

Mid-Atlantic Consumer Purchasing Behavior and Knowledge of Locally Grown and Seasonal Produce

Abstract

Mid-Atlantic urban consumers were surveyed on their fruit and vegetable purchasing behaviors and their knowledge of produce grown in the region. Consumers were generally unaware of what produce is grown in the mid-Atlantic and during what months they are harvested. Additionally, differences pertaining to number of produce items purchased were exhibited based on demographic characteristics. Extension educators are advised of these trends as a basis to develop marketing and consumer educational efforts.

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Introduction

Consumer interest in locally grown produce has increased in recent decades, resulting in a 200% growth in the number of farmers' markets between 1994 and 2009 (USDA, 2009) and the number of Community Supported Agriculture (CSA) programs increasing to over 12,500 farms offering a program in 2007 (USDA, 2007). Though demand exists, many consumers are still unaware of where their produce originates (Ikerd, 2001), what types they can purchase from local/regional sources, and when these items are available. A study involving Pennsylvania high school students revealed that students were only able to correctly answer 58% of questions pertaining to food origin. Furthermore, only 40% could identify spring available produce, while 20% could identify fall available produce (Harmon, 1999). A similar survey conducted with New York University students indicated that the students were generally able to identify three local foods; however, potatoes, apples, and lettuce were among the foods that students listed as "not seasonal" to the local region (Wilkins, Bowdish, & Sobal 2000).

Although knowledge of locally grown produce may be lacking overall, certain consumer groups may have more knowledge than others if they purchase these items frequently. For example, a survey of

New Jersey consumers showed that the majority of those who were aware of a regional branding program for local produce also purchased products branded by this program (Govindasamy, Italia, & Thatch, 1999). Several other studies have also found that those who typically frequent farmers markets and other locally grown produce venues are usually highly educated, professional, medium-old aged, white, and female, and belong to households of two members and have higher levels of income or socioeconomic status (Govindasamy, Italia, & Adelaja, 2002; Wardle et al., 2004; Elepu, 2005; Kiefer, Rathmanner, & Kunze, 2005; Zenk et al., 2005; Dubowitz et al., 2008; Stewart & Lucier, 2009; Severson, 2010). Additionally, those who frequented these markets were very similar to those who purchased more produce items in general (Elepu, 2005).

Research is needed to understand primary food shopper knowledge of locally grown produce and seasonal availability. Once this is understood, Extension personnel can help develop and provide appropriate educational initiatives to consumers so as to better connect them to farms and markets selling locally grown produce. Specifically, examining primary food shoppers residing in the mid-Atlantic region is vital as it accounts for nearly 20% of the nation's population (U.S. Census Bureau, n.d.). The trend for purchasing locally grown produce also particularly affects this region due to the large number of small and part-time growers, as many of these farms may serve markets and consumers in their local areas. Past research has focused on subjects from this region only, yet thus far, studies conducted to examine consumer knowledge of locally grown produce have primarily included students. Further information is needed about the types of fruits and vegetables purchased, knowledge of produce origins, and how these relate to consumer demographics. Educational materials can then be better tailored to groups who actually seek and purchase these items.

Research Objectives

- Determine what fruits and vegetables consumers purchase that can be grown in the mid-Atlantic region.
- Determine what fruits and vegetables consumers believe are grown in the mid-Atlantic.
- Determine what months consumers believe that a selection of fruits and vegetables grown in the mid-Atlantic are harvested.
- Compare responses between demographic groups.

Methods

Data were collected through two separate 15-minute Internet surveys (Survey 1, 7-10 Apr. 2009, and Survey 2, 23-25 Mar. 2010) developed using SurveyMonkey (Palo Alto, CA). An average of 1,638 Survey Sampling International, LLC (Shelton, CT) panelists between the two surveys residing in five metropolitan areas in the mid-Atlantic U.S. region (Richmond, Washington, D.C., Philadelphia, Baltimore, and New York City) responded to the surveys. Surveys were pre-tested on a subset (N=100) of the target consumer population. Participants were randomly selected from a panel of participants residing in targeted metropolitan areas managed by Survey Sampling International, LLC. Panelists received an electronic consent statement along with a link to the survey developed by

researchers and approved by the Office of Research Protections at The Pennsylvania State University (University Park, PA). Panelists were screened for being at least 21 years old and also if they were the primary shopper for their household (as questions about alcohol were asked).

Survey data was analyzed with SPSS (versions 17, 18 and 19; SPSS, Chicago, IL). To assess differences between responses across demographic groups (Table 1), Pearson's Chi Square (X²) and Phi and Cramer's V tests were used to analyze responses for categorical and/or multiple-choice questions, Kruskal-Wallis and Mann-Whitney U tests for Likert-Scale questions, and the independent T-test and ANOVA tests for interval/ratio questions.

Results

Summary of Participant Demographics

As tests of significance between participant groups were only able to be conducted for Survey 1 participants, a summary of demographics for only this survey's participants are shown (Table 1).

Table 1.
Summary of Demographics for Survey 1 Participants

	No. (%)
Age Group	
21-24	95 (6)
25-36	237 (14)
37-48	404 (24)
49-64	800 (47)
>65	169 (10)
Household Income Level	
<\$25,000	246 (15)
\$25,000-\$49,999	490 (29)
\$50,000-\$74,999	411 (25)
\$75,000-\$99,999	226 (14)
>\$100,000	298 (18)
Ethnic Group^z	
White	1349 (82)
Black	210 (13)
Asian	40 (2)

Hispanic	42 (3)
Number of Adults In the Household	
1	410 (24)
2	819 (48)
3	287 (17)
4 or more	183 (11)
Gender	
Male	326 (19)
Female	1370 (81)
² White = White/Anglo, Black = Black/African American, Asian = Asian American, Hispanic = Hispanic American	

Purchasing Behavior and Knowledge of mid-Atlantic Fruits and Vegetables

To assess consumer knowledge and purchases of produce grown in the mid-Atlantic region, Survey 1 participants were first asked to indicate produce items they had purchased from a list of 32 fruits and vegetables commonly sold year-round at supermarkets (Table 2). Participants selected 22 types of produce on average, with apples purchased by most, followed by corn and tomatoes. The least popular items included eggplant and squash.

Table 2.
Survey 1 Consumer Perceptions Regarding Whether Certain Produce Items Are Grown in the Mid-Atlantic and Proportion Purchasing Each Item

Produce Item	Purchase Produce Item (%)	Belief That Produce Item is Grown In the Mid-Atlantic (%)	Produce Item	Purchase Produce Item (%)	Belief That Produce Item is Grown In the Mid-Atlantic (%)
Apples	91	73	Herbs	49	42
Asparagus	55	40	Leafy Greens	69	51

Beans	63	47	Melons	68	41
Berries	76	56	Mushrooms	62	45
Broccoli	78	52	Onions	79	51
Cabbage	60	49	Peaches	71	47
Carrots	81	57	Pears	64	37
Cauliflower	55	43	Peas	54	41
Celery	73	40	Peppers	72	52
Cherries	64	39	Plums	55	28
Corn	85	71	Potatoes	84	52
Cucumbers	78	62	Spinach	60	41
Eggplants	42	38	Squash	48	42
Garlic	61	28	Sweet Potatoes	60	37
Grapes	81	33	Tomatoes	84	69
Green Onions	55	43	Watermelons	74	49

To assess potential differences in purchasing behavior based on variety of items purchased, participants were segmented into two groups: those who purchased none to half of the produce items listed and those who purchased more than half or all 32 items. Responses were compared across a number of demographics. Statistically significant differences were found between age groups, ethnic groups, gender, number of adults in the household, and household income levels (Table 3).

Table 3.

Percentage of Survey 1 Consumers Purchasing Over Half (17 or More) of the 32 Produce Items Analyzed in the Study

Variable	Purchased 17-32 Items (%) ^{zy}				
	21-24	25-36	37-48	49-64	>65
Age Group	55c	67b	73ab	77a	76a
Income Level	<\$25,000	\$25,000- \$49,999	\$50,000- \$74,999	\$75,000- \$99,999	>\$100,000
	65b	70ab	75ab	81a	78a
Number of					

Adults In the Household	1	2	3	4 or More	
	65b	74a	79a	83a	
Ethnic Group^x	White	Black	Asian	Hispanic	
	75a	66b	73ab	62ab	
Gender	Male	Female			
	66b	75a			
<p>zPearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.</p> <p>yPercentages followed by common letters within rows and demographic categories are not significantly different</p> <p>xWhite = White/Anglo, Black = Black/African American, Asian = Asian American, Hispanic = Hispanic American</p>					

Variety of fruits and vegetables purchased increased with age. A statistically greater percentage of participants ages 49 and older purchased more than 75% of the produce items listed, compared to those between ages 21 and 36. A statistically greater percentage of participants with two or more adults in the household (across sub-categories) also purchased more than half of the produce items listed, compared to those with only one adult in the household. Those having household income levels \$75,000 and above (across sub-categories) were also statistically more likely to purchase than their counterparts with household income levels below \$25,000. Females also purchased a statistically greater variety of produce items than did males. Last, those describing themselves as White/Anglo as compared to Black/African American participants reported purchasing a greater variety of produce. (Table 3.)

Using the same list of 32 fruits and vegetables, participants were then asked to indicate which they believed were grown in the mid-Atlantic region (Table 2). The majority was able to correctly identify 11 of the 32 items as being grown in the region. Over 70% selected apples, corn, and tomatoes, while over half selected items such as berries and cucumbers. Items selected by less than half included garlic and cabbage. Unlike earlier comparisons made based on variety of mid-Atlantic grown produce purchased, no differences were detected between demographic groups pertaining to knowledge of which items were grown in the mid-Atlantic region.

Knowledge of When Fruits and Vegetables are Harvested in the Mid-Atlantic U.S. Region

Five produce items (tomatoes, lettuce, potatoes, apples, and grapes) were selected to assess consumer awareness of harvest and availability periods for these fruits and vegetables in Survey 2. Participants were asked to indicate the calendar months they believed the five items were harvested

from regional farms or whether they believed the item was not grown in the mid-Atlantic. With nine horticultural growing zones in this region (3b through 7b; USDA, 2003), the chosen fruits and vegetables have specific harvesting periods. Responses were deemed correct if participants selected month(s) when the item could be harvested from within in the mid-Atlantic, regardless of growing zone.

Only a slight majority of participants were able to correctly identify that apples can be harvested in Sept. and Oct. and that tomatoes are harvested in July and Aug. (Table 4). Less than half correctly identified the months during which lettuce, grapes, or potatoes are harvested in the region. Additionally, up to one-third of participants incorrectly selected that these five items were not grown in the mid-Atlantic.

Table 4.

Survey 2 Consumers' Perceptions of When Specific Various Fruits and Vegetables Are Harvested in the Mid-Atlantic Region

Month that Participants Indicated Each Fruit and Vegetable Was Harvested	Fruit/Vegetable (%) ^z				
	Apples	Grapes	Lettuce	Potatoes	Tomatoes
January	3	2	5*	3	2
February	5	2	5*	5	3
March	6	4	10*	8*	7
April	9	8	19*	11*	13
May	12	13	33*	16	25
June	15	21*	46*	23	45
July	17*	28*	42*	26*	62*
August	29*	32*	38*	34*	59*
September	59*	30*	28*	40*	41*
October	52*	14*	12*	29*	13*
November	22	3	4*	15*	3
December	5	1	2*	6*	2

^zPercentages with asterisks indicate a correct harvest month for that fruit/vegetable within the mid-Atlantic region.

Discussion

Data for the mid-Atlantic region suggest that while the majority of urban consumers purchase a variety of produce that can be grown in the mid-Atlantic, they are generally unaware that these

items are actually grown in the region. They are even less informed about harvest times, which can be an indication of when fresh produce is available for purchase locally. The majority of survey participants could only identify 11 out of the 32 types of produce on the provided list that are grown in the region. Results are representative of Harmon's 1999 study that found that Pennsylvania high school students scored an average 58% for correct responses to food origin questions. Our results suggest that most consumers are unaware as to when certain fruits and vegetables are harvested, with just over half able to identify two of the four months that tomatoes are harvested, and only two of the eight months that apples are harvested. Our results support those of a 2000 study (Wilkins, Bowdish, & Sobal), which found that New York University students identified produce, such as apples and potatoes, as non-seasonal goods, which may indicate a lack of knowledge of harvest times.

The fact that the majority of participants purchased most of the produce items presented that can be grown in the mid-Atlantic is encouraging for industry members who grow and/or sell these items locally. Consumers may be driven to purchase these items if they are informed of what can be grown and available for purchase in the mid-Atlantic and when these items are available. Past studies have shown that often the same consumers who purchase and eat more fruits and vegetables are similar to those who purchase locally grown produce. Individuals who reported purchasing a greater variety of produce in our study were also more likely to be older than 24 years, have a household income level \$50,000 to \$99,999, belong to a household of two or more adults, female, or describe themselves as White/Anglo.

These findings are supported by research showing that consumers who purchase more fruits and vegetables belong to older age groups, are female, have households of two members, and have a higher income level and/or socioeconomic status. (Govindasamy, Italia, & Adelaja, 2002; Wardle et al., 2004; Elepu, 2005; Kiefer, Rathmanner, & Kunze, 2005; Zenk et al., 2005; Dubowitz et al., 2008; Stewart & Lucier, 2009; and Severson, 2010.)

Extension personnel can use these data as a guide for developing educational materials to inform mid-Atlantic consumers about what produce can be grown locally and during what months of the year they are available fresh for purchase. A lack of knowledge may be preventing interested consumers from purchasing. Results of the study may also be shared with local producers in helping them develop promotional materials as a way of informing new and current consumers.

Future research should focus on examining consumer knowledge of local and seasonal produce within more rural areas of the mid-Atlantic region. These consumers may have more exposure to these items due to proximity to farms and/or have farming backgrounds. If rural consumers are indeed more knowledgeable of local and seasonal produce, efforts could be concentrated on educating urban consumers. Extension personnel looking to incorporate new educational initiatives should also take into account that consumers within different markets in the mid-Atlantic U.S. region will vary in their knowledge of, and purchasing behavior for, locally grown and seasonal produce.

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