The Pennsylvania State University

The Graduate School

College of Agricultural Sciences

URBAN CONSUMERS' PERSPECTIVES ON MARKET OPPORTUNITIES FOR MID-ATLANTIC SPECIALTY CROPS

A Thesis in

Horticulture

by

Amy J. Chamberlain

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science

May 2011

The thesis of Amy J. Chamberlain was reviewed and approved* by the following:

Kathleen M. Kelley
Associate Professor of Horticultural Marketing and Business Management
Thesis Co-Adviser

Jeffrey Hyde
Associate Professor of Agricultural Economics
Thesis Co-Adviser

Richard Marini
Professor of Horticulture
Committee Member
Head of the Department of Horticulture

*Signatures are on file in the Graduate School.

ABSTRACT

Consumer attitudes and behaviors pertaining to fresh produce and value-added processed products impact firms in the fruit and vegetable industries as they try to understand and meet demand. Recent market data show increased consumer demand for locally grown and/or certified organic produce and value-added processed products, as well as the desire for knowing where their food is sourced. This research was conducted to understand how important these trends are in the mid-Atlantic region. The methodology for this research included administering four Internet surveys to primary food shoppers, age 21 and older, residing in five metropolitan areas of the mid-Atlantic region (Richmond, VA; Baltimore, MD; Washington, D.C.; Philadelphia, PA; and New York City, NY) with the goal of examining their knowledge of, and attitudes and behavior towards fresh and value-added specialty crop products. These topics were investigated by examining purchasing behavior, including outlet of choice (e.g. farmers' market), and preferences for locally grown and certified organic produce. Additionally, consumers were tested on their knowledge and purchasing behavior of mid-Atlantic grown produce and state promotional programs. Results indicate a strong preference for locally grown produce and value-added processed products, with an average of 71% (across two surveys) of research participants reporting that they purchase locally grown produce. Consumers also exhibited preferences for certified organic produce, preferring both locally grown and certified organic produce over one or neither of these options. Additionally, while consumers indicated purchasing a variety of produce that can be grown within the mid-Atlantic region, the majority could not correctly identify what types of fruits and vegetables can be grown in this region and when these items are

harvested. Lastly, consumers as a whole exhibited low awareness of state promotional programs. However, the few that did indicate they were aware of these programs and purchased products branded with these programs showed preferences for these items over products not branded by state promotional programs. Results presented here indicate many opportunities for mid-Atlantic produce industry stakeholders. Knowing consumer demand and preferences for locally grown and certified organic produce can assist stakeholders with meeting this demand. Results can also help stakeholders with deciding what consumer segments to target and developing marketing materials that best appeal to consumers. As the results also indicate a general lack of awareness for mid-Atlantic produced specialty crops and value-added processed products, stakeholders may choose to incorporate educational efforts using the results as a guideline. Informing consumers interested in specialty crops and products about when and what is available to purchase within this region may encourage them to purchase.

TABLE OF CONTENTS

LIST OF TABLES

ACKNOWLEDGEMENTS

My sincere gratitude goes out to everyone who helped see this thesis to fruition. I greatly appreciate all the advice, support and efforts contributed over the past two years.

Thanks to the USDA Specialty Crops Research Initiative (NIFA Award Number 2008-51180-04891) for funding the research presented here. I am fortunate to have had the opportunity to investigate a variety of topics and participate in research experiences through their financial support.

I would also like to acknowledge my committee members, Drs. Kathleen Kelley, Jeffrey Hyde and Richard Marini; without their guidance, patience, and hard work this thesis could not have been possible. I especially want to thank Kathy for her continued support, input and encouragement. She was a most excellent advisor and teacher and I am obliged to have worked with her as a graduate student. Also thanks to Jeff for his support and providing much appreciated insight into the fine art of composition. Thanks so very much to all of you!

I am also very appreciative of the statistical advice provided by Dr. Edward Yoder. His input was incredibly helpful in sorting through the data and choosing the best approach to analysis.

Finally, I would like to acknowledge my grandfather and late grandmother. Their passion for gardening and farming was my inspiration for pursuing a Masters degree in horticulture. I am who I am today because of their teachings, and to them I dedicate this thesis.

CHAPTER 1.

INTRODUCTION

Consumer demand for specialty crops and value-added processed products has increased in recent years, with much of the attention focused around products marketed as locally grown and/or certified organic. Market data support this, with sales for locally grown produce predicted to reach $7 billion by 2012, up $3 billion from 2002 sales data (Duffy, n.d.), while sales of organic produce reached $9.5 billion in 2009 (Supermarket News, 2010). According to a survey conducted by the National Restaurant Association (Thorn, 2010) of over 1,500 U.S. chefs, locally grown produce, farm/estate-branded ingredients, locally produced wine and beer, and organic produce is among the top 20 restaurant trends chefs predict for 2011. To satisfy their demand for these items, consumers are seeking local venues such as farmers' markets and CSA (Community Supported Agriculture) farms to purchase these items (Duffy, n.d.).

Examining these trends as they pertain to consumers residing in major metropolitan areas within the mid-Atlantic was deemed especially important as there are many stakeholders within this region's fruit and vegetable industries that are affected by the above trends. Specifically, since they produce a wide variety of fruits and vegetables and serve diverse markets, medium, small, and part-time growers may be impacted by changing demand for locally grown produce and other specialty crops (Schepp, 2010). Unlike large-scale growers located in the mid-west and west coast, smaller-scale producers in the mid-Atlantic are more likely to serve consumer markets near their farms. Likewise, the region's processors may also experience a growing demand for value-added specialty value-added processed products, as in 2007 nearly three quarters of consumers residing in the Northeast spent more per week on these products than the other three regions of the U.S. (Tanner, 2007). Additionally, as the mid-Atlantic region

accounted for nearly one-fifth of the U.S. population in 2010 (U.S. Census Bureau, n.d.), exploring market trends within the region is necessary to help interested stakeholders meet consumer demand for specialty crops and value-added processed products. Stakeholders interested in this research may include, but are not limited to, specialty-crop producers, processors, packers, marketers, brokers, wholesalers and distributors, retailers, restaurants, extension personnel, and government agencies. Data can assist stakeholders by identifying consumer trends in attitudes and purchasing behavior relevant to fresh produce and value-added processed products. This allows industry members to better understand demand, what motivates purchasing, and segments of consumers who are more, or less, likely to purchase. Secondly, by examining consumer knowledge and attitudes regarding fresh produce and value-added processed products grown in the mid-Atlantic, stakeholders interested in public education and/or promotion of programs and markets supporting these products can learn about consumer awareness to best cater to consumer needs and wants.

The overall goal of this research was to gather detailed information about trends pertaining to the U.S. mid-Atlantic region specialty crop industry by investigating consumer demand pertaining to fresh fruits and vegetables and value-added processed products. Trends investigated included demand for locally grown and/or certified organic produce and value-added processed products, and subsequently, an examination of consumer knowledge of locally/regionally grown produce and programs supporting these products. Topics examined in these studies included consumer attitudes and purchasing behavior of value-added processed products labeled or marketed as "locally grown" and/or "certified organic," and knowledge of and purchasing behavior involving products

produced within the mid-Atlantic and/or programs and markets promoting the sale of these products.

To obtain a portrait of consumer demand for specialty crops and food products within the mid-Atlantic, surveys were administered to consumers residing within five major metropolitan areas of the region. For the purposes of this study, the mid-Atlantic region was defined as including New York, Pennsylvania, New Jersey, Delaware, Washington, D.C., Maryland, and Virginia as the majority of production areas within the mid-Atlantic region are bound by markets in Washington, D.C. and these six states. To gather data for analysis, four surveys were administered (17-19 Nov. 2008, 7-10 Apr. 2009, 16-19 Oct. 2009, and 23-25 Mar. 2010) to an average of 1,592 Survey Sampling International, LLC (Shelton, CT) panelists residing in Richmond, VA; Washington, D.C.; Philadelphia, PA; Baltimore, MD; and New York City, NY. 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). They were screened for being at least 21 years old (because questions about alcohol products and consumption were asked) and also if they were the primary shopper for their household. Those who elected to participate proceeded to the survey which was developed using SurveyMonkey.com (Palo Alto, CA), an online provider of survey solutions.

Survey data were analyzed with SPSS (versions 17, 18 and 19; SPSS, Chicago, IL). Pearson's Chi-Square (X^2), Kruskal-Wallis and Mann-Whitney U, and independent T-test and ANOVA tests were to assess differences between responses across demographic groups. As the Pearson Chi-Square test (X^2) is the most common test used

to determine significance of the relationship between categorical variables (StatSoft, 2011), it was used to discover any significant differences across demographic groups within responses to dichotomous and/or multiple-choice survey questions. The majority of the survey questions were structured as such, and the demographic groups were mostly categorical, hence, the Pearson Chi-Square test (X^2) was the most appropriate test for examining differences within responses. Responses to survey questions that used a Likert-Scale, for example respondent level of preference or agreement to a particular statement, were analyzed using Kruskal-Wallis and Mann-Whitney U tests. These tests were chosen as they are used to determine significant differences within ordinal data (Statisticslectures.com, 2011).

Research results are presented in Chapters Two through Five. Chapter Two highlights research examining consumer attitudes and beliefs pertaining to locally grown value-added processed products and the venues at which these products are purchased, namely, farmers' markets. Specifically, consumer definitions of "locally grown," purchasing behavior of locally grown produce and value-added processed products, and from what outlets these products are purchased were investigated. Chapter Three describes consumer preferences for locally grown and certified organic produce by comparing preferences for these items to produce that is not locally grown and produced conventionally. Preferences for locally grown and certified organic are also compared directly. Research investigating consumer knowledge and purchasing behavior of products grown within the mid-Atlantic region is detailed in Chapter Four, depicting the level to which consumers could identify produce grown in the mid-Atlantic region and the months that these items can be harvested in the region. Chapter Five includes research

that examined consumer awareness of state promotional programs within the mid-Atlantic and purchasing behavior and preferences towards products branded by these programs. Within the research outlined in these four chapters, statistically significant differences between consumer demographic groups are also discussed. Lastly, Chapter Six details the overall implications and conclusions of the research presented in this study. Also included are recommendations on how stakeholders within the mid-Atlantic region may utilize the results of this research to help meet consumer demand for specialty crops and food products and improve consumer marketing and educational efforts.

References

Duffy, M.P. n.d. Emerging markets. Retrieved from: <http://www.growingmagazine.com/article.php?id=5260>.

Schepp, 2010. Local food movement gives small farms a big boost. Daily Finance. Retrieved from: <http://www.dailyfinance.com/story/real-estate/local-food-movement-gives-small-farms-a-big-boost/19627166/>.

Statisticslectures.com. 2011. Tests for ordinal data. Retrieved from: <http://statisticslectures.com/ordinaltests.php>.

StatSoft. 2011. Basic statistics. Retrieved from: <http://www.statsoft.com/textbook/basic-statistics/?button=1>.

Supermarket News. 2010. Survey: U.S. organic product sales reach $26.6B in 2009. Retrieved from: <http://supermarketnews.com/news/organic_sales_0422/>.

Tanner. R. 2007. Today's specialty food consumer 2007. Specialty Food Magazine 37(9), 47-64.

Thorn, B. 2010 Chefs predict the biggest trends for 2011. Retrieved from: < http://www.nrn.com/article/chefs-predict-biggest-trends-2011?ad=food-and-beverage&utm_source=MagnetMail&utm_medium=email&utm_term=dfirst@globe.com

&utm_content=NRN-News-NRNam-12-2-

10&utm_campaign=Chefs%20predict%20the%20biggest%20trends%20for%202011>.

U.S. Census Bureau. (n.d.) 2010 Census Data. Retrieved from:

<http://2010.census.gov/2010census/data/>.

CHAPTER 2.

CONSUMER PURCHASING BEHAVIOR AND ATTITUDES TOWARDS LOCALLY GROWN PRODUCE AND VALUE-ADDED PROCESSED PRODUCTS IN THE MID-ATLANTIC

Summary

Four separate surveys were administered (17-19 Nov. 2008, 7-10 Apr. 2009, 16-19 Oct. 2009, and 23-25 Mar. 2010) to an average of 1,592 consumers residing in five metropolitan areas in the mid-Atlantic U.S. region to investigate purchasing behavior and attitudes towards locally grown produce and value-added processed products. Differences were explored between groups across a number of demographics, including metropolitan area of residence and age group. Results indicate a strong preference for locally grown produce and value-added processed products, with an average of 71% (across two surveys) of participants reporting that they purchase locally grown produce. Preference for these products was statistically significantly greater among particular consumer segments, including those residing in the Philadelphia metropolitan area and those belonging to older age groups (ages 37 and older). For example, 78% of Philadelphia metropolitan area residents indicated in Survey 1 that they purchased locally grown fruits and/or vegetables whenever possible, as compared to 63% to 68% of residents from the other four metropolitan areas. Likewise, 68% to 73% of participants ages 37 and older reported the same, as compared to 55% to 63% of participants between ages 21 and 36 (ranges reported reflect the percentages from several sub-categories of age within the broader groups discussed here). Results from this study can assist produce industry members (e.g. farmers, distributors, retail store owners, restaurateurs, agricultural extension personnel) to identify fruits, vegetables, and value-added processed products that appeal to consumers, types of products that should be offered to various types of consumers, and how to best market and attract consumers to these products.

Introduction

Nationally, demand for locally grown produce and value-added processed products has increased significantly in recent years. Sales are predicted to reach $7 billion by 2012, up $3 billion from 2002 (Duffy, n.d.). Research conducted by the USDA Agricultural Marketing Service supports this, describing consumers as "willing to go the extra mile to get these products," and seeking local venues such as farmers' markets and CSA (Community Supported Agriculture) programs from which to purchase locally grown produce and value-added processed products (Duffy, n.d.).

According to a survey conducted by the National Restaurant Association (Thorn, 2010) of over 1,500 U.S. chefs, "locally grown produce" is among the top 20 restaurant trends chefs predict for 2011. Additionally, there has been an increase in the number of venues selling locally grown value-added processed products, with a 7% increase in the number of U.S. farmers' markets between the years of 2006 to 2008 (Rathke, 2008). According to a national online survey (Bond et al., 2006), 3 out of 4 respondents reported shopping at a farmers' market during the period of 2005-2006 and nearly a third of respondents reported a preference for farmers' market as their source for seasonal produce. Some states have also supported the creation of state promotional programs such as New Jersey's "Jersey Fresh" brand and Pennsylvania's "PA Preferred," two programs which help to identify and promote the sale of produce and other value-added processed products that are grown and/or produced within the state (PA Preferred, 2011, State of New Jersey Department of Agriculture, 2011).

In addition to purchasing more locally grown products, consumers have also expressed a willingness to pay a premium for these goods (Bond et al., 2006; Darby et al.,

2006), citing the desire to improve their health and that of their families, the environment, and their local economies (The Hartman Group, 2007; Scott-Thomas, 2009). Consumers also reported that they enjoy meeting the people who produce their food and supporting local business due to feelings of "hometown pride," or home-bias (Darby et al., 2006). Additionally, the need for an authentic, high quality, and unique food experience was also identified to be of considerable importance (The Hartman Group, 2008). Lastly, consumers reported believing that fresh, locally grown produce contains higher levels of nutrients than conventionally produced foods shipped hundreds or thousands of miles (The Hartman Group, 2007). While the Leopold Center for Sustainable Agriculture found that in Iowa locally grown value-added processed products travel an average of 56 miles from farm to consumer, nationally, the average produce item travels over 1,500 miles before being purchased by the consumer (Hill, 2008). Although the reasons described above reflect consumer concerns on a national level, information about which consumer segments in the mid-Atlantic U.S. region are more likely to purchase locally grown produce and value-added processed products is not present in the current literature. Such information would benefit produce industry members in this region, such as growers, processors, restaurateurs, retailers, distributors, and marketers who grow, source, or sell such products.

Research Objectives

- To better understand consumer definitions of "locally grown"
- To examine purchasing behavior and intent to purchase locally grown produce and value-added processed products

- To examine specific venues at which consumers purchase locally grown produce and value-added processed products
- To examine how attitudes and behaviors may differ based on select consumer demographics (e.g., age groups, metropolitan area of residence, and ethnicity)

Materials and Methods

Data were collected through four separate 15 min Internet surveys (17-19 Nov. 2008, 7-10 Apr. 2009, 16-19 Oct. 2009, and 23-25 Mar. 2010) which were administered to an average of 1,592 Survey Sampling International, LLC (Shelton, CT) panelists residing in five metropolitan areas in the mid-Atlantic U.S. region (Richmond, VA; Baltimore, MD; Philadelphia, PA; Washington, D.C.; and New York City, NY). Surveys were pre-tested on a subset (n=100) of the target consumer. Participants were randomly selected from a specified 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 (as questions about alcohol products and consumption were asked) and also if they were the primary shopper for their household. Panelists were informed of these criteria in the consent statement before they proceeded to the survey.

Survey questions were developed based upon preliminary analysis of each preceding survey. Question topics focused on consumers' preference for locally grown produce and their food product purchasing behavior. General categories included

purchase of locally grown produce and value-added processed products, if these products were purchased at farmers' markets, retailers where purchases were made, why participants decided to purchase locally grown produce and value-added processed products, participant definitions of locally grown, and what would encourage participants to purchase produce at farmers' markets.

Data were analyzed with SPSS (versions 17 and 18; SPSS, Chicago, IL). To assess differences between responses segmented by demographic groups (Table 2.1), we used the Pearson's Chi Square and Phi and Cramer's V tests for categorical and/or multiple-choice questions, and the Kruskal-Wallis and Mann-Whitney tests for Likert-Scale questions.

Table 2.1. Summary of demographics for participants of all four surveys.

Responses (no.) and proportion (%) within each demographic group									
Variable	Survey 1	Survey 2	Survey 3	Survey 4	Variable	Survey 1	Survey 2	Survey 3	Survey 4
	No. (%)	No. (%)	No. (%)	No. (%)		No. (%)	No. (%)	No. (%)	No. (%)
Age Group					Metro area				
21-24	98 (6)	95 (6)	23 (2)	99 (7)	Richmond	128 (8)	121 (7)	131 (8)	115 (8)
25-36	281 (18)	237 (14)	202 (13)	165 (11)	Wash., D.C.	234 (15)	270 (16)	305 (20)	249 (16)
37-48	422 (27)	404 (24)	362 (23)	325 (22)	Philadelphia	318 (20)	481 (28)	390 (25)	298 (20)
49-64	619 (40)	800 (47)	746 (48)	694 (46)	Baltimore	165 (11)	182 (11)	210 (13)	193 (13)
≥65	142 (9)	169(10)	231 (15)	232 (15)	N.Y. City	720 (46)	656 (38)	531 (34)	663 (44)
Education Level[z]					Income Level				
HS	337 (22)	366 (22)	314 (20)	249 (17)	<$25,000	207 (13)	246 (15)	199 (13)	194 (13)
C/TS	438 (28)	517 (30)	405 (26)	404 (27)	$25,000-$49,999	421 (27)	490 (29)	416 (27)	401 (27)
TS/Assoc.	169 (11)	208(12)	177 (11)	162 (11)	$50,000-$74,999	332 (21)	411 (25)	342 (22)	309 (21)
Bachelors	393 (25)	370 (22)	408 (26)	450 (30)	$75,000-$99,999	261 (17)	226 (14)	250 (16)	272 (18)
MS+	221 (14)	237 (14)	252 (16)	246 (16)	≥$100,000	323 (21)	298 (18)	328 (21)	316 (21)
Ethnic Group[y]					Children[x]				
White/Anglo	1265 (81)	1349 (82)	1248 (81)	1211 (82)	Without Children	994 (64)	1140 (67)	1085 (70)	1085 (72)
Black/African	170 (11)	210(13)	222 (15)	177 (12)	With Children	558 (36)	555 (33)	467 (30)	420 (28)
Asian	41 (3)	40 (2)	27 (2)	50 (3)					
Hispanic	50 (3)	42 (3)	37 (2)	35 (2)					

[z]HS = Some high school or high school graduate, C/TS = some college or technical school, TS/Assoc. = technical school graduate or associates degree, Bachelors = bachelors degree, MS+ = masters degree or higher

[y]Black/African = Black/African American, Asian = Asian American, Hispanic = Hispanic American

[x]Children = Presence of Children in the Household

Results

Locally Grown Produce and Value-Added Processed Products Purchasing Behavior

A range of questions was asked in each survey to quantify local produce purchasing behavior. In both Surveys 1 and 2, the majority of participants (69% and 72%, respectively) indicated that, whenever possible, they purchased produce from the farmer who grew them or that were labeled locally grown. Additionally, an average of 76% of participants in Surveys 2 and 4 indicated that they purchased products directly from farmers' markets. Of those who reported purchasing at farmers' markets, an average of 70% (Surveys 3 and 4) also reported purchasing fresh fruits and vegetables at these markets. Only 10% of participants indicated that they were members of a Community Supported Agriculture (CSA) program, another potential source for locally grown produce and value-added processed products.

However, as the primary retailer they purchased from when locally grown produce is in-season, 60% of participants selected grocery store/supermarket, while only 29% reported the same for farmers' markets. The remaining 11% of participants selected specialty food stores, supercenters (e.g., Wal-mart), discounters (e.g., Dollar General), warehouses (e.g., Sam's Club), natural food stores, convenience stores/gas stations, and venues through the Internet, catalog and/or mail.

Comparisons Across Demographic Groups

Locally Grown Produce Purchasing Behavior

Age Group. Results indicate that the reported purchases of locally grown produce statistically differed by age group (Table 2.2). In Survey 1, a greater percentage of participants ages 37 and older (across sub-categories) were more likely to purchase locally grown produce than participants between ages 21 and 24. This was also true for those between ages 37 and 64 compared to those between ages 25 and 36 (across sub-categories). In Survey 2, similar responses were detected when participants were again asked about their purchasing behavior for locally grown produce, with a smaller percentage of participants between 21 and 24 indicating that they purchased locally grown compared to participants between ages 25 and 64 (across sub-categories).

Metropolitan Area. Purchasing behavior also statistically differed between metropolitan areas (Table 2.3). In Survey 1, a greater percentage of Philadelphia metropolitan area residents reported purchasing locally grown produce compared to Richmond, Washington, D.C., and New York metropolitan area residents. Responses to Survey 2 were similar, with a lower percentage of Washington, D.C. metropolitan area residents reporting purchasing locally grown produce compared to participants from all other metropolitan areas (Richmond, Philadelphia, Baltimore, and New York).

Table 2.2. The percentage of consumers, segmented by age group, who reported purchasing locally grown produce and purchasing products from farmers' markets in the mid-Atlantic U.S. region.

Variable	Age group				
	21-24	25-36	37-48	49-64	≥65
Purchases locally grown produce[zy]					
Survey 1 (%)	55c	63bc	73a	72a	68ab
Survey 2 (%)	56b	73a	73a	74a	65ab
Purchases products from farmers' markets					
Survey 2 (%)	71b	77b	81ab	84a	78ab
Survey 4 (%)	59b	60b	72a	73a	70ab

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Table 2.3. The percentage of consumers, segmented by metropolitan area of residence, who reported purchasing locally grown produce and purchasing products from farmers' markets in the mid-Atlantic U.S. region.

Variable	Metropolitan area of residence				
	Richmond	Wash., D.C.	Philadelphia	Baltimore	N.Y. City
Purchases locally grown produce[zy]					
Survey 1 (%)	67b	63b	78a	72ab	68b
Survey 2 (%)	74a	62b	74a	75a	73a
Purchases products from farmers' markets					
Survey 2 (%)	75b	72b	84a	77b	84a
Survey 4 (%)	65b	65b	76a	72ab	69b

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Education Level. Groups within different education levels also statistically differed in their behavior (Table 2.4). In Survey 1, participants with an associates or technical school degree were more likely to report purchasing locally grown produce compared to those with less education (some high school and high school graduate), and those with more education (bachelor's degree and a master's degree or higher). A higher percentage of those with some college or technical school were also more likely to purchase locally grown produce compared to those with a master's degree or higher.

In Survey 2, a higher percentage of individuals with an associates or technical school degree reported purchasing locally grown compared to individuals with some college or technical school education. Additionally, a lower percentage of individuals with a master's degree or higher reported purchasing locally grown compared to individuals with some high school education or being high school graduates and those with some college or technical school education.

Table 2.4. The percentage of consumers, segmented by education level, who reported purchasing locally grown produce in the mid-Atlantic U.S. region.

Variable	Education level				
	HS[x]	C/TS	TS/Assoc.	Bachelors	MS+
Purchases locally grown produce[zy]					
Survey 1 (%)	68bc	72ab	78a	67bc	63c
Survey 2 (%)	72ab	72b	79ac	72abc	65c

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.
[x]HS = Some high school or high school graduate, C/TS = some college or technical school, TS/Assoc. = technical school graduate or associates degree, Bachelors = bachelors degree, MS+ = masters degree or higher.

Ethnic Group. Lastly, analyses revealed statistically significant differences between ethnic groups (Table 2.5). A larger percentage of participants who described themselves as White/Anglo reported purchasing locally grown produce compared to those describing themselves as Black/African American and Hispanic American. In Survey 2, the differences between White/Anglo and Black/African American found in Survey 1 were repeated.

Table 2.5. The percentage of consumers, segmented by ethnic group, who reported purchasing locally grown produce in the mid-Atlantic U.S. region.

Variable	Ethnic Group			
	White/Anglo	Black/African[x]	Asian	Hispanic
Purchases locally grown produce[zy]				
Survey 1 (%)	72a	58b	63ab	52b
Survey 2 (%)	73a	64b	68ab	63ab

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.
[x]Black/African = Black/African American, Asian = Asian American, Hispanic = Hispanic American

Farmers' Market Product Purchasing Behavior

Age Group. Survey 2 results revealed that participants between ages 49 and 64 (Table 2.2) purchased products from farmers' markets at a significantly higher percentage compared to participants between ages 21 and 36 (across sub-categories). Responses to this question also asked in Survey 4 were similar to Survey 2 (Table 2.2). A significantly higher percentage of participants between ages 37 and 64 reported purchasing products from farmers' markets compared to participants between ages 21 and 36 (across sub-categories).

Metropolitan Area. This question in both Surveys 2 and 4 also yielded a similar trend in purchasing behavior among metropolitan areas (Table 2.3). In Survey 2, a statistically greater percentage of participants living in metropolitan Philadelphia and New York reported purchasing goods at farmers' markets compared to metropolitan Richmond, Washington, D.C., and Baltimore participants. As observed in Survey 2, Survey 4 Philadelphia metropolitan participants were more likely to purchase products from farmers' markets compared to their counterparts living in other metropolitan areas (Richmond, Washington, D.C., and New York City).

Farmers' Market Fresh Produce Purchasing Behavior

Metropolitan Area. To understand purchasing behavior towards fresh produce at farmers' markets, Survey 3 participants were asked if they purchased fresh fruits and vegetables from farmers' markets. More differences were detected between responses based on metropolitan area of residence (Table 2.6). In addition to locally grown produce, Philadelphia metropolitan participants were also statistically more likely to purchase produce from farmers' markets compared to participants from all other metropolitan areas.

Table 2.6. The percentage of consumers, segmented by ethnic group, who reported purchasing fresh fruits and vegetables from farmers' markets in the mid-Atlantic U.S. region.

Variable	Metropolitan area of residence				
	Richmond	Wash., D.C.	Philadelphia	Baltimore	N.Y. City
Purchases produce from farmers' markets[zy]					
Survey 3 (%)	61b	61b	72a	63b	61b

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Income Level. Results also showed that the higher the income level the statistically more likely participants were to purchase produce from farmers' markets (Table 2.7). Specifically, a higher percentage of participants with annual income levels of $50,000 or greater (across sub-categories) purchased produce from farmers' markets compared to participants reporting an income level of less than $25,000. Additionally, a greater percentage of participants with an income level of $100,000 or more reported purchasing produce from farmers' markets compared to participants earning $25,000 to $49,999.

Table 2.7. The percentage of consumers, segmented by income level, who reported purchasing fresh fruits and vegetables from farmers' markets in the mid-Atlantic U.S. region.

Variable	Income Level				
	<$25,000	$25,000-$49,999	$50,000-$74,999	$75,000-$99,999	≥$100,000
Purchases produce from farmers' markets[zy]					
Survey 3 (%)	55c	62bc	64ab	66ab	71a

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Farmers' Market Fresh Produce and Value-Added Processed Product Purchasing Behavior

Metropolitan Area. Survey 4 participants who indicated that they purchased products from farmers' markets were then asked to indicate their purchasing behavior for fresh produce and fruit and vegetable-based processed products (e.g. fruit jam, pickled vegetables). However, unlike responses in previous surveys, Philadelphia metropolitan area residents were not the most likely to purchase these products (Table 2.8). Instead, a significantly greater percentage of Washington, D.C. metropolitan participants reported purchasing fresh produce and produce-based products from farmers' markets as compared to metropolitan Richmond, Philadelphia, and New York participants. Also, a significantly greater percentage of metropolitan Baltimore participants reported purchasing these products compared to metropolitan Richmond participants.

Income Level. Income levels also had an effect on purchasing behavior. Analyses revealed that a significantly greater percentage of participants with annual income levels of at least $75,000 (across sub-categories) purchased produce and produce-based

products from farmers' markets than participants who reported annual income levels of less than $25,000 through $74,999 (across sub-categories) (Table 2.9).

Table 2.8. The percentage of farmers' market shoppers, segmented by metropolitan area of residence, who reported purchasing fresh fruits and vegetables and produce-based products from farmers' markets in the mid-Atlantic U.S. region.

Variable	Metropolitan area of residence				
	Richmond	Wash., D.C.	Philadelphia	Baltimore	N.Y. City
Purchased fresh produce and produce-based processed products from farmers' markets[zy]					
Survey 4 (%)	65c	83a	73bc	77ab	74bc

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Table 2.9. The percentage of farmers' market shoppers, segmented by income level, who reported purchasing fresh fruits and vegetables and produce-based products from farmers' markets in the mid-Atlantic U.S. region.

Variable	Income level				
	<$25,000	$25,000-$49,999	$50,000-$74,999	$75,000-$99,999	≥$100,000
Purchases fresh produce and produce-based processed products from farmers' markets[zy]					
Survey 4 (%)	71b	72b	70b	81a	80a

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Locally Grown Produce Purchasing Behavior When Produce Is In-Season

Survey 4 participants were asked to indicate where they primarily purchased fresh and vegetables when these produce are in-season (locally grown and available fresh). Responses were separated into two categories, the first being those who selected "farmers

market/CSA/on-farm market," 29% of participants, were categorized as buying directly from the farmer. All others comprised a second group (71%, those who selected other retailers, such as supermarkets, supercenters, natural food stores). Analyses again revealed significant differences between participants across age groups, metropolitan areas, and income levels.

Age Group. Older age groups again exhibited greater local purchasing behavior (Table 2.10). A significantly greater percentage of participants ages 37 and older (across sub-categories) selected farmer-direct compared to participants between ages 21 and 24. Percent responses for participants ages 49 and older (across sub-categories) were also significantly greater than participants between ages 25 and 36, as well as those between ages 49 and 64 compared to participants between ages 37 and 48.

Table 2.10. The percentage of consumers, segmented by age group, who reported purchasing produce from the farmer/grower when the produce was in-season (locally grown and available fresh) in the mid-Atlantic U.S. region.

Variable	Age group				
	21-24	25-36	37-48	49-64	≥65
Purchased produce from farmer/grower when produce was in-season[zy]					
Survey 4 (%)	14d	19cd	27bc	33a	33ab

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Metropolitan Area. Analyses based on metropolitan area of residence data (Table 2.11) showed that a statistically greater proportion of metropolitan Philadelphia residents selected that they primarily purchased fresh produce direct from the farmer compared to those residing in metropolitan Washington, D.C. and New York. Additionally, a

statistically lower percentage of metropolitan Washington, D.C. residents selected farmer-direct venues as their primary produce retailer compared to metropolitan Baltimore and New York residents.

Table 2.11. The percentage of consumers, segmented by metropolitan area of residence, who reported purchasing produce from the farmer/grower when the produce was in-season (locally grown and available fresh) in the mid-Atlantic U.S. region.

Variable	Metropolitan area of residence				
	Richmond	Wash., D.C.	Philadelphia	Baltimore	N.Y. City
Purchases produce from farmer/grower when produce was in-season[zy]					
Survey 4 (%)	27abc	22c	36a	34ab	28b

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Income Level. The trend in local purchasing behavior was again exhibited in participant level of income (Table 2.12) with lowest income participants being statistically least likely to select farmer-direct as their source of produce when locally grown produce is in season. Specifically, a lower percentage of participants with an annual income level of less than $25,000 selected farmer-direct compared to those with all other levels of income (across sub-categories).

Table 2.12. The percentage of consumers, segmented by income level, who reported purchasing produce from the farmer/grower when the produce was in-season (locally grown and available fresh) in the mid-Atlantic U.S. region.

Variable	Income level				
	<$25,000	$25,000-$49,999	$50,000-$74,999	$75,000-$99,999	≥$100,000
Purchases produce from farmer/grower when produce was in-season[zy]					
Survey 4 (%)	20b	31a	30a	30a	32a

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Consumer Attitudes and Opinions towards Locally Grown Produce and Value-Added Processed Products

In Survey 2, participants were asked to respond to questions pertaining to their perceptions of the term "locally grown" in both distance from their home (in miles) and in relative terms (e.g. own or neighbor's backyard, areas surrounding metropolitan area). The majority of participants defined "locally grown" as being grown within an area of 100 miles or less from their place of residence (78%), and 84% defined "locally grown" as being grown within their state (Table 2.13).

Table 2.13. Survey participant definitions of locally grown in both miles and relative distance from their residence in the mid-Atlantic U.S. Region.

Variable	No. (%)	Variable	No. (%)
0 to 15	199 (13)	Own or neighbor's backyard	112 (7)
16 to 25	253 (16)	Metropolitan area	297 (18)
26 to 50	436 (28)	Areas surrounding metropolitan area	567 (33)
51 to 100	334 (21)	State	439 (26)
101 to 150	108 (7)	Mid-Atlantic region	208 (12)
151 to 200	118 (8)	United States	65 (4)
200 to more	130 (8)	United States, Canada, or Mexico	8 (1)

Additionally, participants who indicated that they purchased locally grown produce (an average of 71% of participants across Surveys 1 and 2) were provided a list of reasons and were asked to identify which of these motivated them to purchase locally grown produce. This subset of participants, in Survey 1, agreed, on a Likert-Scale of 1 to 7 (1 = strongly disagree, 7 = strongly agree), that freshness, quality, and taste of produce were reasons for purchasing locally grown, with all mean ratings falling between "agree," 6.0, and "strongly agree," 7.0 (Table 2.14). In Survey 2, the list was extended to capture more reasons that consumers purchase locally grown produce. Survey 2 participants also agreed that freshness, quality, and taste were reasons for purchasing, in addition to safety of produce and supporting their local economy. Participants exhibited less concern with other reasons, such as availability of "certified" organic produce, and variety of produce available to purchase, as shown in Table 2.14.

Table 2.14. Average mean responses for participants, who reported purchasing locally grown produce during two separate Internet surveys, as to what motivated them to purchase produce that was locally grown.

Variable	Survey 1 (mean)	Survey 2 (mean)	Variable	Survey 2 (mean)
Produce freshness[z]	6.2	6.5	Supporting the farmer and the local economy[zy]	6.5
Produce quality	6.1	6.3	Loss of jobs in area if the number of farms decline	5.9
Produce taste	6.2	6.3	Concern for number of miles produce has traveled from where it is grown	5.6
Price of produce	5.6	5.9	Concern for how natural the produce is	5.8
Variety of produce available to purchase	5.3	5.5	Concern for sustainable growing practices	5.6
Access to produce regularly consumed in household	5.6	5.8		
Availability of "certified" organic produce	4.3	4.8		
Produce food safety	5.8	6.0		
Pesticide residue on produce	5.5	5.5		
The impact of pesticides and fertilizers on the environment	5.6	5.6		
Keeping land zoned as agricultural	5.8	5.9		

[z]7=strongly agree; 6=agree; 5=somewhat agree; 4=neither agree nor disagree; 3=somewhat disagree; 2=disagree; 1=strongly disagree

[y]No data exists for Survey 1 as question option was not included in the questionnaire

Also, participants in Survey 4 who indicated that they did not currently purchase produce or produce-based products from farmers' markets (25%) were asked to indicate what would motivate them to begin purchasing these goods at farmers' markets (Table 2.15). Half of these participants stated that they would make purchases if markets offered produce at lower prices, if they knew there was a farmers' market located in their area, and if the markets were in a more convenient location.

Table 2.15. Factors that might entice consumers who do not currently purchase produce or value-added processed products from farmers' market shoppers to start shopping at farmers' markets for these products.

Participant would start shopping for produce or value-added processed products at farmers markets if:	No. (%)
I knew that there was a farmers market located in my area.	329 (50)
I knew that the market was in a more accessible/convenient location.	319 (48)
The market offered a greater quantity of fruit and vegetable products.	136 (21)
The market offered better quality of fruit and vegetable products.	187 (28)
The market offered a greater variety of fruit and vegetable products.	142 (21)
The market offered fruit and vegetable products at lower prices.	332 (50)
The market was open during more convenient operating hours.	222 (34)
I was able to pay by debit or credit card instead of by only cash or check.	164 (25)
If the market was indoors rather than outdoors in instances of poor weather conditions (e.g., rain, snow, heat, cold).	140 (21)
If the market was currently open for this season/open year round.	186 (28)

Comparisons Across Demographic Groups

Motivations for Purchasing Locally Grown Produce

Age Group. In both Surveys 1 and 2, participants statistically differed in their motivations for purchasing locally grown produce across a number of demographic groups. Concerning differences among age groups, In Survey 1, those between ages 21 and 48 were significantly more likely to be concerned about availability of certified organic produce (Table 2.16), with mean ratings falling between "neither agree nor disagree," (4.0), and somewhat agree," (5.0), compared to participants 49 and older (across sub-categories). Participants age 49 and older expressed a statistically greater concern about keeping land zoned as agricultural compared to participants between ages 21 and 48 (across sub-categories).

Survey 2 revealed statistically significant results between age groups similar to those found in Survey 1. Participants belonging to younger groups, those between ages 21 and 24, were significantly more likely to express concern for availability of organic than participants identifying with all older age groups (across sub-categories).

Consumers ages 49 and older also expressed more concern for keeping land zoned as agricultural compared to younger participants (across sub-categories, as also seen in Survey 1 (Table 2.16). Additional results from Survey 2 indicated that participants 37 and older showed significantly greater concern for supporting the local economy than did younger age groups (across sub-categories). Pertaining to loss of jobs if the number of farms in the area declined (Table 2.5), those age 49 and older expressed a greater level of concern than participants between ages 21 and 48 (across sub-categories). These older groups of participants also expressed greater concern for the impact of pesticides and fertilizers on the environment compared to those and 25 and 48 (across sub-categories). Groups including ages 49 and older also showed greater concern about number of miles produce has traveled from where it was grown than participants between ages 21 and 24 and 37 and 48. Lastly, those between ages 49 and 64, and 37 and 48, differed on their level of concern for how sustainable the produce is when reporting why they decided to purchase locally grown.

Table 2.16. Factors affecting purchasing behavior of consumers, segmented by age group, who indicated that they purchased locally grown produce.

Variable	Age group				
	21-24	25-36	37-48	49-64	≥65
Availability of organic[zyx]					
Survey 1 (mean)	4.7a	4.6a	4.4a	4.2b	3.9b
Survey 2 (mean)	5.6a	4.9b	4.8bc	4.7c	4.5c
Keeping land zoned as agricultural					
Survey 1 (mean)	5.3b	5.6b	5.7b	5.9a	5.9a
Survey 2 (mean)	5.7bcd	5.5d	5.7cd	6.0ab	6.2a
Loss of jobs in my area if the number of farms declined					
Survey 2 (mean)	5.5b	5.7b	5.8b	6.0a	6.1a
Supporting the local economy					
Survey 2 (mean)	6.0b	6.2b	6.5a	6.6a	6.7a
Impact of pesticides and fertilizers on environment					
Survey 2 (mean)	5.5b	5.4b	5.5b	5.7a	5.8a
Number of miles produce has traveled from where it was grown					
Survey 2 (mean)	5.3b	5.6ab	5.5b	5.7a	5.9a
How sustainable the produce is					
Survey 2 (mean)	5.7ab	5.5ab	5.4b	5.7a	5.6ab

[z]The Mann-Whitney U test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Means followed by common letters within rows and demographic categories are not significantly different.
[x]7=strongly agree; 6=agree; 5=somewhat agree; 4=neither agree nor disagree; 3=somewhat disagree; 2=disagree; 1=strongly disagree

Metropolitan Area. Survey 1 participants located in metropolitan Philadelphia showed statistically greater concern for a number of reasons to purchase locally grown produce compared to residents of other metropolitan areas (Table 2.17). Specifically, they exhibited greater concern over the variety of produce available and access to produce regularly consumed in the household compared to Richmond and Baltimore. Additionally, metropolitan Philadelphia participants showed greater concern for safety of produce compared to participants from metropolitan Richmond, Washington, D.C., and New York City. The impact of pesticides and fertilizers on the environment and the availability of organic produce were also of greater concern compared to concerns of those from metropolitan Richmond and Baltimore participants. Lastly, Philadelphia

metropolitan residents expressed greater concern for keeping land zoned as agricultural compared to participants from Richmond, Washington, D.C., and Baltimore metropolitan areas.

Contrary to results based on metropolitan area of residence for Survey 1, participants responding to Survey 2 and who resided in metropolitan Philadelphia expressed statistically less concern for certain variables compared to participants residing in other metropolitan areas (Table 2.17). Specifically, metropolitan Philadelphia residents were less concerned about how natural the produce was compared to metropolitan Richmond and New York participants. Compared to the level of concern among metropolitan New York City participants, Philadelphia metropolitan residents were also less concerned for the availability of organic, pesticide residue on produce, loss of jobs if the number of area farms declined, and number of miles produce has traveled from where it was grown.

Table 2.17. Factors affecting purchasing behavior of consumers, segmented by metropolitan area of residence, who indicated that they purchased locally grown produce.

Variable	Metropolitan area of residence				
	Richmond	Wash., D.C.	Philadelphia	Baltimore	N.Y. City
Produce variety[zyx]					
Survey 1 (mean)	5.0b	5.3ab	5.4a	5.1b	5.4
Access to produce normally consumed in household					
Survey 1 (mean)	5.5b	5.5ab	5.8a	5.3b	5.7ab
Produce safety					
Survey 1 (mean)	5.7b	5.7b	6.0a	5.7ab	5.7b
Impact of pesticides and fertilizers on the environment					
Survey 1 (mean)	5.4b	5.6ab	5.8a	5.3b	5.6ab
Availability of "certified" organic produce					
Survey 1 (mean)	3.9c	4.3bc	4.5a	4.1c	4.4abc
Survey 2 (mean)	4.8ab	4.8ab	4.6b	4.7ab	4.9a
Keeping land zoned as agricultural					
Survey 1 (mean)	5.6b	5.6b	6.0a	5.7b	5.7b
Survey 2 (mean)	5.8a	5.7a	5.9a	5.9a	5.9a
Loss of jobs in my area if the number of farms declined					
Survey 2 (mean)	6.0ab	5.7b	5.8b	5.9ab	5.9a
How natural the produce is					
Survey 2 (mean)	5.9a	5.8ab	5.7b	5.8ab	5.9a
Pesticide residue on produce					
Survey 2 (mean)	5.7ab	5.4ab	5.3b	5.6ab	5.7a
Concern over the number of miles produce has traveled from where it is grown					
Survey 2 (mean)	5.8ab	5.5ab	5.5b	5.5ab	5.7a

[z]The Mann-Whitney U test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Means followed by common letters within rows and demographic categories are not significantly different.
[x]7=strongly agree; 6=agree; 5=somewhat agree; 4=neither agree nor disagree; 3=somewhat disagree; 2=disagree; 1=strongly disagree

Ethnic Group. When data were segmented based on ethnic groups (Table 2.18), in Survey 1, those describing themselves as White/Anglo showed statistically significantly less concern compared to those describing themselves as Black/African American for the price of produce, produce safety, pesticide residue on produce, and the impact of pesticides and fertilizers on the environment. White/Anglo participants also displayed

less concern for access to products regularly consumed in the household than did those describing themselves as Asian American. Concern for variety of produce was also significantly lower among White/Anglo participants than Black/African Americans and Asian Americans. Concern for the availability of organic was also lower compared to all other ethnic groups when reporting why they chose to purchase locally grown.

Regarding responses for Survey 2, participants describing themselves as White/Anglo again expressed statistically less concern for the availability of organic compared to participants from all other ethnic groups. However, White/Anglo participants showed statistically greater concern for keeping land zoned as agricultural compared to Black/African American participants and supporting the local economy compared to participants from all other ethnic groups.

Table 2.18. Factors affecting purchasing behavior of consumers, segmented by ethnic group, who indicated that they purchased locally grown produce.

Variable	Ethnic Group			
	White/Anglo	Black/African[w]	Asian	Hispanic
Produce variety[zyx]				
Survey 1 (mean)	5.3b	5.7a	5.9a	5.5ab
Access to produce normally consumed in household				
Survey 1 (mean)	5.6b	5.7ab	6.3a	5.6ab
Produce safety				
Survey 1 (mean)	5.7b	6.2a	6.1ab	5.9ab
Impact of pesticides and fertilizers on the environment				
Survey 1 (mean)	5.5b	5.9a	5.9ab	5.5ab
Price of produce				
Survey 1 (mean)	5.6b	6.0a	5.9ab	5.7ab
Pesticide residue on produce				
Survey 1 (mean)	5.5b	6.0a	5.5ab	5.3b
Availability of "certified" organic produce				
Survey 1 (mean)	4.2b	5.0a	5.5a	5.4a
Survey 2 (mean)	4.7b	5.2a	5.6a	5.7a
Keeping land zoned as agricultural				
Survey 2 (mean)	5.9a	5.4b	5.8	5.6
Supporting the farmer and the local economy				
Survey 2 (mean)	6.6a	6.2b	6.0b	6.2b

[z]The Mann-Whitney U test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Means followed by common letters within rows and demographic categories are not significantly different.
[x]7=strongly agree; 6=agree; 5=somewhat agree; 4=neither agree nor disagree; 3=somewhat disagree; 2=disagree; 1=strongly disagree
[w]Black/African = Black/African American, Asian = Asian American, Hispanic = Hispanic American

Presence of Children in Household. Individuals with and without children also statistically differed in their reasons for purchasing locally grown produce (Table 2.19). In Survey 1, participants with children expressed a greater concern for price of produce than those residing in households without children. Participants with children were more concerned about availability of organic and produce safety compared to their counterparts without children.

Lastly, as in Survey 1, Survey 2 participants with children expressed statistically greater concern for the availability of organic compared to those with no children. In

addition, a statistically greater level of concern was also expressed among individuals without children for keeping land zoned as agricultural and supporting the local economy.

Table 2.19. Factors affecting purchasing behavior of consumers, segmented by presence of children in household, who indicated that they purchased locally grown produce.

Variable	Presence of children in the household	
	Without children	With children
Produce safety[zyx]		
Survey 1 (mean)	5.7b	5.9a
Price of produce		
Survey 1 (mean)	5.6b	5.8a
Availability of "certified" organic produce		
Survey 1 (mean)	4.2b	4.5a
Survey 2 (mean)	4.7b	4.9a
Keeping land zoned as agricultural		
Survey 2 (mean)	5.9a	5.7b
Supporting the farmer and the local economy		
Survey 2 (mean)	6.5a	6.4b

[z]The Mann-Whitney U test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Means followed by common letters within rows and demographic categories are not significantly different.
[x]7=strongly agree; 6=agree; 5=somewhat agree; 4=neither agree nor disagree; 3=somewhat disagree; 2=disagree; 1=strongly disagree

Discussion

Locally Grown Produce and Value-Added Processed Product Purchasing Behavior

Results provide insight into the prevalence of locally grown produce and food product purchases among consumers in the mid-Atlantic U.S. region. A majority of mid-Atlantic U.S. region survey participants (71%, averaged across Surveys 1 and 2) reported that they purchased locally grown produce at farmers' markets, with one in three participants reporting that farmers' markets were their primary source of fresh produce

when locally grown produce was in-season. These data support those of Darby et al. (2006) where nearly one third of respondents indicated a preference for farmers' markets as a seasonal source of produce. Locally grown and farmers' market purchasing behavior were highest among the following participant groups (independently of each group): participants who resided in metropolitan Philadelphia area, those age 49 and older, those who described themselves as White/Anglo, participants with higher income levels ($50,000 or greater) and those who completed some post high school education. These findings correspond with National Association for Specialty Food Trade (NASFT) data where farmers' markets were most popular among older consumers (NASFT, 2010). Past research also showed that consumers with higher household income levels were more likely to purchase locally produced agricultural products, while those with higher education levels were not (Jekanowski et. al., 2000).

Consumer Attitudes and Opinions Towards Locally Grown Produce and Value-Added Processed Products

Results primarily translate into a greater understanding of how mid-Atlantic U.S. region consumers define "locally grown," and why they chose to purchase locally grown foods. Generally, producers consider "local" to refer to food produced within a 100 mile radius of the consumer (The Food Institute & The Hartman Group, 2008), and results reported in this paper indicate that over three-quarters of mid-Atlantic U.S. region consumers also defined "local" as being grown within a 100 miles of their residence. Retailers interested in serving consumers who purchase locally grown products may find that using these descriptors in promotional materials and other marketing messages may

appeal to consumers as these phrases fall within boundaries defined by consumers.

Top concerns for consumers who purchase locally grown produce were freshness, taste, and quality. Participants who indicated that they did not purchase fresh produce from farmers' markets selected that they would start shopping at farmers' markets for produce if the markets had more convenient hours, lower prices, were in more convenient locations, and if they knew a market was located in their area. Such findings provide produce industry members with guidance as to key words that could be used to emphasize traits of produce in retail marketing efforts. Industry members could utilize these terms in promotional campaigns and on store signage to attract consumers who may not purchase locally grown produce in an effort to expand their consumer base. Additionally, farmers' market vendors could extend their hours of operation, into either evening or weekend hours, to provide potential customers with greater convenience. Marketing efforts, such as the distribution of flyers to various retail outlets or the utilization of social networking sites, could also be employed to increase consumer awareness of farmers' markets in their local area, while directions to the market or parking areas could be publicized through a greater number of outlets to decrease consumer barriers to attending these markets.

Participant groups highest in the reporting of purchasing locally grown produce and who showed the greatest concern for issues that focused more on the local area or economy were (independently of each group): metropolitan Philadelphia, groups including ages 37 and older, and the ethnic group, White/Anglo. Industry members growing or selling locally grown value-added processed products can take these concerns into account when deciding what consumer demographics to target when devising

marketing strategies. For example, vendors selling locally grown produce or value-added processed products should indicate the farm and town from where the produce/products originated to support consumer feelings for a local connection to the products they purchase.

Overall, data for the mid-Atlantic U.S. region suggest a strong desire among metropolitan consumers for locally grown value-added processed products with a large proportion of them turning to local venues, such as farmers' markets, to purchase fresh produce and other value-added processed products. Industry members looking to incorporate new strategies should also take into account that not all consumers will respond in the same manner, and that even consumers within different markets in the mid-Atlantic U.S. region will vary in their demands and motivations for purchasing locally grown value-added processed products.

References

Bond, J.K., Thilmany, D., and C.A. Bond. 2006. Direct marking of fresh produce: Understanding consumer purchasing decisions. Retrieved from: <http://www.choicesmagazine.org/2006-4/produce/2006-4-06.htm>.

Darby, K., Batte, M.T., Ernst, S., and B. Roe. 2006. Willingness to pay for locally produced foods: a customer intercept study of direct market and grocery store shoppers. Retrieved from: <http://ageconsearch.umn.edu/bitstream/21336/1/sp06da03.pdf>.

Duffy, M.P. n.d. Emerging markets. Retrieved from: <http://www.growingmagazine.com/arrticle.php?id=5260>.

The Food Institute & The Harman Group. 2008. What buying local means to consumers: a webinar from the Food Institute and the Hartman Group. Retrieved from:. <http://www.foodinstitute.com/buyinglocal.cfm>.

The Hartman Group. 2007. What makes local special? Retrieved from:. <http://www.hartmangroup.com/hartbeat/2007-01-24>.

The Hartman Group. 2008. Consumer understanding of buying local. Retrieved from: <http://www.hartman-group.com/hartbeat/2008-02-27>.

Hill, H. 2008. Food miles: background and marketing. Retrieved from: <http://www.attra.org/attra-pub/foodmiles.html>.

Jekanowski, M., Williams, D., and W. Schiek. 2000. Consumers' willingness to purchase locally produced agricultural products: An analysis of an Indiana survey. Retrieved from: <http://ageconsearch.umn.edu/bitstream/31329/1/29010043.pdf>.

National Association of Specialty Food Trade. 2010. Industry statistics. Retrieved from:<http://specialtyfood.com/knowledge-center/industry-info/industry-statistics/>.

PA Preferred. 2011. Retrieved from: <http://papreferred.com>.

Rathke, L. 2008. Growers cherry as winter farmers' markets swell. Retrieved from: <http://seattletimes.nwsource.com/html/businesstechnicalnology/2008572209_apfarmscenewintermarkets.html>.

Scott-Thomas, C. 2009. Organic foods are now 'mainstream,' says USDA. Retrieved from: <http://www.foodnavigator-usa.com/Product-Categories/Cereals-and-bakery-preparations/Organic-foods-are-now-mainstream-says-USDA>.

State of New Jersey Department of Agriculture. 2011. Retrieved from: <http://www.state.nj.us/agriculture/divisions/md/prog/jerseyfresh.html>.

Thorn, B. 2010. Chefs predict the biggest trends for 2011. Retrieved from: < http://www.nrn.com/article/chefs-predict-biggest-trends-2011?ad=food-and-beverage&utm_source=MagnetMail&utm_medium=email&utm_term=dfirst@globe.com &utm_content=NRN-News-NRNam-12-2-10&utm_campaign=Chefs%20predict%20the%20biggest%20trends%20for%202011>.

CHAPTER 3.

COMPARING CONSUMER PREFERENCES FOR LOCALLY GROWN AND CERTIFIED ORGANIC PRODUCE IN THE MID-ATLANTIC REGION

Summary

Two separate surveys were administered (17-19 Nov. 2008 and 7-10 Apr. 2009) to an average of 1,614 consumers residing in five metropolitan areas in the mid-Atlantic U.S. region to investigate and compare consumer preferences towards locally grown and certified organic produce. In Survey 1, participants were asked to indicate whether or not they agreed that purchasing locally grown produce was more important than purchasing organically grown produce. Additionally, they were asked to report whether or not locally grown and certified organic were factors in their produce purchasing decision. Compared to their counterparts (each demographic examined independently), White/Anglos, Asian Americans, and those age 25 and older agreed that purchasing locally grown produce was more important than purchasing organically grown produce. A greater percentage of participants ages 37 and older (range of 63% to 67%, across sub-categories) and 66% of White/Anglo participants selected "produce was grown in my local area." Additionally, a greater percentage of participants between ages 21 and 64 (range of 25% to 38%, across sub-categories) and 48% of Asian Americans selected "produce was grown using "certified" organic methods," compared to their counterparts.

In Survey 2, participants were presented with six pair-wise comparisons and asked to indicate their preference between each of the two options, which included combinations of "locally grown," "not locally grown," "certified organic," and "not certified organic." Preference for locally grown produce was highest among the following participant groups (each group examined independently): those ages 37 and older, White/Anglo participants, those without children living in their household, females, and participants with income levels $25,000 and greater. Additionally,

preference for certified organic was highest among the following groups (again, each group examined independently): those between ages 21 to 36, Black/African Americans, Asian Americans, and Hispanic Americans, those with children living in their household, females, and participants with income levels of $25,000 and greater. Produce industry members in the mid-Atlantic U.S. region (e.g. farmers, distributors, retail store owners, restauranteurs, agricultural extension personnel) can incorporate this research into marketing plans, purchasing decisions, or educational or applied research programs as appropriate.

Introduction

Consumer interest in purchasing locally grown and certified organic produce has remained strong, with locally grown and organic produce among the top 2011 trends in food service (Thorn, 2010). Market data support this, with sales for locally grown produce predicted to reach $7 billion by 2012, up $3 billion from 2002 sales data (Duffy, n.d.), while sales of organic produce reached $9.5 billion in 2009 (Supermarket News, 2010).

In addition to increased frequency of purchase, consumers have also expressed a willingness to pay a premium for locally grown (Bond et al., 2006; Darby et al., 2006) and certified-organic products (Bean, 2008; ScienceDaily, 2009; Scott-Thomas, 2009). A regional study reported similar results, with 59% of respondents participating in an Ohio survey stating that they would pay 10% or more for locally grown foods, while 39% of respondents reported the same willingness to pay a premium for organic (Anonymous, 2005).

Respondents were willing to pay a premium for locally grown produce because they desired to improve their health and that of their families, the environment, and their local economies (The Hartman Group, 2007; Scott-Thomas, 2009). In addition, common reasons for purchasing certified organic foods included animal welfare concerns (Scott-Thomas, 2009) as well as food safety, taste, and interest in new foods (Dettmann and Dimitri, 2010). Lastly, those seeking produce that is locally grown and/or certified organic did so to gain an authentic, high quality, and unique food experience (The Hartman Group, 2008).

To improve marketing strategies of locally grown and/or certified organic and promote local farmers and food businesses, researchers and those in the produce industry have expressed interest in quantifying consumer purchasing behavior and attitudes towards locally grown and certified organic value-added processed products (Rutberg, 2008; Berlin et. al, 2009; ScienceDaily, 2009). There have been several studies conducted that show consumers prefer locally produced foods over those that are certified-organic produce. In one study, 48% of consumers gave a favorable response to locally grown, while 26% gave the same response to certified organic (Supermarket News, 2008). This relative preference for locally grown over certified organic products was also found in research conducted in New England (Berlin et. al., 2009), Colorado (Loureiro and Hine, 2002), and Minnesota (ScienceDaily, 2009).

Other studies indicated that consumers equally preferred local and organic. In the Minnesota study described above, although consumers exhibited a preference for locally grown over certified organic products, their willingness to pay for organic produce was about the same as for locally grown produce. Additionally, a national survey indicated

that 44% of consumers reported being equally attracted to locally grown and organic products (Rutberg, 2008). Another national survey indicated that those consumers who had a preference were equally split between locally grown and certified organic products (Progressive Grocer, 2007).

Research also indicates that these preferences may vary between demographic groups. Studies examining these preferences separately found that older consumers were most likely to prefer and/or purchase locally grown products (Bean, 2008) as well as females and individuals with higher household income levels (Jekanowski et. al, 2000). Additionally, consumers with families (Organic Trade Association, 2009), Black/African American, Asian and Hispanic Americans (Dettmann and Dimitri, 2010; The Hartman Group, 2006), consumers with higher income levels, and younger consumers (Dimitri and Oberholtzer, 2009) were most likely to purchase organic products. However, the study by Bean (2008) showed that older consumers, not younger, were the most supportive of certified organic food, and also that female consumers were not the most supportive. Additionally, other research shows that race, presence of children in the household, and income level, do not have a consistent effect on the likelihood of buying organic food products (Dimitri and Oberholtzer, 2009).

The current literature reveals comparisons of locally grown produce and/or products to those that are certified organic but none make comparisons among those products that are both (neither) certified organic and (nor) locally grown. This creates four groups of products to analyze; both locally grown and certified organic, neither locally grown nor certified organic, locally grown only, and certified organic only. Information detailing relative preferences for locally grown and certified organic produce

among consumers in the U.S. mid-Atlantic region would benefit produce industry members in this region who grow, source, or sell locally grown and/or certified organic produce. Determining if consumers differ on preferences based upon demographics groups would also be helpful in developing strategies for marketing these types of produce to specific segments.

Research Objectives

- Determine if locally grown and certified organic are decision factors for purchasing produce
- Compare preferences for produce that is either:
  - a) locally grown, b) certified organic, c) both locally grown and certified organic, or d) neither locally grown nor certified organic
- Determine any potential differences across consumer demographic groups

Materials and Methods

Data were collected through two separate 15 min. Internet surveys (17-19 Nov. 2008 and 7-10 Apr. 2009) developed using SurveyMonkey (Palo Alto, CA) and administered to consumers (1,710 for Survey 1 and 1,518 for Survey 2) residing in five metropolitan areas in the mid-Atlantic U.S. region (Richmond, Baltimore, Washington, D.C., New York City, and Philadelphia). Surveys were pre-tested on a subset (N=100) of the target consumer population. Participants were randomly selected from a specified panel of participants in targeted metropolitan areas managed by Survey Sampling International, LLC (Shelton, CT), a provider of sampling solutions for survey research.

Panelists received an electronic consent statement along with a link to the survey 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 (as questions about alcohol products and consumption were asked) and also if they were the primary food shopper for their household.

Survey data were analyzed with SPSS (versions 17, 18 and 19; SPSS, Chicago, IL). To assess differences between responses across demographic groups (Table 3.1), Pearson's Chi Square (X^2) and Phi and Cramer's V tests were used to analyze responses for categorical and/or multiple-choice questions, and Kruskal-Wallis and Mann-Whitney U tests for Likert-Scale questions.

Table 3.1. Summary of demographics for Survey 1 and 2 participants.

Responses (no.) and proportion (%) within each demographic					
Variable	Survey 1	Survey 2	Variable	Survey 1	Survey 2
Age Group	No. (%)	No. (%)	Income Level	No. (%)	No. (%)
21-24	98 (6)	95 (6)	<$25,000	207 (130	246 (15)
25-36	281 (18)	237 (14)	$25,000-$49,999	421 (27)	490 (29)
37-48	422 (27)	404 (24)	$50,000-$74,999	332 (21)	411 (25)
49-64	619 (40)	800 (47)	$75,000-$99,999	261 (17)	226 (140
≥65	142 (9)	169 (10)	≥$100,000	323 (21)	298 (18)
Gender			Ethnic Group		
Male	312 (20)	326 (19)	White/Anglo	1265 (81)	1349 (82)
Female	1241 (80)	1370 (81)	Black/African American	170 (11)	210 (13)
Presence of Children in Household			Asian American	41 (3)	40 (2)
Without Children	994 (64)	1140 (67)	Hispanic American	50 (3)	42 (3)
With Children	558 (36)	555 (33)			

Results

Importance of Purchasing Locally Grown or Certified Organic Produce

In Survey 1, participants were asked to indicate, on a Likert-Scale from 1 (strongly disagree) to 7 (strongly agree) their level of agreement with the following statement: "Purchasing locally grown fruits and/or vegetables is more important than purchasing certified organic fruits and/or vegetables." Average response for participants, overall, was a mean rating of 5.2, falling between "somewhat agree," 5.0, and "agree" 6.0. Analyses of responses segmented by demographic groups (e.g., age group, metropolitan area of residence, gender) indicated significant differences within age and ethnic groups.

Comparisons Across Demographic Groups

Concerning participant age, mean response for those between ages 21 and 24 to the question "purchasing locally grown produce was more important than purchasing certified organic," was significantly lower than responses of all other age groups (Table 3.2). Additionally, participants describing themselves as White/Anglo and Asian American exhibited significantly higher mean responses than those describing themselves as Black/African American and Hispanic American (Table 3.3).

Table 3.2. Preferences for locally grown and/or certified organic produce segmented by age group.

Variable	Age group				
	21-24	25-36	37-48	49-64	≥65
Purchasing locally grown produce is more important than purchasing certified organic produce (mean)[zyx]	4.8b	5.2a	5.3a	5.2a	5.3a
Factors considered when purchasing produce (%)					
Locally Grown	47c	57bc	63ab	67a	64ab
Certified Organic	38a	39a	25b	26b	14c

[z]The Mann-Whitney U test and Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Means and percentages followed by common letters within rows and demographic categories are not significantly different.
[x]7=strongly agree; 6=agree; 5=somewhat agree; 4=neither agree nor disagree; 3=somewhat disagree; 2=disagree; 1=strongly disagree

Table 3.3. Preferences for locally grown and/or certified organic produce segmented by ethnic group.

Variable	Ethnic Group			
	White[w]	Black/African	Asian	Hispanic
Purchasing locally grown is more important than purchasing certified organic produce (mean) [zyx]	5.3a	4.9b	5.5a	4.8b
Factors considered when purchasing produce (%)				
Locally Grown	66a	48b	43b	41b
Certified Organic	26b	31ab	48a	39ab

[z]The Mann-Whitney U test and Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Means and percentages followed by common letters within rows and demographic categories are not significantly different.
[x]7=strongly agree; 6=agree; 5=somewhat agree; 4=neither agree nor disagree; 3=somewhat disagree; 2=disagree; 1=strongly disagree
[w]White=White/Anglo, Black=Black/African American, Asian=Asian American, Hispanic=Hispanic American

Local and Organic as Factors for Purchasing Produce

In Survey 1, participants were asked to indicate which factors influenced them when choosing and purchasing produce for the household (they were able to select as many as were applicable from a list). Sixty-three percent of participants selected "produce was grown in my local area," while only 28% selected "produce was grown using "certified" organic methods." Again, statistically significant differences were observed between age (Table 3.2) and ethnic groups (Table 3.3).

Comparisons Across Demographic Groups

A greater percentage of participants ages 37 and older selected "produce was grown in my local area" compared to participants between ages 21 and 24. A smaller percentage of those age 65 and older selected "produce was grown using "certified" organic methods" compared to participants between ages 21 and 64 (Table 3.2). When responses were segmented by ethnic group (Table 3.3) a greater percentage of White/Anglo participants selected "produce was grown in my local area" compared to participants from all other ethnic groups. Conversely, a greater percentage of Asian American participants selected "produce was grown using "certified" organic methods" compared to White/Anglo participants.

Comparing Preferences for "Locally Grown Only" to "Certified Organic Only"

When participants were asked if they would prefer locally grown produce or certified organic produce in Survey 2 (Table 3.4, Comparison 5) the majority of participants selected the option "locally grown" (71%). When preferences were examined between demographic groups differences were found across age groups and ethnic groups, and between individuals with and without children living in the household.

Comparisons Across Demographic Groups

Groups that were more likely to select the "locally grown only" option were: those ages 37 and older compared to those ages 21 to 36 (across sub-categories) (Table 3.5), White/Anglo participants compared to those from all other ethnic groups (Table

3.6), and those without children in the household compared to those with children in the household (Table 3.7).

Table 3.4. The six pair-wise comparisons analyzed in this study.

Comparisons	Option A		Option B	
	Locally Grown	Certified Organic	Locally Grown	Certified Organic
1	yes	yes	yes	no
2	yes	yes	no	yes
3	yes	yes	no	no
4	yes	no	no	no
5	no	yes	yes	no
6	no	yes	no	no

Table 3.5. Relative option preferences (%) across age groups for each of the six pair-wise comparisons.

Comparisons[z]	Age group				
	21-24	25-36	37-48	49-64	≥65
1. Selected certified organic (Option A) over conventional (Option B) given that both options included locally grown[yx]	85a	75b	64c	57d	49e
2. Selected locally grown (Option A) over conventional (Option B) given that both options included certified organic	86ab	82b	87ab	89a	82b
3. Selected locally grown and certified organic (Option A) over not locally grown and conventional (Option B)	87a	83a	82a	85a	74b
4. Selected locally grown (Option A) over not locally grown and conventional (Option B)	85a	85a	89a	90a	87a
5. Selected locally grown (Option B) over certified organic (Option A)	54c	61c	70bc	75ab	79a
6. Selected certified organic (Option A) over not locally grown and conventional (Option B)	83a	76a	65bc	68b	60c

[z]See Table 3.4 for complete description of all comparisons and options.
[y]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[x]Percentages followed by common letters within rows and demographic categories are not significantly different.

Table 3.6. Relative option preferences (%) across ethnic groups for each of the six pair-wise comparisons.

Comparisons	Ethnic Group			
	White/Anglo	Black/African[x]	Asian	Hispanic
1. Selected certified organic (Option A) over conventional (Option B) given that both options included locally grown[zy]	59b	76a	75ab	82a
2. Selected locally grown (Option A) over conventional (Option B) given that both options included certified organic	88a	84a	69a	74a
3. Selected locally grown and certified organic (Option A) over not locally grown and conventional (Option B)	84a	84a	78a	72a
4. Selected locally grown (Option A) over not locally grown and conventional (Option B)	90a	87ab	68c	77bc
5. Selected locally grown (Option B) over certified organic (Option A)	74a	61b	53b	44b
6. Selected certified organic (Option A) over not locally grown and conventional (Option B)	62a	73a	56a	70a

See Table 3.4 for complete description of all comparisons and options.

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.

[y]Percentages followed by common letters within rows and demographic categories are not significantly different

[x]Black/African=Black/African American, Asian=AsianAmerican, Hispanic=HispanicAmerican

Stated Relative Preferences for Characteristics of Locally Grown and Certified Organic

In Survey 2, participants were asked to select an option (Option A vs. Option B) from each of six pair-wise comparisons regarding their preference for locally grown and certified organic fruits and/or vegetables (Table 3.4). In Comparison 1, both options were locally grown but only Option A was certified organic. In Comparison 2, both options were certified organic, but only Option A was locally grown. In 3, Option A included both locally grown and certified organic and was compared to not locally grown and conventional (Option B). Comparisons 4 and 6 compared locally grown (Option A, Comparison 4) and certified organic (Option A, Comparison 6) to not locally grown and conventional (Option B). In 5, locally grown (A) was directly compared to Option B,

certified organic (discussed in the above results section). Results from these six comparisons were used to assess consumers' relative preferences for: 1) locally grown, whether certified organic or not, 2) certified organic, whether locally grown or not, and 3) certified organic and locally grown relative to options that have only one of these characteristics.

Consumers' Relative Preferences for Locally Grown Produce, Whether Certified Organic or Not (Comparisons 2 and 4)

Comparison 2. For Comparison 2, both options included certified organic, while Option A was locally grown and B was not. Overall, the majority of participants selected the option containing locally grown (Option A, 87%). Statistically different responses were found between age groups (Table 3.5), gender (Table 3.7), presence of children in the household (Table 3.8), and income levels (Table 3.9). Compared to participants between ages 25 and 36 and ages 65 and older, a greater percentage of those between ages 49 and 64 selected Option A. Additionally, a greater percentage of female participants selected Option A compared to male participants. This was also true when responses of those without children in the household were compared to those with children in the household. Lastly, a greater percentage of participants with annual income levels of $25,000 to $74,999 (across sub-categories) and $100,000 and greater selected Option A (locally grown) compared to participants with an income level of less than $25,000.

Table 3.7. Relative option preferences (%) between gender for each of the six pair-wise comparisons.

Comparisons[z]	Gender	
	Male	Female
1. Selected certified organic (Option A) over conventional (Option B) given that both options included locally grown[yx]	58a	63a
2. Selected locally grown (Option A) over conventional (Option B) given that both options included certified organic	83b	88a
3. Selected locally grown and certified organic (Option A) over not locally grown and conventional (Option B)	73b	85a
4. Selected locally grown (Option A) over not locally grown and conventional (Option B)	84b	90a
5. Selected locally grown (Option B) over certified organic (Option A)	69a	71a
6. Selected certified organic (Option A) over not locally grown and conventional (Option B)	61b	71a

[z]See Table 3.4 for complete description of all comparisons and options.
[y]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[x]Percentages followed by common letters within rows and demographic categories are not significantly different

Table 3.8. Relative option preferences (%) between presence of children in the household for each of the six pair-wise comparisons.

Comparisons[z]	Presence of children in the household	
	Without Children	With Children
1. Selected certified organic (Option A) over conventional (Option B) given that both options included locally grown[yx]	60b	66a
2. Selected locally grown (Option A) over conventional (Option B) given that both options included certified organic	89a	83b
3. Selected locally grown and certified organic (Option A) over not locally grown and conventional (Option B)	83a	82a
4. Selected locally grown (Option A) over not locally grown and conventional (Option B)	90a	85b
5. Selected locally grown (Option B) over certified organic (Option A)	74a	64b
6. Selected certified organic (Option A) over not locally grown and conventional (Option B)	69a	68a

[z]See Table 3.4 for complete description of all comparisons and options.
[y]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[x]Percentages followed by common letters within rows and demographic categories are not significantly different

Table 3.9. Relative option preferences (%) across income levels for each of the six pair-wise comparisons.

Comparisons[z]	Income level				
	<$25,000	$25,000-$49,999	$50,000-$74,999	$75,000-$99,999	≥$100,000
1. Selected certified organic (Option A) over conventional (Option B) given that both options included locally grown[yx]	61a	60a	65a	58a	67a
2. Selected locally grown (Option A) over conventional (Option B) given that both options included certified organic	80b	89a	87a	85ab	90a
3. Selected locally grown and certified organic (Option A) over not locally grown and conventional (Option B)	75b	84a	86a	81ab	85a
4. Selected locally grown (Option A) over not locally grown and conventional (Option B)	83b	87b	89b	94a	90ab
5. Selected locally grown (Option B) over certified organic (Option A)	63a	74a	73a	72a	69a
6. Selected certified organic (Option A) over not locally grown and conventional (Option B)	62b	66ab	72a	71a	72a

[z]See Table 3.4 for complete description of all comparisons and options.
[y]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[x]Percentages followed by common letters within rows and demographic categories are not significantly different

Comparison 4. However, in Comparison 4, where participants had to choose either locally grown or not locally grown, given that both were conventional, participants selected locally grown (Option A, 89%). A statistically greater percentage of those describing themselves as White/Anglo selected this option, compared to Asian Americans and Hispanic Americans (Table 3.6). A statistically greater percentage of participants without children also selected locally grown (Option A) compared to those with children in the household (Table 3.8). Furthermore, a statistically greater percentage of participants with income levels of $75,000 to $99,999 selected locally grown compared to those with annual income levels of $74,999 or less (Table 3.9). Lastly, a

statistically greater percentage of females, compared to that of males, selected this option (Table 3.7).

Consumers' Relative Preferences for Certified Organic Produce, Whether Locally Grown or Not (Comparisons 1 and 6)

Comparison 1. In Comparison 1, both options included locally grown, while Option A was also certified organic and B was conventional. Overall, the majority of participants selected Option A, certified organic (62%). Several statistical differences were detected across ethnic groups, age groups, and presence of children in the household. Specifically, Black/African American participants were more likely to select Option A compared to White/Anglo participants (Table 3.6). Additionally, each age group was more likely to select certified organic compared to all older age groups and less likely compared to all younger groups (Table 3.5). Those with children in the household were also more likely to select this option versus participants without children in the household (Table 3.8).

Comparison 6. Overall, in Comparison 6, in which certified organic was compared to conventional and where both were not locally grown, more participants selected certified organic (69%). Specifically, a significantly higher percentage of participants between ages 21 and 24 and between ages 25 and 36 selected certified organic compared to participants between age 37 and older (across sub-categories, Table 3.5). Additionally, a significantly higher percentage of participants with income levels of $50,000 or greater (across sub-categories) selected certified-organic versus those with income levels of $25,000 or less (Table 3.9). Finally, a statistically greater percentage of females selected certified organic compared to that of males (Table 3.7).

Consumers' Relative Preferences for Locally Grown and Certified Organic Produce, Versus All Other Pairings (Comparisons 1, 2, and 3)

Comparisons 1, 2, and 3. As explained earlier in the results for Comparisons 1 and 2, where locally grown and certified organic were also paired together for Option A, this pairing was also preferred over locally grown alone, selected by 62% of participants, and over certified organic alone (87%). In Comparison 3, locally grown and certified organic were paired together and compared to not locally grown and conventional. Overall, the majority of participants preferred the option locally grown and certified organic (83%).

Comparison 3. For Comparison 3, a statistically greater percentage of participants with income levels of $25,000 to $74,999 (across sub-categories) and $100,000 or greater selected Option A, locally grown and certified organic, compared to participants with annual income levels of less than $25,000 (Table 3.9). Additionally, a statistically greater percentage of female participants also selected this option compared to that of males (Table 3.7).

Discussion

Results suggest that consumers prefer produce to be both locally grown and certified organic when compared to options where the produce is neither locally grown nor certified organic. However, the preference for locally grown is stronger than the preference for certified organic. When segmented by demographic group, (e.g. age range, ethnicity, education level), a clearer picture emerges with respect to the specific type of consumer with a stronger relative preference for local produce. Participants age 37 and older, those describing themselves as White/Anglo, those without children living

in the household, females, and participants with income levels $25,000 and greater exhibited a stronger preference for these options (each group examined independently, Table 3.3). Those who exhibited a stronger relative preference for certified organic (each group examined independently), compared to their counterparts, included participants under age 37, Black/African Americans, Asian Americans, and Hispanic Americans, participants with children living in the household, females, and participants with income levels $25,000 and greater. Produce industry members in the mid-Atlantic U.S. region growing or selling locally grown and/or certified organic produce can take these preferences for locally grown and organic into account, as well as likely purchasers of these products, when deciding what consumer demographics to target when devising marketing strategies.

Although data from current national and regional literature is inconsistent in showing consumers' preferences for locally grown and/or certified organic produce/value-added processed products, studies indicate that consumers have an obvious preference for both types of products and most indicate that consumers prefer locally grown products to certified organic (Anonymous, 2005; Loureiro and Hine, 2002; Rutberg, 2008; Science Daily, 2009; Supermarket News, 2008). Results from this study support these general findings. Other literature complements our findings that Black/African American, Asian and Hispanic Americans were found to use more organic products (Dettmann and Dimitri, 2010; The Hartman Group, 2006) and that characteristics of "locally grown" buyers include consumers age 37 and older (Bean, 2008); as well as female consumers and those with higher household income levels (Jekanowski et. al, 2000).

However, our research contradicts other findings, such as a 2009 marketing study conducted by the United States Department of Agriculture which revealed that ethnic group, presence of children in the household, and income level, do not have a consistent effect on the likelihood of purchasing organic products (Dimitri and Oberholtzer, 2009), albeit the 2009 study analyzed actual purchases of organic products while our research focused on examining consumer preferences. Bean (2008) also found that older consumers were supportive of certified organic food while female consumers were not. A possible explanation for the differences between results is the population that was surveyed, which may have included surveying participants from other regions of the country or those living outside of metropolitan areas and/or with more rural backgrounds. Individuals living in more rural areas may be have better access to locally produced foods and/or more likely to have farming backgrounds, thereby exhibiting potential differences in preferences for locally produced and/or certified organic foods. The focus of future research should expand beyond major metropolitan areas in the mid-Atlantic region and include consumers from more rural areas in order to better understand preferences for locally grown and certified organic produce from a broader range of consumers.

Industry members (e.g., growers, retailers, extension personnel, government agencies and associations) looking to incorporate new marketing strategies, educational programs, and/or promoting and developing local food businesses should take into account that preferences and purchasing behavior for locally grown and certified organic produce may vary within different markets in the mid-Atlantic U.S. region, and while results from this study can be used as a guide for constructing new marketing strategies, these should nonetheless be tailored to consumers residing in targeted local areas.

References

Anonymous. 2005. Local still more popular than organic. Bee Culture 133(3):59.

Bean, M. 2008. Consumer support for local and organic foods in Ohio. Ohio State Univ., Columbus, PhD Diss.

Berlin, L., Lockeretz, W. and R. Bell. 2009. Purchasing foods produced on organic, small and local farms: A mixed method analysis of New England consumers. Renewable Agr. and Food Systems 24:267-275.

Bond, J.K., Thilmany, D., and C.A. Bond. 2006. Direct marking of fresh produce: understanding consumer purchasing decisions. Retrieved from: <http://www.choicesmagazine.org/2006-4/produce/2006-4-06.htm>.

Darby, K., Batte, M.T., Ernst, S., and B. Roe. 2006. Willingness to pay for locally produced foods: a customer intercept study of direct market and grocery store shoppers. Retrieved from: <http://ageconsearch.umn.edu/bitstream/21336/1/sp06da03.pdf>.

Dettmann, R. and Dimitri, C. 2010. Who's buying organic vegetables? Demographic characteristics of U.S. consumers. J. of Prod. Mktg. 16:79-91.

Dimitri, C. and Oberholtzer, L. 2009. Marketing U.S. organic foods: Recent trends from farms to consumers. U.S. Dep. Agr., Washington, D.C.

Duffy, M.P. n.d. Emerging markets. Retrieved from: <http://www.growingmagazine.com/arrticle.php?id=5260>.

The Hartman Group. 2006. Who's buying organic? Demographics 2006. Retrieved from: <http://www.hartman-group.com/hartbeat/who-buying-organic-demographics-2006>.

The Hartman Group. 2007. What makes local special? Retrieved from: <http://www.hartmangroup.com/hartbeat/2007-01-24>.

The Hartman Group. 2008. Consumer understanding of buying local. Retrieved from: <http://www.hartman-group.com/hartbeat/2008-02-27>.

Jekanowski, M., Williams, D. and W. Schiek. 2000. Consumers' willingness to purchase locally produced agricultural products: An analysis of an Indiana survey. Retrieved from: <http://ageconsearch.umn.edu/bitstream/31329/1/29010043.pdf>.

Loureiro, M. and Hine, S. 2002. Discovering niche markets: a comparison of consumer willingness to pay for local (Colorado-Grown), organic, and GMO-free products. J. Ag. and Appl. Econ. 34(3):477-487 (abstr.).

Organic Trade Association. 2009. 2009 U.S. families' organic attitudes & beliefs study. Retrieved from: <http://www.ota.com/organic/www.ota.com/pics/documents/01b_Final-OTAKiwiExecutiveSummary.pdf>.

Progressive Grocer. 2007. Buy local vs. organic food a tough decision for consumers: Survey. Retrieved from: <http://www.progressivegrocer.com/print-topstory-buy_local_vs._organic_food_a_tough_decision_for_consumers__survey-23399.html>.

Rutberg, S. 2008. Local or organic? Shoppers say 'both, please.' Natural Foods Merchandiser 29(5):30.

ScienceDaily. 2009. Organic or local fruits and vegetables? Retrieved from: <http://www.sciencedaily.com/releases/2009/09/090903163951.htm>.

Scott-Thomas, C. 2009. Organic foods are now 'mainstream,' says USDA. Retrieved from: <http://www.foodnavigator-usa.com/Product-Categories/Cereals-and-bakery-preparations/Organic-foods-are-now-mainstream-says-USDA>.

Supermarket News. 2008. Report: Consumers prefer local over organic. Retrieved from: <http://supermarketnews.com/news/local_organic_0617/>.

Supermarket News. 2010. Survey: U.S. organic product sales reach $26.6B in 2009. Retrieved from: <http://supermarketnews.com/news/organic_sales_0422/>.

CHAPTER 4.

MID-ATLANTIC CONSUMER PURCHASING BEHAVIOR AND KNOWLEDGE OF LOCALLY GROWN AND SEASONAL PRODUCE

Summary

Mid-Atlantic area consumers were surveyed about their fruit and vegetable purchasing behaviors and their knowledge of produce grown in the region. Consumers were generally unaware of the types of produce grown in the mid-Atlantic and during what months they are harvested. Additionally, there were differences pertaining to number of produce items purchased based on demographic characteristics. Retailers and extension education can use this information as the basis for developing marketing and consumer educational efforts.

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 with over 12,500 farms having offered a CSA (Community Supported Agriculture) program in 2007 (USDA, 2007). Though demand exists, many consumers are still unaware of where their produce originates (Ikerd, 2001), what types of fruits and vegetables they can purchase from local/regional sources, and when these items are available (Harmon, 1999). A study involving Pennsylvania high school students revealed that students were only able to correctly answer 58% of questions pertaining to food origins, and that few could identify a group of spring produce (40%) and fall produce (20%) (Harmon, 1999). Results from a survey conducted with New York University students indicated that students were each generally able to identify three local foods, however, potatoes, apples, and lettuce were among foods students listed as "not seasonal" (Wilkins et. al., 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. Consumers who purchase from farmers' markets and other local venues are usually highly educated, professional, medium-old aged, white, female, and belong to households of two members and have greater levels of income or socioeconomic status, and demographics of those who frequent these markets are very similar to those who purchase more produce items in general (Govindasamy et. al., 2002; Wardle et. al., 2004; Elepu, 2005; Kiefer et. al., 2005; Zenk et. al., 2005; Dubowitz et. al., 2008; Stewart & Lucier, 2009; and Severson, 2010).

Research is needed to understand primary food shopper knowledge of these issues, specifically, consumers residing in the mid-Atlantic region as this region 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 (Schepp, 2010), as many of these farms may serve markets and consumers in their local areas. Past research has focused on subjects from this region, 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.

Consumer response to a comprehensive list of fruits and vegetables commonly available at supermarkets may provide a more realistic sense of purchasing behavior and knowledge of produce in the region since the majority of consumers turn to supermarkets to purchase produce. If results indicate that consumers purchase a variety of produce that

can be grown in the mid-Atlantic, but knowledge of produce origins and seasonality is lacking, retailers of locally grown produce and extension personnel may choose to educate consumers about the types of produce grown locally and when the items are harvested in order to meet consumer desire for 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

Materials and Methods

Data were collected through two separate 15 minute Internet surveys (Surveys 2 and 4 conducted 7-10 Apr. 2009 and 23-25 Mar. 2010, respectively) developed using SurveyMonkey (Palo Alto, CA) and administered to an average of 1,638 Survey Sampling International, LLC (Shelton, CT) panelists residing in five metropolitan areas in the mid-Atlantic U.S. region (Richmond, VA; Washington, D.C., Philadelphia, PA; Baltimore, MD; and New York City, NY). 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 were analyzed with SPSS (versions 17, 18 and 19; SPSS, Chicago, IL). To assess differences between responses across demographic groups (Table 4.1), Pearson's Chi Square (X^2) 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.

Table 4.1. Summary of demographics for Survey 2 participants.

	Survey 2 No. (%)
Age Group	
21-24	95 (6)
25-36	237 (14)
37-48	404 (24)
49-64	800 (47)
≥65	169 (10)
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	
White/Anglo	1349 (82)
Black/African[z]	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)

[z]White = Black = Black/African American, Asian = Asian American, Hispanic = Hispanic American

Results

Purchasing Behavior of Mid-Atlantic Fruits and Vegetables

Survey 2 participants were asked to indicate which items they had purchased from a list of 32 fruits and vegetables that can be grown in the mid-Atlantic and are commonly sold throughout the year at supermarkets (Table 4.2). Participants selected 22 types of produce on average, with apples purchased by most, followed by corn and tomatoes. The least popular items included eggplants and squash.

Table 4.2. 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 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 and/or all 32 items. Responses were compared across a number of demographic. Statistically significant differences were found within various demographic groups between age groups (Table 4.3), number of adults in the household (Table 4.4), income level (Table 4.5), gender (Table 4.6), and ethnic groups (Table 4.7).

Table 4.3. Percentage of consumers purchasing over half (17 or more) of the 32 produce items analyzed in this study segmented by age group.

Variable	Age Group				
	21-24	25-36	37-48	49-64	≥65
Purchased 17-32 items (%)[zy]	55c	67b	73ab	77a	76a

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.

[y]Percentages followed by common letters within rows and demographic categories are not significantly different

Table 4.4. Percentage of consumers purchasing over half (17 or more) of the 32 produce items analyzed in this study segmented by number of adults in the household.

Variable	Number of adults in the household			
	1	2	3	4 or more
Purchased 17-32 items (%)[zy]	65b	74a	79a	83a

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Table 4.5. Percentage of consumers purchasing over half (17 or more) of the 32 produce items analyzed in this study segmented by income level.

Variable	Income Level				
	<$25,000	$25,000-$49,999	$50,000-$74,999	$75,000-$99,999	≥$100,000
Purchased 17-32 items (%)[zy]	65b	70ab	75ab	81a	78a

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Table 4.6. Percentage of consumers purchasing over half (17 or more) of the 32 produce items analyzed in this study by gender.

Variable	Gender	
	Male	Female
Purchased 17-32 items (%)[zy]	66b	75a

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Table 4.7. Percentage of consumers purchasing over half (17 or more) of the 32 produce items analyzed in this study by ethnic group.

Variable	Ethnic Group			
	White/Anglo	Black/African[x]	Asian	Hispanic
Purchased 17-32 items (%)[zy]	75a	66b	73ab	62ab

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.
[x]Black/African=Black/African American, Asian=Asian American, Hispanic=Hispanic American

Consumer Differences Across Demographic Groups

Variety of fruits and vegetables purchased increased with age, as a statistically greater percentage of participants ages 49 and older purchased more than half of the produce items listed compared to those between ages 21 and 36 (across sub-categories) (Table 4.3). A statistically greater percentage of participants with two or more adults in the household (across sub-categories) also purchased more than half of produce items listed compared to those with only one adult in the household (Table 4.4). Those having income levels $75,000 and above (across sub-categories) were also statistically more likely to purchase these number of items compared to their counterparts with income levels below $25,000 (Table 4.5). Females compared to males also purchased a statistically greater variety of produce items than did males (Table 4.6). Lastly, those describing themselves as White/Anglo as compared to Black/African American participants reported purchasing a statistically greater variety of produce (Table 4.7).

Knowledge of What Fruits and Vegetables are Grown in the Mid-Atlantic U.S. Region

Using the same list of fruits and vegetables, participants were asked to indicate which they believed were grown in the mid-Atlantic region (Table 4.2). Of this list, the majority were 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 for further testing in Survey 4 to determine knowledge of when these items are harvested in the mid-Atlantic, as data from Survey 2 showed that they were among the produce items commonly purchased by respondents (Table 4.2). Participants were asked to indicate the calendar months they believed the five items were harvested from farms located in this region. They could also indicate that they believed the item was not grown in the mid-Atlantic. As there are nine horticultural growing zones that exist within this region (USDA, 2003), and fruits and vegetables have specific harvesting periods, responses were deemed correct if participants selected month(s) when the item could be harvested within any zone in the mid-Atlantic.

Only a small 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 4.8). Less than half were able to identify months during which lettuce, grapes, or potatoes are harvested in the region. Additionally, 7% to 34% incorrectly selected that these five items were not grown in the mid-Atlantic.

Table 4.8. Consumers' perceptions of when specific various fruits and vegetables are harvested in the mid-Atlantic region.

	Fruit/Vegetable (%)[z]				
Month that Participants Indicated each Fruit and Vegetable was Harvested	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

[z]Percentages 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 can be grown in the region and are even less informed about the months during which the items are harvested, which can be an indication of when fresh produce is available for purchase from local venues. 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. Additionally, our results suggest that most consumers are unaware 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. Results are indicative of the Wilkins et. al. study (2000) which

found that New York University students incorrectly identified produce, such as apples and potatoes, as non-seasonal goods.

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 (Elepu, 2005). Individuals who reported purchasing a greater variety of produce in our study were also more likely to be older than 24 years, have an 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 et. al., 2002; Wardle et. al., 2004; Elepu, 2005, Kiefer et. al., 2005; Zenk et. al., 2005; Dubowitz et. al., 2008; Stewart & Lucier, 2009; and Severson, 2010).

Retailers and extension personnel can use this data as a guide for developing educational materials to inform mid-Atlantic consumers interested in purchasing locally grown produce items about what produce can be grown locally and during what months of the year they are available fresh for purchase. This knowledge may then encourage interested consumers to purchase these items. Future research should focus on examining consumer knowledge for local and seasonal produce within more rural areas of the mid-

Atlantic region, as these consumers may have more exposure to these items due to proximity to farms and/or have farming/gardening backgrounds. If rural consumers are indeed more knowledgeable of local and seasonal produce, efforts could be concentrated on urban consumers. Extension personnel and other industry stakeholders looking to incorporate new consumer 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.

References

Dubowitz, T., Heron, M., Bird, C., Lurie, N., Finch, B., Basurto-Davila, R., Hale, L., and J. Escarce. 2008. American Journal of Clinical Nutrition. 87(6), 1883-1891.

Elepu, G. 2005. Urban and Suburban Farmers Markets in Illinois: A Comparative Analysis of Consumer Segmentation Using Demographics, Preferences, and Behaviors. (Doctoral Dissertation). University of Illinois at Urbana-Champaign, Champaign, IL.

Govindasamy, R., Italia, J, and A. Adelaja. 2002. Farmers' Markets: Consumer Trends, Preferences, and Characteristics. Journal of Extension [On-line], 40(1) Article 1RIB6. Retrieved from: <http://www.joe.org/joe/2002february/rb6.php>.

Harmon, A. 1999. Food System Knowledge, Attitudes and Experiences. (Doctoral Dissertation). Pennsylvania State Univ., University Park, PA.

Ikerd, J. 2001. Proceedings from Reconnecting Consumers and Farmers Conference ’01: *Reconnecting consumers and farmers in the food system*. Columbus, OH: Citizens Policy Center, Innovative Farmers of Ohio and Ohio Citizens Action.

Kiefer, I., Rathmanner, T., and M. Kunze. 2005. Eating and Dieting Differences in Men and Women. The Journal of Men’s Health and Gender, 2(2), 194-201.

Schepp. 2010. Local food movement gives small farms a big boost. Daily Finance. Retrieved from: <http://www.dailyfinance.com/story/real-estate/local-food-movement-gives-small-farms-a-big-boost/19627166/>.

Severson, K. 2010. Told to Eat Its Vegetables, America Orders Fries. *The New York Times.* Retrieved from: <http://www.nytimes.com/2010/09/25/health/policy/25vegetables.html>.

Stewart, H. and Lucier, G. 2009. Younger Consumers Exhibit Less Demand for Fresh Vegetables. U.S. Department of Agriculture, Economic Research Service (ERS). VGS-333(01). Retrieved from: <http://www.ers.usda.gov/Publications/VGS/2009/08Aug/VGS33301/VGS33301.pdf>.

U.S. Department of Agriculture, U.S. National Arboretum (USNA). 2003. USDA Plant Hardiness Zone Map. Retrieved from: http://www.usna.usda.gov/Hardzone/hzm-ne1.html

U.S. Department of Agriculture, Agricultural Marketing Service (AMS). 2009. Farmers market growth: 1994-2009. Retrieved from: <http://www.ams.usda.gov/>.

U.S. Department of Agriculture, National Agricultural Statistics Service (NASS). 2007. 2007 Census of Agriculture-State data. Retrieved from: <http://www.agcensus.usda.gov/>.

U.S. Census Bureau. (n.d.) 2010 Census Data. Retrieved from: <http://2010.census.gov/2010census/data/>.

Wardle, J., Haase, A., Steptoe, A., Nillapun, M., Jonwutiwes, K., and F. Bellisie. 2004. Gender Differences in Food Choice: The Contribution of Health Benefits and Dieting. Annals of Behavioral Medicine 27(2), 107-116.

Wilkins, J., Bowdish, E., and J. Sobal. 2000. University student perceptions of seasonal and local foods. Journal of Nutrition Education. 32(5): 261-268.

Zenk, S., Schulz, A., Hollis-Neely, T., Campbell, R., Holmes, N., Watkins, G., Nwankwo, R., and A. Odoms-Young. 2005. Fruit and Vegetable Intake in African Americans. American Journal of Preventive Medicine, 29(1), 1-9.

CHAPTER 5.

STATE PROMOTIONAL PROGRAMS IN THE MID-ATLANTIC REGION: CONSUMER AWARENESS, ATTITUDES AND BEHAVIOR

Summary

Consumers living in five mid-Atlantic metropolitan areas were surveyed on their awareness of four state promotional programs and their purchases of fresh produce and value-added processed products marketed through these programs. Results indicate that consumers generally lack awareness of these state promotional programs, but those who were aware of these programs and purchased value-added processed products branded by these programs reported that they were slightly more likely to purchase state branded items over non-state branded items. Extension personnel can use data to educate consumers about the programs' existence, types of food items marketed, and venues from which items can be purchased.

Introduction

Almost every state in the U.S. has developed a program designed to promote agricultural products grown or produced within its borders (Onken & Bernard, 2010). Although state promotional programs, in some form or another, have existed since the 1930's (Patterson et. al., 1999), the majority of programs were created fairly recently, as a means of taking advantage of the burgeoning consumer demand for local and regional value-added processed products (Carpio & Isengildina-Massa, 2009). Studies, including results in earlier chapters, have revealed a consumer preference for state-grown produce over produce grown outside of their state (Patterson et al. 1999; Jekanowski et. al, 2000; Patterson & Martinez, 2004; Carpio & Isengildina-Massa, 2009). Studies have also shown that consumers are willing to pay a price premium for items grown in-state and/or

those branded by a state promotional program (Loureiro & Hine, 2002; Giraud et. al., 2005; Darby et. al., 2008; Carpio & Isengildina-Massa, 2010).

Although consumer preference and willingness to pay for state grown/produced value-added processed products should be a good indicator of program knowledge, current literature is somewhat inconsistent as to public awareness about existing programs. For example, only about one-third of consumers living in South Carolina and Arizona were aware of their states' promotional programs (Carpio & Isengildina-Massa, 2010; Patterson & Martinez, 2004). Also, a 2009 survey of consumers residing in five mid-Atlantic states (Delaware, Maryland, New Jersey, Virginia, and Pennsylvania) revealed that the majority of consumers (84% of New Jersey 66% of Virginia, and 52% of Maryland participants) were aware of their state's promotional program (Onken & Bernard, 2010). However, an earlier study focusing on "Jersey Fresh" showed that program awareness was greater among consumers living in rural areas compared to those living in suburban and urban areas (Govindasamy et. al., 1999).

Research Objectives

- Investigate consumer awareness of four state promotional programs in the mid-Atlantic region: Jersey Fresh, Pennsylvania Preferred, Pride of New York, and Virginia Grown
    - Examine awareness among consumers across multiple states and metropolitan areas to paint a more accurate portrayal of the markets for each of the programs, which may serve more than one state and/or metropolitan area

    - Further examine awareness by asking consumers to identify the correct brand name for a state's program
- Determine if there are preferences for produce and value-added processed products branded with a state promotional program
- Compare consumer responses between demographic groups based on metropolitan area and state of residence

Materials and Methods

Data were collected during a 15 min. Internet survey (Survey 4, 23-25 of Mar. 2010) developed using SurveyMonkey.com (Palo Alto, CA) and administered to consumers (1,518) residing in five metropolitan areas in the mid-Atlantic U.S. region (Richmond, Baltimore, Washington, D.C., New York City, Philadelphia). 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 (Shelton, CT). Panelists received an electronic consent statement along with a link to the survey 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 (as questions about alcohol products and consumption were asked) and also if they were the primary shopper for their household.

Survey data were analyzed with SPSS (versions 17, 18, and 19; SPSS, Chicago, IL). To assess differences between responses across demographic groups (Table 5.1), Pearson's Chi Square (X^2) and Phi and Cramer's V tests were used to analyze responses

for categorical and/or multiple-choice questions, and Kruskal-Wallis and Mann-Whitney U tests for Likert-Scale questions.

Table 5.1. Summary of demographics for Survey 4 participants.

Variable	No. (%)	Variable	No. (%)
Metropolitan Area		State of Residence	
Richmond	115 (8)	New Jersey	370 (32)
Washington, D.C.	249 (16)	New York	349 (30)
Philadelphia	298 (20)	Pennsylvania	207 (18)
Baltimore	193 (13)	Virginia	235 (20)
New York City	663 (44)		

Results

Awareness of State Promotional Programs

Twenty-three percent of participants indicated they were aware that their state of residence had a state promotional program (data not shown). Participants were then prompted to select the correct name for four state programs targeted from a list of three options: 1) the correct name; 2) a fictitious name; or 3) "I don't know" (Table 5.2). Nearly half correctly selected "Jersey Fresh." However, only less than one fourth correctly identified Pennsylvania's and Virginia's state promotional programs. Additionally, a smaller percentage of participants selected the correct name for New York's program than those who selected the incorrect name.

Table 5.2. Participants' recognition of state branding programs of those who indicated they were aware of their state's promotional program.

Correct Brand Name		Incorrect Brand Name		"I Don't Know"
	(%)		(%)	(%)
Jersey Fresh	47	Jersey's Own	33	20
Pride of NY	18	Home Grown NY	20	62
PA Preferred	20	PA Perfect	17	64
Virginia Grown	21	Virginia's Best	15	65

Purchasing Behavior Towards State Promotional Program Fresh Produce and Value-Added Processed Products

Of the 23% of participants who reported being aware that their state of residence had a state promotional program, 64% stated that they had intentionally purchased state-branded fresh fruits and vegetables while 33% reported purchasing state-branded fruit or vegetable-based processed products. When asked to indicate the state program used to market the products (Table 5.3) the majority of these participants reported fresh fruit(s) and/or vegetable(s) they purchased were branded "Jersey Fresh," and a smaller percentage reported that the brand was "Pride of New York," "Pennsylvania Preferred," or "Virginia Grown." Half of those who reported purchasing processed products selected "Jersey Fresh" as the brand of processed item purchased, and less than one third of participants selected "Pride of New York," "Virginia Grown," and "Pennsylvania Preferred" as the brand of items purchased.

Table 5.3. Brand names of the fresh produce and value-added processed products that participants purchased from state promotional programs (of those who responded that they purchased state branded fresh produce and value-added processed products) in the mid-Atlantic region.

	Proportion of participants who purchased items that were promoted by a state promotional programs	
State Promotional Program	Fresh produce (%)	Value-added processed products (%)
Jersey Fresh	69	50
Pride of NY	25	30
Pennsylvania Preferred	15	21
Virginia Grown	16	28

This subset of participants who had intentionally purchased state branded items were then asked to indicate the types of retailers from which they purchased state branded fresh produce and value-added processed products (Table 5.4). The majority of this subset reported that they purchased fresh produce and value-added processed items from a grocery store/supermarket. A near majority reported purchasing fresh produce from farmers' markets and value-added processed products from this venue. Less than a quarter of participants selected other retailers, such as specialty food stores, warehouse clubs, supercenters as venues where they purchased both types of state branded items.

Table 5.4. Retailers from which participants (of those that purchased state branded fresh produce and value-added processed products) purchased fresh produce and value-added processed products promoted by a state promotional program in the mid-Atlantic region.

Variable	Fresh Produce	Value-Added Processed Products
Grocery store/supermarket	78	58
Farmers' markets	49	41
Specialty food stores	18	24
Warehouse clubs	17	20
Supercenters	17	23
Convenience stores	1	3
Discounters	4	12
Internet/Catalog/Mail-Order service	3	2
Natural food store	4	5

Preferences for Items Branded by State Promotional Programs Compared to Items Not Branded by State Promotional Programs

Overall, state brand purchasers were "slightly more likely" to purchase state-branded fresh produce (mean rating of 4.0 on a scale of 1= "less likely" and 5 = "more likely") over produce that was not branded by a state promotional program. Additionally, they also expressed a preference for state branded value-added processed products (mean rating = 3.8) over identical non-state branded processed items.

Comparing Differences Across Consumer Groups

Results showed statistical differences between states and metropolitan areas of residence for the following variables: state promotional program awareness, purchasing behavior, preferences for state branded items, and retailers from which state branded items were purchased. Although differences exist, awareness of whether or not their state had a branding program was the only variable with enough responses to allow for further testing.

A statistically greater percentage of participants living in New Jersey indicated being aware that their state had a branding program compared to participants from all other states (Table 5.5). Pertaining to metropolitan area of residence, a statistically greater percentage of those living in Richmond, Philadelphia, and New York City metropolitan areas reported being aware of their state's promotional program compared to those living in Washington, D.C. and Baltimore metropolitan areas (Table 5.5).

Table 5.5. Awareness of state promotional programs segmented by participants' state and metropolitan areas of residence.

Aware that State Promotional Program Exists (%)				
State of Residence				
New Jersey	New York	Pennsylvania	Virginia	
35a[zy]	18b	15b	21b	
Metropolitan Area				
Richmond	Washington, D.C.	Philadelphia	Baltimore	New York City
27a[zy]	12b	21a	11b	24a

[z]Pearson's Chi-Square test was used to determine significant differences between values at the level of $p \leq 0.05$.
[y]Percentages followed by common letters within rows and demographic categories are not significantly different.

Discussion

Results from the current study indicate that urban mid-Atlantic consumers are generally unaware that their state has a promotional program. This is in contrast to past research, which report high awareness of state promotional programs in the mid-Atlantic (Onken & Bernard, 2010) especially for "Jersey Fresh," (Onken & Bernard, 2010; Govindasamy et. al, 1999). Their samples, however, may have also included residents living in more rural areas (Govindasamy et. al, 1999), which could explain the differences in our findings as these consumers may have greater access and exposure to state promotional programs and state-branded products.

Other aspects of our study results do support other findings, however. Participants exhibited a preference for purchasing state branded value-added processed products, as was shown in many other studies (Patterson et al. 1999; Jekanowski et. al, 2000; Patterson & Martinez, 2004; Carpio & Isengildina-Massa, 2009). Yet although most urban residents were unaware of the "Jersey Fresh" program, the program also had the highest percentage of responses on a number of variables, indicative of how much

better established that program is compared to other state promotional programs, and also representative of other findings (Govindasamy et. al, 1999; Onken & Bernard, 2010).

Extension personnel, government agencies and associations, and retailers selling fresh produce and value-added processed items branded by a state promotional program in the mid-Atlantic should be advised of the potential differences in how far their campaigns reach between rural versus urban consumers. Marketing efforts and/or public education initiatives should therefore be more heavily concentrated in urban areas, as compared to more rural areas, where the promotional programs may already be relatively well known. Consumers who are unaware of these programs and products branded by these programs, but are interested in purchasing locally/state produced items, may be encouraged to purchase if they are educated about these programs and products.

Those looking to incorporate new marketing strategies, educational programs, and/or promoting the sale of items branded by state promotional programs should also take into account that preferences and purchasing behavior for items branded by a state promotional program may vary within different urban markets in the mid-Atlantic. While results from this study can be used as a guide for constructing new educational and marketing strategies, these should nonetheless be tailored to consumers residing in targeted local areas.

References

Carpio, C. and O. Isengildina-Massa. 2009. Consumer Willingness to Pay for Locally Grown Products: The Case of South Carolina. Agribusiness, 25(3), 412-426.

Carpio, C and O. Isengildina-Massa. 2010. To Fund or Not to Fund: Assessment of the Potential Impact of a Regional Promotion Campaign. Journal of Agricultural and Resource Economics, 35, 245-260.

Darby, K, Batte, M., Ernst, S., and B. Roe. 2008. Decomposing Local: A Conjoint Analysis of Locally Produced Foods. American Journal of Agricultural Economics, 90(2), 476-486.

Giraud, K., Bond, C., and J. Bond. 2005. Consumer Preferences for Locally Made Specialty Value-added Food Products Across Northern New England. Agricultural and Resource Economics Review, 34(2), 204-216.

Govindasamy, R., Italia, J, and A. Adelaja. 2002. Farmers' Markets: Consumer Trends, Preferences, and Characteristics. Journal of Extension [On-line], 40(1) Article 1RIB6. Retrieved from: <http://www.joe.org/joe/2002february/rb6.php>.

Jekanowski, M., Williams, D., and W. Schiek. 2000. Consumers' Willingness to Purchase Locally Produced Agricultural Products: An Analysis of an Indiana Survey. Agricultural and Resource Economics Review, 29(8), 43-53.

Loureiro, M. and S. Hine. 2002. Discovering Niche Markets: A Comparison of Consumer Willingness to Pay for Local (Colorado-Grown), Organic, and GMO-Free Products. Journal of Agricultural and Applied Economics, 34(3), 477-487.

Onken, K.A., and J. Bernard. 2010. Catching the "Local" Bug: A Look at State Agricultural Marketing Programs. Choices, 25(1).

Patterson, P., Olofsson, H., Richards, T. and S. Sass. 1999. An Empirical Analysis of State Agricultural Product Promotions: A Case Study on Arizona Grown. Agribusiness, 15(2), 179-196.

Patterson, Paul and S. Martinez. 2004. State and Origin Branding in Hispanic Food Markets. Journal of Food Distribution Research 35(3), 7-18.

CHAPTER 6.

CONCLUSIONS

Summary

This research was conducted to investigate consumer attitudes, behavior, and knowledge pertaining to fresh fruits and vegetables and value-added processed products within the mid-Atlantic U.S. region to provide useful insight about current specialty crop industry trends. In general, the majority of survey participants residing within major metropolitan areas of the mid-Atlantic expressed preferences for purchasing locally and/or mid-Atlantic grown produce, certified organic produce, and those purchased direct from farmers over produce that do not have these characteristics. Although consumer attitudes and purchasing behaviors were positive, consumer awareness was low regarding the types and availability of these products, as well as programs promoting these goods.

Specifically, results in Chapter Two indicated that the majority of consumers within the mid-Atlantic region purchase locally grown produce and shop at local venues, such as farmers' markets, to purchase this produce and other locally produced value-added processed products. In Chapter Three analysis suggested that while consumers exhibited preferences for both locally grown and/or certified organic produce over produce that was neither locally grown nor certified organic, their preference for locally grown was stronger than that for certified organic. In Chapter Four, results showed that consumers purchased a large variety of fruits and vegetables (22 on average, of the 32 items participants were asked to indicate if they purchased), most of which can be grown in this region. However, most respondents were neither able to identify what items could be grown in the mid-Atlantic region nor when they were seasonally available for purchase. Lastly, data from Chapter Five revealed that most mid-Atlantic consumers were unaware that their state or other states within the region have promotional programs

supporting the sale of regional produce and value-added processed products. However, those who stated that they were aware of their state's program exhibited preferences for state branded produce and value-added processed products over those that were not branded by the program.

Trends in preferences and purchasing behavior for mid-Atlantic specialty crops and products among certain consumer segments were also found across survey data presented in Chapters Two through Five. Survey participants residing in metropolitan Philadelphia, compared to residents of other metropolitan areas, exhibited the greatest level of preferences, purchasing behavior and concern for locally grown produce and value-added processed products. This was also true for middle-aged and older participants (groups including ages 37 and older) as compared to participants ages 21 to 36 (across sub-categories). Additionally, White/Anglo participants consistently expressed these interests for locally grown products compared to other ethnic groups, and more often to those describing themselves as Black/African Americans.

A trend for organically grown produce was also exhibited in the results. In contrast to consumer segments who favored locally grown, consumers who tended to favor organic over their counterparts were those who showed significantly less favor towards locally grown. Among those who favored certified organic produce were survey participants ages 21 to 36 (across sub-categories), as compared to participants of older age groups (groups including ages 37 and older). Additionally, Black/African, Asian American, and Hispanic American participants favored certified organic over White/Anglo participants. Females also consistently favored organic over males, as well as participants who had children living in their household compared to those who did not.

Research Implications

Overall, research results indicate many opportunities for mid-Atlantic specialty crop industry stakeholders. However, if the industry is to meet consumer demand and encourage purchasing of specialty crops and food products, consumers need to be made aware of what types of items they can purchase from within the mid-Atlantic, and when and where these items are available to purchase. Educating consumers can assist them in learning about and purchasing these items from growers and retailers who market or sell them. For example, extension personnel and/or local vendors could develop educational and promotional materials that inform the public about what types of produce are available during each month of the local growing season and where the items can be purchased. Other stakeholders, such as government organizations, can increase marketing efforts pertaining to their state promotional programs and focus on informing consumers about these programs and where consumers can purchase branded product.

This information can also assist growers, producers, distributors, and retailers with meeting consumer demand for specialty crops, as results indicate the number of consumers interested in purchasing these products and what proportion of them already do so. Results may also help these stakeholders determine which consumer segment(s) they should target based on consumer needs and wants. For example, a retailer interested in attracting consumers who purchase organic produce and value-added processed products, and who based on this research have children in the household, could develop product displays, and/or signage that discuss potential benefits of including organic food in a child's diet.

Stakeholders looking to incorporate these research efforts should also keep in mind that not all consumers will respond in the same manner, and that consumers living in other metropolitan areas may not respond in the same manner as those who reside in the mid-Atlantic U.S. region, as demands and motivations for purchasing specialty crops and value-added processed products may differ. However, research based on primary data provides insight into potential consumer demand, knowledge, attitudes, and behaviors that stakeholders can use as the basis for tailored marketing and educational programs.

Suggestions for Future Research

Though this research focused on consumers residing in major metropolitan areas within the U.S. mid-Atlantic region there is a need to investigate demand, attitudes, and behaviors of primary food shoppers who reside in more suburban and rural areas. These consumers may have different preferences and levels of awareness of produce origin and seasonal availability. Consumers residing in less urban areas may have greater access and exposure to specialty crops and food products, either living nearby these farms or venues selling these products. Additionally, consumers in more rural areas are more likely than urban consumers to have come from farming backgrounds or have farming experience themselves. Future research should examine responses from all three consumer segments to detect potential differences and if marketing efforts or extension education programs initiated by industry stakeholders should differ based on type of community.

Additionally, because studies were conducted over a two-year period and participants were recruited randomly for each of the four surveys, having the option to

maintain the same sample across multiple surveys would better indicate changing attitudes and purchasing behavior within consumer groups over time. Lastly, research concerning the trends examined in this study and any others applicable to the mid-Atlantic fruit and vegetables industries can also be revisited in the future to determine the effectiveness of any programs implemented based upon the current data.