, freshness, variety, price, nutritional value, safety, locally grown, and knowing the grower; (ii) analyze the relationship between demographic variables and selected fruit and vegetable attributes; and (iii) discuss implications for fruit and vegetable marketing. Findings indicate that gender is significantly related to the perceived importance of color and safety. Ethnicity is related to the perceived importance of price. Education is related to perceived importance of fruit and vegetable variety. Consumers' income is directly related to perceived importance of color.

Keywords: consumer survey, preferences, demographic characteristics, fruit and vegetable attributes

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Introduction

The American food supply system is complex and ever changing. Every year, many new varieties of fruits, vegetables, and value-added products are introduced in the food marketplace. In the last few decades, Americans have become more aware of the impacts and implications of different food in their diets.

In recent years, there has been a growing interest in locally grown food (LGF) products, markets, and systems. Broadly, local foods are foods sourced from nearby producers and farmers, but the definition of LGF varies widely in the literature (Martinez et al., 2010). According to the 2008 Food, Conservation, and Energy Act, "local" includes food produced within 400 miles of its origin or within the state of its origin (Hand and Martinez, 2010). Earth Fare (2014) defines local food as sourced from within 100 miles of the store location. These definitional differences continue to challenge researchers in the debate on the importance of local food systems to local, state, and national economies (Brown et al., 2014; Ekanem, Mafuyai, and Clardy, 2016).

Palma et al. (2013) highlights the fact that the predominant food category sold at farmers' markets was fresh fruits and vegetables, as indicated in the 2007 Census of Agriculture. The literature is replete with evaluations for consumer preferences for local foods (i.e., fresh fruits and vegetables). Maples et al. (2013) survey urban consumers in major cities located in the southeastern United States on their purchases of local food directly from producers. Important consumer characteristics were college education, gender, physical activity, incidence of family illness, and knowledge of U.S. agriculture production. Willis et al. (2013) survey South Carolina consumers and evaluate their willingness to pay for locally grown foods; they conclude that consumers are willing to pay premiums for local foods under certain conditions.

Using data from the U.S. Department of Agriculture's (USDA) National Household Food Acquisition and Purchase Survey (Food APS), ERS researchers investigated the relationship between spending on fruits and vegetables and shopping at farmers' markets, roadside stands, and other direct-to-consumer (DTC) outlets. The researchers found that households that bought fruits and vegetables directly from farmers spent an average of $12.15/week at DTC outlets on these foods (USDA, 2019a).

This paper examines demographic differences in consumer perceptions of quality in fruit and vegetable on purchase behavior in a Tennessee local food market. The specific objectives are to (i) evaluate consumer perceptions of the importance of color, freshness, variety, price, nutritional value, safety, locally grown, and knowing the grower, (ii) analyze the relationship between demographic variables and selected fruit and vegetable attributes, and (iii) discuss implications for fruit and vegetable marketing.

Our hypothesis is that there is a significant relationship between consumer perceptions of the importance of the characteristics listed above and consumer gender, ethnicity, educational level, marital status and gross family income in their fruit and vegetable buying decision.

Methodology

Data for this paper were collected in 2019 using a 12-item face-to-face survey questionnaire administered to 555 shoppers from Nashville, Tennessee, metropolitan area farmers' markets. Additional data from secondary sources were used to supplement data presented in this paper. A chi-square (χ^2) test of independence was used to test for significant relationships between selected demographic variables and consumer perceptions of the importance of fruit and vegetable attributes (i.e., freshness, color, whether or not the fruit and vegetable was locally produced, price, safety, variety, nutritional value, and whether the buyer knew the farmer or grower). The χ^2 procedure examines the relationship between two or more categorical variables. IBM Statistics v. 24 and Microsoft Excel were used to analyze the data.

Results and Discussion

Approximately 33.2% of survey respondents were males, while 66.4% were females (Table 1); 66.1% were Black or African American, 23.1% were white, 6.2% identified themselves as "other," and only 4.3% did not respond. In terms of education, 16.3% of study participants had attained a high school diploma, 47.6% had attended some college, 23.6% were college graduates, 10.3% had advanced degrees, and 2.2% did not respond to this item. For the 555 respondents that answered the question regarding their marital status, 22% were married, 62.9% were single, 6.6% were divorced, 3.0% were widowed, and 5.5% did not respond to this question.

Table 1. Frequency Distribution of Demographic Variables

Demographic Variable	Percentage (%)	Demographic Variable	Percentage (%)
Gender		Marital Status	
0 = Male	33.2	0 = Married	22.0
1 = Female	66.4	1 = Single	62.9
		2 = Divorced	6.6
Ethnicity		3 = Widowed	3.0
0 = Black	66.4	4 = No response	6.6
1 = White	23.1		
2 = Other	6.2	Gross family income	
3 = No response	4.3	0 = Low (≤ $40,000/year)	35.3
		1 = High (> $40,000/year)	58.1
Educational level		3 = No response	6.6
0 = High school	16.3		
1 = Some college	47.6		
2 = College graduate	23.6		
3 = Advanced degree	10.3		
4 = No response	5.5		

Table 2 reports results of the χ^2 tests of significance. Re-categorizations of selected demographic variables of gender, ethnicity, educational attainment, marital status and gross family income were as defined in Table 1. Shoppers were asked to rank the perceived importance of color, locally grown, knowing the grower, price, safety, variety and nutrition using a 4-point scale (0 = not important at all, 1 = somewhat important, 2 = important, and 3 = very important).

Gender was significantly related to the perceived importance of color when buying fruits and vegetables ($\chi^2 = 9.594$, $p = 0.008$) as well as the perceived importance of price ($\chi^2 = 6.559$, $p = 0.087$), safety ($\chi^2 = 23.456$, $p = 0.001$), and variety ($\chi^2 = 6.277$, $p = 0.043$). While gender was significantly related to the perceived importance of color and safety at the 1% levels, it was significantly related to the perceived importance of variety and price at the 5% and 10% levels, respectively.

When buying fruits and vegetables, ethnicity is shown to be weakly related to the perception of importance of color ($\chi^2 = 10.380$, $p = 0.096$) and price ($\chi^2 = 22.634$, $p = 0.007$). These results are significant at the 10 % and 1 % levels respectively.

Table 2. Results of χ^2 Tests

Demographic Variables	Attribute	χ^2 Value	Levels of Significance (p)
Gender	Color	9.594	0.008***
	Price	6.559	0.087*
	Safety	23.456	0.001***
	Variety	6.277	0.043**
Ethnicity	Color	10.380	0.096*
	Price	22.634	0.007***
Education	Locally grown	14.808	0.096*
	Know seller	19.828	0.019**
	Variety	20.944	0.002***
	Nutrition	19.974	0.018**
Income	Freshness	4.603	0.100*
	Color	8.506	0.014**
	Variety	5.520	0.060*

Note: Single, double, and triple asterisks (*, **, ***) indicate significance at the 10%, 5%, and 1% levels, respectively.

The χ^2 tests were also conducted to investigate the relationships between educational level of the consumer and the importance of locally grown, knowing the seller, variety, and nutrition. Results show that there is a significant relationship between education and the perception that fruits and vegetables were locally grown ($\chi^2 = 14.808$, $p = 0.096$). Education is significantly related to the perceived importance of knowing the seller ($\chi^2 = 19.828$, $p = 0.019$),variety ($\chi^2 = 20.944$, $p = 0.002$), and nutrition, ($\chi^2 = 19.974$, $p = 0.018$). Finally, income plays a significant role in the perceived importance of freshness ($\chi^2 = 4.603$, $p = 0.100$), color ($\chi^2 = 8.506$, $p = 0.002$), and variety, ($\chi^2 = 15.520$, $p = 0.060$).

Conclusions

Previous consumer studies have shown that many factors influence consumer willingness to buy fruits and vegetables (Moser, Raffaelli, and Thilmany-McFadden, 2011; Thomas, Gunden, and Miran, 2015). This paper focuses on the physical characteristics that are observable, valuable, and known to fruit and vegetable consumers.

We find that consumers' gender, ethnicity, education, and income play important roles in the perception of fruit and vegetable attributes such as color, freshness, variety, price, nutritional value, safety, locally grown, and knowing the grower. The χ^2 tests showed the existence of relationships between demographic variables and selected fruit and vegetable attributes: Gender was significantly related to the perceived importance of color, price, safety, and variety; ethnicity was related to the perceived importance of color and price. Education was related to the perceived importance of locally grown, knowing the seller, variety, and nutrition. Income was related to the perceived importance of freshness, color, and variety.

Policy Implications

A preliminary analysis of frequency distributions shows that color, freshness, safety were important attributes influencing consumers' decisions to purchase fruits and vegetables. The U.S. food market is complex and dynamic and has experienced double-digit expansion in the last few decades. Consumers are demanding more attributes from the foods they consume. Understanding what consumers want will allow food marketers offer products that meet these demands, which will help improve sales revenues and profits for producers and lead to a vibrant U.S. food sector. Carefully targeting consumers and their demands could translate into money for producers and sellers of fruits and vegetables in Tennessee.

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