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FACTORS AFFECTING PURCHASE OF LOCALLY GROWN PRODUCE: A CASE STUDY  
OF NEW HAMPSHIRE MARKETS

BY

JORDAN P. STRATER

B.S. Environmental and Resource Economics, University of New Hampshire, 2019

THESIS

Submitted to the University of New Hampshire in Partial Fulfillment of the Degree  
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in

Natural Resources

May, 2021

This thesis/dissertation has been examined and approved in partial fulfillment of the requirements for the degree of Master's of Science in Natural Resources by:

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DEDICATION

To my family  
For all their love and support

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## Table of Contents

<b>LIST OF TABLES</b> .....	<b>vii</b>
<b>LIST OF FIGURES</b> .....	<b>viii</b>
<b>ABSTRACT</b> .....	<b>ix</b>
<b>I. CHAPTER I</b>	
<b>Introduction</b> .....	<b>1</b>
Purpose .....	1
Organic Versus Local .....	1
The Growth of Local Agriculture in the U.S. ....	2
Economic Benefits of Local Agriculture .....	4
Agriculture in New Hampshire .....	5
Current Initiatives and Policies Supporting Local Agriculture .....	6
The Role of Consumers in Local Agriculture .....	7
<b>Research Objectives and Approach</b> .....	<b>8</b>
Research Impacts .....	9
Overview .....	10
<b>II. CHAPTER II</b>	
<b>Literature Review</b> .....	<b>11</b>
Early Research on Local Food .....	11
Recent Studies .....	15
Definition of “Locally Grown” .....	18
Consumer Preferences .....	19
Consumer Characteristics and Attitudes .....	20
Purchase Location .....	21
Willingness-to-Pay (WTP) .....	22
<b>III. CHAPTER III</b>	
<b>Methods</b> .....	<b>24</b>
Methods Introduction .....	24
Focus Groups with New Hampshire Consumers .....	24
Consumer Focus Groups: Data Analysis .....	27
Survey Design .....	27
Conceptual Model .....	31
Logistic Model and Variable Definitions .....	33
<b>IV. CHAPTER IV</b>	
<b>Qualitative Results</b> .....	<b>36</b>
Introduction to Qualitative Results .....	36
Focus Group Results .....	36
Introduction to Consumer Survey Results .....	40
Consumer Survey Demographics .....	40
General Shopping Habits .....	43
Attitudes and Opinions Regarding Local Produce .....	44
Local Produce Purchasing Habits .....	48
Willingness to Pay for Local Produce .....	55

The Effect of COVID-19 on Local Produce Purchasing .....	57
<b>V. CHAPTER V</b>	
<b>Quantitative Results</b> .....	<b>61</b>
Introduction to Quantitative Results .....	61
Logit Model Results .....	61
Predicted Probabilities .....	70
Summary of Quantitative Results .....	71
<b>VI. CHAPTER VI</b>	
<b>Discussion</b> .....	<b>73</b>
Discussion Introduction .....	73
The Local Produce Consumer .....	73
Perceptions of Local Produce .....	75
Why do New Hampshire Consumers Buy Local Produce? .....	76
Barriers to Purchasing Local Produce .....	77
Information on Local Produce .....	78
Discussion of Quantitative Results .....	79
Recommendations .....	82
Limitations of This Research .....	84
Concluding Statements .....	85
<b>REFERENCES</b> .....	<b>87</b>
<b>APPENDIX A. IRB Focus Group Approval Letter</b> .....	<b>91</b>
<b>APPENDIX B. NVivo Codebook</b> .....	<b>92</b>
<b>APPENDIX C. IRB Request for Modification Approval Letter</b> .....	<b>93</b>
<b>APPENDIX D. New Hampshire Consumer Survey</b> .....	<b>94</b>

## LIST OF TABLES

Table 1. Variable Definitions .....	35
Table 2. Consumer Survey Demographics .....	42
Table 3. Factors Determining Food Shopping Location .....	44
Table 4. Sources of Local Produce .....	51
Table 5. Factors Determining Purchasing of Local Produce .....	53
Table 6. Methods of Acquiring Information on Local Produce .....	55
Table 7. Changes to Food Shopping Habits Due to COVID-19 .....	58
Table 8. Reasons for Decrease in Local Produce Purchasing Due to COVID-19 .....	60
Table 9. Summary Statistics .....	62
Table 10. Model 1 Statistics, Estimated Coefficients, p-values, and Odds Ratios of the Independent Variables.....	64
Table 11. Model 2 Statistics, Estimated Coefficients, p-values, and Odds Ratios of the Independent Variables .....	65
Table 12. Model 3 Statistics, Estimated Coefficients, p-values, and Odds Ratios of the Independent Variables .....	66
Table 13. Cross-Tabulation of Buylocal1 and Buylocal2 by Education .....	70
Table 14. Predicted Probabilities .....	71



## LIST OF FIGURES

Figure 1. Number of Food Shopping Locations and Number of Weekly Food Shopping Trips .....	43
Figure 2. Comparison of Local Produce to Non-Local Produce .....	47
Figure 3. Comparison of Consumer Levels of Concern .....	48
Figure 4. Amount of Local Produce Purchased During Winter Months and the Rest of the Year .....	50
Figure 5. Amount of Local Produce Consumed by Source .....	52
Figure 6. Barriers to Purchasing Local Produce .....	54
Figure 7. Willingness to Pay for Different Types of Local Produce .....	56
Figure 8. Percentage of Consumers Reporting Changes to Food Shopping Habits Due to COVID-19 .....	58
Figure 9. Change in the Quantity of Local Produce Purchased Due to COVID-19 .....	59

## ABSTRACT

Factors Affecting Purchase of Locally Grown Produce: A Case Study of New Hampshire Markets

By

Jordan Strater

University of New Hampshire, May 2021

There has been a recent focus on expanding local agriculture production in New Hampshire, and more information on consumer decision making in regard to local food purchasing is needed. Expansion of local food production and consumption has been of great interest in the past several years, with many consumers becoming increasingly curious about where their food comes from. Concerns about disease, environmental damage, fossil fuel usage, and recently food chain disruption due to COVID-19 as well as the health of local economies have fostered this awareness about the origins of our food (Onozaka et al. 2010; Thilmany et al. 2020). This thesis uses results from focus groups consisting of New Hampshire residents to inform a state-wide survey on consumer behavior, attitudes, and characteristics relating to local produce. Results are used to identify factors that influence consumption of local produce. For the purpose of this study, “local produce” is defined as any fruit or vegetable grown in the New England region.

The qualitative results indicate that the average consumer of local produce is older, has a higher income, and has more formal education than the average New Hampshire resident. Additionally, there is correlation between social capital-related factors and increased purchasing of local produce. Consumers who value supporting local business and purchase local produce due to the sense of community surrounding it have a higher probability of purchasing significant

amounts of their produce locally compared to consumers who do not value these attributes. The effects of only two explanatory variables proved to be statistically significant in the binary regression model, representing the amount of local produce purchased during the winter months, and variety as a factor for determining food shopping location. The combination of the qualitative and quantitative results allow for a better understanding of what factors drive local produce purchasing among New Hampshire residents.

## Chapter I

### Introduction

#### *Purpose*

The purpose of this study is to identify the factors that influence New Hampshire consumers to purchase local produce and identify policy recommendations to increase the amount purchased within the state. This project will extend the work of Pyburn et al. (2016), Werner et al. (2019), and McLeod and Halstead (2020) which examined both supply and demand sides of local produce markets in northern New England, including the role of restaurants. Using a similar survey to that of Werner et al. (2019), we will investigate consumers' purchasing habits and values to identify which factors influence the decision to purchase local produce.

This project will define "local produce" as fruits and vegetables grown within New England. This study takes an empirical approach to identify which variables contribute to the likelihood that a New Hampshire consumer will purchase local produce. Respondents to the survey will be divided into two groups, those who purchase a certain amount of their produce locally and those that purchase below that amount of their produce locally. Three different thresholds will be used to determine if there are differences between consumers who purchase different amounts of their produce locally.

#### *Organic Versus Local*

Compared to organic foods, local foods do not benefit from a concrete definition nor do they have a certified labeling program. The United States Department of Agriculture (USDA) adopted federal organic standards in October of 2002, known as The Organic Food Production Act. These standards define the minimum production, processing, and input standards that must be met in order for food to have the organic label. The public demand for organic produce

combined with high price premiums attracted large agribusinesses into the market. In 2006, the annual growth rate for organic sales was 20.9% (Organic Trade Association, 2007). However, due to the establishment of the USDA guidelines, which favored corporate agribusiness rather than small farmers, many in the organic movement were disappointed with the direction organic food was taking. Joan Dye Gussow, a professor and food policy expert, stated “When we said organic we meant local. We meant healthful. We meant being true to the ecologies of regions. We meant mutually respectful growers and eaters. We meant social justice and community” (Hart, 2006). This industrialization of organic foods caused consumers to turn to local foods as a more sustainable and authentic substitute for organic foods. Several studies have found that consumers perceive local foods to be better for society than organic foods (Gallons et al., 1997; Zumwalt, 2001), and supporting local farmers ranked much higher than organic in terms of important attributes to consumers (Zumwalt, 2001; Kezis et al., 1998; Ross et al., 1999; Jekanowski et al., 2000). However, there is still a great deal of confusion and misinformation relating to local food and its differences from organic food. Bodini and Naspetti (2008) found that in some cases local and organic foods are direct substitutes for each other, while in other cases they are complementary. Consumers who infrequently buy organic products are more likely to confuse the terms organic and local, often thinking they are the same. Many consumers buy organic food because they believe it supports the local economy, which is rarely the case (Hughner et al., 2007). Much of this confusion can likely be attributed to the lack of a definition of the term local food.

### *The Growth of Local Agriculture in the U.S.*

In recent years, there has been a growing desire among consumers to know where their food is grown. Concerns about disease, environmental damage, and fossil fuel usage have

fostered this focus on the origins of our food. The overall trends of foodborne illnesses in the United States show a decrease in incidence after the implementation of the 1995 USDA Pathogen Reduction: Hazard Analysis and Critical Control Point (HAACP) System regulations, however there has been a leveling off of incidence since (Morris, 2011). A 2011 study from the Center for Disease Control (CDC) estimates that there are 9.4 million episodes of foodborne illness per year, with 55,961 hospitalizations and 1,351 deaths annually. Onozaka et al. (2010) found that 60% of survey respondents felt that locally grown produce had superior levels of food safety compared to conventional produce. Increased media attention on U.S. agriculture has also contributed to the increase in demand for local and organic products. *Supersize Me* (2004) was one of the first mainstream documentaries to encourage awareness about the food we eat. Other documentaries such as *King Corn* (2007) and *Food, Inc.* (2008), which highlight the controversial aspects of conventional farming, have caused an increase in social awareness and a change in how consumers perceive local foods. This is reflected in rising sales of local foods via direct-to-consumer and intermediated market channels, which increased from \$6.1 billion in 2012 (Low et al., 2015) to \$8.7 billion in 2015 (National Agricultural Statistics Service, 2016).

The 2012 USDA Census found that consumers accounted for 35% of direct sales in 2015, including sales through farmers markets, onsite farm stores, roadside stands, Community Supported Agriculture (CSA) arrangements, online sales, pick-your-own operations, and mobile markets. Retailers, such as supermarkets and restaurants, accounted for 27% of direct sales, and institutions and intermediary businesses such as schools and universities accounted for the remaining 39%. The USDA National Farmers Market Directory reported 8,140 operating farmers markets in 2019, an increase of 203% from the 2,683 markets registered in 2000 (USDA, 2015-2020). The number of regional food hubs, which connect farmers with buyers for their

products by offering production, distribution, and marketing services, increased by 288% between 2007 and 2014 to a total of 302 (Low et al., 2015). This increase may represent growing economies of scale within local food systems, as the services regional food hubs offer provide midsized farmers scale-appropriate markets and smaller farmers the opportunity to increase local food sales without increasing time spent on marketing activities. Studies have found that, regardless of size, farms are more likely to survive if they have local food sales as part of their marketing portfolio (USDA, 2015; McFadden et al., 2018).

### *Economic Benefits of Local Agriculture*

Local agriculture has significant economic impacts, which are particularly great within local economies. The most direct way local food systems can benefit local economies is through import substitution. Swenson (2009) states that when consumers purchase local food rather than imported food, there is an increased economic impact because local workers and business spend additional income on inputs or other local products, otherwise known as multiplier effects. Local food producers also spend more on labor and other variable costs than nonlocal producers. As scale of production increases, so does labor's share of variable cost. This implies local food stimulates proportionally larger spillover impacts on the economy than nonlocal production (Shideler, 2018). Swenson (2009) found that net farm and regional income gains from substituting locally grown produce for imported produce in Southeast Iowa totaled nearly \$1 million for a bundle of 22 produce items. Otto and Varner (2005) estimate that for every dollar spent at a farmers market, 58 cents in indirect and induced sales is generated and for every dollar of personal income earned an additional 47 cents in indirect and induced income is generated. In addition, multiplier effects for farmers market jobs ranging from 1.41 to 1.78 have been reported (Otto and Varner, 2005; Henneberry et al., 2009), meaning each full-time

equivalent job at a farmers market supported around half of a full-time equivalent job in other sectors. Other community benefits resulting from local food production can have positive economic impacts as well, such as increased agritourism, higher local quality of life, fostering of an entrepreneurial environment, and regional branding opportunities (Hughes & Boys, 2015).

### *Agriculture in New Hampshire*

Roughly 4,100 farms operate in the state of New Hampshire as of 2020, covering over 430,000 acres. Greenhouse and nursery products and milk and dairy products are the state's top commodities, followed by apples, vegetables and sweet corn, and maple products (National Agricultural Statistics Service). The 2012 Agricultural Census showed the state was first in the nation for direct marketing sales and organic sales as a percentage of all farm sales, as well as second in the nation for percentage of all farms that have direct sales. The 2017 Census of Agriculture recorded that the market value of agriculture products sold that year was \$187.8 million, while the per farm average was \$45,548. A majority of farms in the state are small, with only 150 farms operating on 500 or more acres. The largest number of farmers are between the ages of 35 and 64, and just over 50% of farmers are over the age of 65. Of all the farms in New Hampshire, 97% are family farms and just 24% hire outside labor. Werner et al. (2019) found the most prevalent constraints for local farming operations in northern New England, including New Hampshire, are related to labor and laborers. This includes difficulty finding employees willing to work for low pay and only for the short season. Farm expansion is most restricted by capital constraints, such as the additional capital needed for increasing inputs, infrastructure changes, taxes, and insurance.



### *Current Initiatives and Policies Supporting Local Agriculture*

Several major state and federal policies exist that support local agriculture, with the most notable being the United States farm bills. Farm bills are passed roughly every five years, the most recent being the Agriculture Improvement Act of 2018 (2018 Farm Bill, Pub.L. 115-334). The most notable success for local food systems in the newest farm bill is known as the Local Agriculture Market Program (LAMP) which will be jointly administered by the USDA's Agriculture Marketing Service (AMS) and Rural Business Cooperative Service (RBCS). LAMP combines two existing programs, the Farmers Market and Local Food Promotion Program (FMLFPP) and the Value-Added Producers Grant Program (VAPG). The combination of these two programs under LAMP ensures they have permanent, mandatory funding in the amount of \$50 million per year. The two programs focus on projects that benefit small and mid-sized farms, as well as domestic farmers markets, roadside stands, community-supported agriculture programs, agritourism activities, and other direct to consumer marketing practices. LAMP also includes financial assistance for expenses relating to costs incurred in obtaining food safety certification, as well as upgrades to practices and equipment to improve food safety (National Sustainable Agriculture Coalition).

A number of initiatives supporting local agriculture also exist at the state level. Food Solutions New England is a regional network that created the *New England Food Vision*, a set of goals designed to increase the New England region's ability to produce its own food to 50% and increase the amount of food-producing land to 15% by 2060. The vision calls for a number of policy changes to support these goals, including redirection of agricultural subsidies, increasing access to healthy food for low-income families, increasing protection for forests and farmland, and stronger environmental regulations (Donahue et al., 2014). Local Foods Plymouth (LFP) is a

year-round online farmers market serving the Plymouth, NH area. They offer any products or foods made or grown in the area on their website, which can be purchased online for pickup or local delivery. Multiple items from different farms can be ordered at once, making this a convenient option for those wanting to patronize local farmers but may not know where to find them.

New Hampshire's 2014 Farm to Plate Law (SB 141) is the state's first policy to support farm-to-table, and aims to

Encourage and support local food producers, farming, and fisheries, including businesses engaged in agriculture, the raising and care of livestock, dairy, fishing, foraging, and aquaculture, agritourism, horticulture, orchard management, maple syrup production and the associated local and regional businesses that process, purchase, distribute, and sell such food throughout the state (Sec 425:2-a).

The law encourages collaboration between state, public, and private entities to expand local food systems. It calls for increased access to local, healthy food to address the social and environmental issues relating to food that NH residents face. While the law does not have any direct action plans within it, it does call for local governments to consider its policies and principles to the fullest extent when adopting new local laws and enforcing current laws and regulations.

### *The Role of Consumers in Local Agriculture*

Despite the growing popularity of local food in the United States, the industry is still in its juvenile stages. Misinformation and lack of information present large barriers to consumption, as well as the lack of formal policies and large-scale promotion of local food. In order to strengthen and grow local agriculture, consumers need to choose to buy more of their food

locally rather than purchasing imported food. If consumers are already buying produce, what will get them to buy that same produce with the local attribute? In order to answer this question, the motivations behind purchasing local produce versus non-local need to be explored. By identifying the factors that influence consumers to purchase local produce and reasons that may prevent purchasing, changes can be made that will increase consumption. Policy-relevant variables can be addressed, and marketing strategies can be implemented or improved upon. This research will answer the question “how do we get consumers to buy more local produce?”

### **Research Objectives and Approach**

This research aims to gain an empirical understanding of the factors that influence a New Hampshire consumer’s decision to purchase local produce and increase the quantity purchased within the state. The research goals of this thesis are as follows:

1. Identify the factors that influence New Hampshire consumers’ decision to purchase local produce using binary logit analysis
2. Understand consumer attitudes and misinformation about local produce
3. Propose policy recommendations and other strategies to increase the amount of local produce purchased within the state of New Hampshire

To address the research goals, this thesis will use a survey of New Hampshire residents informed by focus groups and a literature review. The focus groups will gather insight on consumer characteristics and attitudes, and identify factors that may influence consumption of local produce. The survey will consist of four major sections. Section A will address the respondent’s current food purchasing habits. Section B will ask respondents about their local produce purchasing habits and gather their perceptions on local produce. This section will also contain questions regarding the COVID-19 pandemic and if it has affected shopping habits and

local produce consumption. Section C will contain questions from which willingness to pay estimates can be derived. Respondents will be asked to choose a premium they would pay for five different types of produce. Finally, Section D will investigate demographic data which will provide an understanding of underlying factors that may influence consumption of local produce. Results of the survey will be analyzed using a binary logit analysis model with the dependent variable being whether or not a New Hampshire consumer purchases a certain amount of their produce locally. This approach will identify which factors significantly impact the decision to purchase local produce, and be used to make policy and marketing recommendations to increase consumption of local produce in New Hampshire.

### *Research Impacts*

This research will help stakeholders develop a better understanding of consumer decision making regarding purchasing of local produce in New Hampshire. This information can be used to increase market efficiency and reduce the amount of local produce exported from the state. The focus groups will reveal consumer attitudes, and the state-wide survey will identify the specific factors that positively and negatively affect a consumer's decision to purchase local produce. Identifying these factors can help inform policy and marketing recommendations, several of which are provided in this thesis.

Overall, the logistic regression results will identify the significant factors that affect New Hampshire consumers' decision to purchase local produce. This research extends previous literature by furthering the discussion of potential solutions to increasing the amount of local produce purchased within the state based on the model.

## *Overview*

This thesis will be comprised of four additional chapters. Chapter II will summarize the past studies this work expands upon with a focus on their methods, as well as a comprehensive literature review. Chapter III explains the methods, focus group and survey design, and the conceptual model used in this research. Chapter IV will provide the results of the focus groups and survey, followed by discussion of the results in Chapter V. This final chapter will also introduce policy recommendations aimed at increasing consumption of local produce in New Hampshire and suggestions for further research. The findings presented in this thesis will aim to lower the amount of produce imported and exported in the state of New Hampshire and strengthen the state's market for local produce.

## Chapter II

### Literature Review

#### *Early Research on Local Food*

Local food was not a heavily researched topic until the past decade or so. Since 2010, several USDA agencies have begun research into all aspects of local food systems, beginning with a 2010 report written by the Economic Research Service (ERS). This report, entitled *Local Food Systems: Concepts, Impacts, and Issues*, served as an introduction into many aspects of local food systems. The report included discussion about the definition of the term “local”, market size and reach estimates, characteristics of local food consumers and producers, and the economic and health impacts of local food systems. The study found there was no widely accepted definition of the term “local”. It was also confirmed that the contribution of local food markets to total U.S. agricultural sales was growing, with direct-to-consumer sales increasing from \$551 million in 2007 to \$1.2 billion in 2007. There was a 92% increase in the number of farmers markets from 1998 to 2009, and another major increase in the number of community supported agriculture (CSA) operations. There were just two recorded CSA operations in 1986, but by 2005 there were 1,144. The study determined that most farms selling directly to consumers were small, making less than \$50,000 per year in total farm sales. Barriers to local food-market entry and expansion were determined to mainly include capacity constraints and lack of distribution systems; limited research, education, and training for marketing local food; and uncertainties relating to regulations that could affect local food production. This study also published some of the first willingness-to-pay (WTP) estimates for locally produced food. It was determined that consumers valuing high-quality foods produced with a lower environmental impact are willing to pay more for locally produced food. Summarizing the few studies on the

impacts of local food at the time, the authors stated existing research found that expanding local food systems in a community can increase employment in that community, however existing research was insufficient to determine whether the availability of local food improves diet quality or food security. Life-cycle assessments suggested local food can reduce energy use and greenhouse gas emissions, but not that it always does. Overall, the study was meant to serve as a comprehensive overview of the understanding of local food systems at the time, and came about due to the increasing demand for food that is locally produced, marketed, and consumed. This increase in demand for local food prompted the USDA to conduct numerous studies in the following years.

Another major ERS report came in 2015, entitled *Trends in U.S. Local and Regional Food Systems*. This report was congressionally mandated, and was written as part of the Fiscal Year 2014 Appropriations Bill. It served as an overview of local and regional food systems at the time, detailing the latest economic information on local food producers, consumers, and policy. The study found that producer participation in local food systems was continuing to grow, and the value of local food sales through both direct-to-consumer (DTC) and intermediate marketing channels appeared to be increasing as well. In 2012, 7.8% of U.S. farms were marketing foods locally, defined by the census of agriculture data as conducting either DTC or intermediated sales of food for human consumption. Of the farms marketing foods locally, 70% were found to only use DTC methods, such as farmers markets and CSA arrangements. At the time, no data source collected information on the value of intermediated sales, so only an estimate of local food sale totals could be given. It was estimated that local food sales totaled \$6.1 billion in 2012. Despite experiencing smaller increases in sales than other farms, farms with DTC sales were more likely to remain in business between 2007 and 2012 than farms not using DTC methods.

The study was unable to come to concrete conclusions regarding the economic impact of local food systems at the time due to limited existing literature and the costly methods of obtaining conducting economic impact analyses. The authors called for future research to explore the economic impact of local food systems further, including whether local food systems are good for rural economies and whether the economic benefits of expanding local food systems are evenly distributed.

The Agricultural Marketing Service (AMS) published a significant document in 2016: *The Economics of Local Food Systems: A Toolkit to Guide Community Discussions, Assessments, and Choices*. The Toolkit is comprised of principles used to assess food systems and economic indicators a community may expect to share, with the goal of guiding and enhancing the capacity of local organizations to better measure local and regional economic activity and additional benefits. Previously, there had not been a standardized approach to evaluate market and economic outcomes of local food systems. The Toolkit allows communities to evaluate the outcomes of leveraging the USDA's new opportunities for the development of local food markets. It also reflects the USDA AMS intentions to expand its role as a provider of technical assistance to food system practitioners, economic developers, and community stakeholders. Along with helping communities better measure expected economic impacts of planned local food activities, the Toolkit also supports more informed policy and regulation-related decision making at the local, State, and Federal levels. The Toolkit is published in the form of seven modules, beginning with a module on how to define the parameters of a local food system. The second module informs readers on how to use secondary data sources, while the third module details how to generate and use primary data. Module four explains how to apply data to specific community settings. The fifth module begins the technical portion of the Toolkit,



and is meant to be utilized by those with advanced economic training. This module explains how to use input-output analysis to estimate linkages and economic impacts of local and regional food systems in local economies. Module six discusses how to address the opportunity costs associated with local food systems. Finally, module seven explains the benefits of using the software program IMPLAN to conduct economic impact studies. Each module contains case studies that provide relevant examples. This Toolkit is one of the only all-encompassing guides to help communities thoughtfully assess and plan expansion of local food systems.

The USDA has also done several studies on the demand for local food, including the demand for local produce. A majority of this work has been done by the ERS. In 2010, the same year the ERS published their first major research on local food systems, two shorter studies were also published. Hand (2010) published a study entitled *Local Food Supply Chains Use Diverse Business Models to Satisfy Demand*, which explored how growing demand for local food affects the supply chains for it. Hand discussed the expanding array of supply chain arrangements occurring to meet the increase in demand for local food, and how meeting increasing demand may mean producers have to balance maintaining their identity and getting information to consumers with product aggregation to access larger markets. He also explained the changing market from a producer perspective; more producers may enter the local food markets in search of a premium for their products. However, increased supply can erode price premiums. Martinez (2010) published a study that same year on what drives demand for local foods. He found consumers of local food valued freshness, supporting the local economy, and knowing the source of the product. Consumers were found to believe local food to be fresher looking and tasting, of higher quality, and a better value for the price. Some associate local food with environmentally sustainable methods of production, fair farm labor practices, and better animal welfare. Some

consumers also believe local foods are synonymous with small farms that are committed to the local community by fostering social and economic relationships. Regarding demand for local produce in particular, Stewart & Dong (2018) found that households buying fruits and vegetables through DTC channels spent more money on these two food groups than households that did not buy from DTC channels. Among households utilizing DTC channels, average weekly fruit and vegetable spending totaled \$28.36, and totaled \$16.53 for households that did not utilize these channels. Factors like education and interest in health and nutrition were closely linked with buying fruits and vegetables at DTC outlets. Households may be willing to pay more when buying directly from producers, and may purchase a greater quantity or variety of fruits and vegetables.

### *Recent Studies*

In this thesis I will expand upon the work of Pyburn et al. (2016), Werner et al. (2019), and McLeod and Halstead (2020). These studies examined both the supply and demand sides of local produce markets in northern New England, including the role of restaurants. The data collection methods used in these three studies inform the methods used in this thesis.

Pyburn et al. (2016) conducted a study that assessed consumers' purchasing habits in regard to local and organic fresh produce in New Hampshire. The study included willingness to pay (WTP) estimates, determination of a consumer's definition of local, consumers' perceptions of local and organic fresh produce, and identification of demographic trends. The study was designed to help growers with their selections of crops and growing techniques, as well as pricing. Data collection followed a two-tiered approach. A focus group of growers in New Hampshire revealed opinions that were used to assist in the formulation of questions for a

consumer survey. Because this study was meant to be the basis for a larger study and due to time restrictions, one focus group was held. The focus group had five grower participants, as well as a facilitator from UNH Cooperative Extension and three members of the research team. The goal of the focus group was to determine what farmers grow, why they grow a particular crop, their feelings towards local and organic agriculture in New Hampshire, and what consumer information they felt would benefit their businesses. Results from the focus group were used to design a choice experiment analysis by way of a consumer survey. The survey was distributed using Qualtrics Research Survey Suite using two filters: The respondent must be 18 years or older and needed to be a resident of New Hampshire. The response rate was 46%. The choice experiment was designed using information from the focus group and a pretest of consumers. Five attributes were chosen to describe the produce using this information along with findings from existing literature. All attributes except for price were binary. The price attribute was given four levels to provide variation across the bundles, with the values reflecting actual price ranges of each product. The study found that age group, income level, or education level were not significant in local purchasing decisions, however respondents who had purchased organic and locally grown produce had higher average incomes than those who do not. This implies a potentially niche market. The authors suggest conducting a larger study across different regions of the state and evaluating the knowledge of New Hampshire residents in regard to farming practices would add another dimension to analyzing purchasing habits.

Werner et al. (2019) conducted a multi-state, multi-year study to assess Northern New England's potential for local agriculture. They looked into four areas: local food capacities, constraints to agricultural expansion, consumer preferences for local and organic produce, and the role of intermediaries as alternative local food outlets. Methods included focus groups,

choice modeling, logistic modeling techniques, and supply and demand estimations. The authors first identified production ceilings at the county level for 51 products in 40 counties. They found many counties do not have enough farmland to meet demand from residents. Vegetable and fruit growers were then interviewed in focus groups to determine current and future expansion restraints. Following this, a consumer survey was distributed to understand demand for locally produced alternatives. The survey was sent to residents of New Hampshire, Maine, and Vermont and included both qualitative and quantitative questions. Qualitative questions inquired as to what consumers value when they purchase produce, and the quantitative portion was a choice experiment that provided dollar estimates of consumers' willingness to pay (WTP) for local and organic produce. Results show high variation in WTP across the region, supporting the idea that the premiums for local produce should be assessed at a state or county level. The demand investigation done in this study reveals a weak and variable WTP for the local attribute. However, most consumers responded in the survey that it is "very important" that their food purchases support maintaining local farmland and the local economy. This may indicate that consumers in the region value the underlying benefits associated with locally grown food, but not the term "local" itself. The authors stated there seems to be a knowledge gap between the benefits of local produce and the term "local" that needs to be filled.

The work of McLeod and Halstead (2020) used primary survey data to identify the potential for increasing intermediate purchase of locally grown food products by restaurants. Data was gathered using an online survey distributed via Qualtrics survey software. Questions were chosen based on previous literature, a pilot study, and collaboration with local restaurant chefs who used local sourcing. Questions for the pilot study were chosen based on interviews with outlets that distributed local food products. Findings show consumers in Northern New

England have a negative propensity to consume produce purchased directly from farms or farmers markets, but had a positive propensity to consume local and organically grown items overall. These results show the need for identifying other ways for consumers to purchase locally grown items rather than only purchasing from a farm directly. The authors propose increasing local sourcing to local food establishments and other intermediate channels may increase a consumer's consumption of local food products by lowering the opportunity cost of purchasing them.

#### *Definition of "Locally Grown"*

The definition of "locally grown" varies greatly. Many consumers define local to be within certain geographical areas, while some define it to mean a political boundary, such as a state border. Others define it based on ethics, community, and other factors that are not directly related to food miles (Adams & Salois, 2010). The U.S. Congress defines locally grown in the 2008 Food, Conservation, and Energy Act as a product that has traveled no more than 400 miles from its origin, however this definition is rarely used by consumers. Typically, distance from home and state boundaries are used by many consumers to define locally grown. Onozaka et al. (2010) found that 70% of U.S. consumers define local as within a 50 mile radius, but over 60% responded that food produced within their state was regional rather than local. Conner et al. (2010) conducted a survey of Michigan consumers and found that 49% define local as grown within the state, 18% as within the Great Lakes region, and 18% as within 100 miles from home. In a survey of southeast Missouri consumers, Brown (2003) found that 37% define local as within the southeast Missouri region, 23% as the southeast Missouri region and the southern Illinois region, 14% as within their county, 14% as their county and a neighboring county, and 12% as within the state of Missouri.

## *Consumer Preferences*

Existing literature shows that the reasons consumers choose to purchase local produce vary. The main factors that have been found to motivate consumers to purchase local produce are freshness and quality, price, environmental concerns, and support for local farms. Most of the research indicates that freshness and quality of the produce are the most important factor to consumers (Brown, 2003; Schneider & Francis, 2005; Bond et al., 2009; Gao et al., 2012; Yu et al., 2017). Consumers who value quality and freshness are more likely to seek out local produce (Brown, 2003; Bond et al., 2009), meaning they shop at farmers markets or purchase directly from farmers. Bond et al. (2009) found that consumers that purchase local products directly from producers all or some of the time put less emphasis on location and aesthetics of the products and have a stronger preference for fresh, unprocessed produce than consumers who never prefer to purchase directly from a producer. A nationwide survey of consumers at farmers markets conducted by Yu et al. (2017) identified fresh produce quality and support of local food systems to be the two most significant predictors of fresh produce purchasing, while opinions about the level of food safety at farmers markets varied among age groups. Millennials had a greater perception of food safety at farmers markets compared to generation X and older generations. A survey of Michigan consumers that shop at farmers markets state that the most important reasons for doing so were food quality, safety from food borne illnesses, and ability to support local farms while the least important factors were availability of pesticide-free and hormone-free food products, as well as ability to do one stop shopping (Conner et al., 2010). In a choice experiment, Darby et al. (2008) found that consumers interviewed at grocery stores clearly discriminated between strawberry growing locations: grown locally, grown in the U.S., and unidentified growing location. Locally grown was distinctly preferred over grown in the U.S., which was

distinctly preferred over the strawberries with an unidentified growing location. Consumers at direct markets, such as farm stores and farmers markets, distinguished only between locally grown and not locally grown. This indicates that consumers at any food shopping location prefer locally grown produce when it is clearly identified as such.

### *Consumer Characteristics and Attitudes*

Several studies have found that demographic factors are not significant or are weak predictors of local purchasing (Bond et al., 2009; Brown, 2003) while others identify a variety of factors as significant. Conner et al. (2010) identified consumers who are white with higher incomes typically place lower importance on factors associated with value and convenience, and Latinx and part-time workers were more likely to value these factors. They also found that the number of adults in the household and if a respondent works part-time were significant demographic variables. Carpio and Isengildina-Massa (2009) identified age and income as factors that influence willingness-to-pay for local products. The results of Racine et al.'s (2013) survey found that white families, lower income families, families living in rural areas, families with children who ate five or more servings of fruits and vegetables per day, and families with children in poor health were all more likely to purchase local produce. They also identified black families as more likely not to purchase local produce than white or Hispanic families, and participation in the Supplemental Nutrition Assistance Program (SNAP) was associated with not purchasing any local produce. Consumers with a high concern for the environment have a 20% greater probability of buying local and organic (Zepeda and Nie, 2012).

Kumar and Smith (2018) conducted a study on the behaviors of local food consumers. They found that consciousness about one's health, concern for the local environment, and concern for the local economy are traits that lead to a positive attitude about local food. They

identified consumers who are more involved with food and seek information are more likely to purchase local food. Bailey (2013) found that 93% of consumers would be interested in purchasing food directly from a local producer. Brown (2003) found that 79% of consumers would look for local products if they had a label stating they were local products. The same survey revealed that 73% of consumers believe that the quality of produce is usually higher at farmers markets, and 43% of consumers believe the price of produce is usually lower when it is purchased directly from farmers as opposed to the grocery store. Conner et al. (2010) identified the ability to better identify locally grown food as the greatest opportunity for increasing local food purchases, while the greatest barrier is lack of availability.

### *Purchase Location*

Consumers purchase their local food using several different methods. The results from the survey conducted by Bailey (2013) showed that 76% of consumers purchase local food from farmers markets, 68% from grocery stores, 42% directly from farmers, and 14% through Community Supported Agriculture (CSA) operations. This survey also found that 85% of consumers want their grocery stores to offer more locally produced food. Onozaka et al. (2010) found that 33% of consumers purchased from farmers markets while 8% purchase directly from the farmer for at least one-quarter of their household's produce. Conner et al. (2010) conducted a survey that found 61% of respondents had visited a farmers market in the past year with an average of four visits in the most recent month. Gao et al. (2012) identified the social amenities provided by farmers markets as potentially more important than their function as a place for money-product exchanges. Many respondents felt farmers markets had a desirable atmosphere (94%) and are a good place for socializing (83%). The results of Schneider and Francis (2005) indicate consumers are interested in buying local foods directly from farmers, farmers markets,



local grocery stores, and local restaurants with the most interest in buying local foods from local grocery stores. 55.1% of consumers responded that they were “very interested” in purchasing local food from local grocery stores, and 14.8% responded that they were “extremely interested.”

### *Willingness-to-Pay (WTP)*

Past studies done on willingness-to-pay (WTP) for local produce vary greatly depending on the area of the country the studies were conducted in. For instance, Carpio and Isengildena-Massa (2009) found 78% of South Carolinians were willing to pay a 5% premium for local produce versus non-local produce while Brown (2003) found that only 16% of Missourians were willing to pay a 5% premium for local produce versus non-local produce. Schneider and Francis (2005) surveyed Nebraska consumers, finding that 34% of consumers were willing to pay a 10% premium for local foods, 1% would pay a 25% premium, and 1% would pay more than a 25% premium. Alternatively, another survey in Nebraska conducted by Bailey (2013) found that 84% of consumers would pay a 10% premium for locally grown food, 34.2% would pay a 20% premium, 10.8% would pay a 30% premium, and 6.2% would pay a premium greater than 30%. Darby et al. (2008) found that consumers were willing to pay nearly twice as much for locally grown strawberries in a choice experiment. Guaranteed freshness of the produce resulted in a stochastic WTP of \$0.54 for shoppers at grocery stores and \$0.73 for shoppers at direct markets. The WTP for the locally grown and guaranteed freshness attributes were similar, suggesting strawberries with labels stating either they were locally grown or guaranteed fresh can support similar price premiums. Among direct market consumers, the WTP for strawberries from a small farm rather than a large, “corporation”-affiliated farm was more than two times larger than that of grocery store shoppers. This part of the choice experiment was based solely on the names

given to the theoretical farms, indicating consumers at direct markets may be more averse to large-scale agriculture operations.

## Chapter III

### Methods

#### *Methods Introduction*

Several methods and analytical tools were used to identify the factors that influence consumer decision making relating to local produce. First, this chapter describes the methods used to gather insight on consumer shopping habits and attitudes towards local produce, consisting of focus groups and qualitative software analysis. This chapter then describes the consumer survey used to identify specific factors that influence purchasing of local produce and to generate willingness to pay estimates for local produce. Finally, this chapter describes the binary logit model used in this thesis in detail, prefaced by an explanation of the conceptual model and followed by a description of the variables. The description of the methods used to answer the thesis research questions, previously described, gives context for interpreting the results presented in Chapter IV.

#### *Focus Groups with New Hampshire Consumers*

To design an effective and relevant survey, two focus groups were held to gather consumers' general thoughts and attitudes toward local produce, and to determine how consumers make certain decisions regarding food shopping. Focus groups have long been used in a wide variety of disciplines, such as sociology, education, politics, and medicine. First used as a market research technique in the 1920's, focus groups have evolved into a data collection technique able to be employed in a range of settings. Widespread interest in focus groups began in the 1980's, when Robert Merton published remarks on his use of "focused interviews" conducted in the 1940's (Morgan, 1996). Merton and his colleagues are often credited with introducing focus

groups. Merton's 1987 publication was soon followed by two book-length treatments of focus group guidelines and pedagogy published by social scientists Krueger (1988) and Morgan (1988) which became the primary texts for focus group research techniques (Morgan, 1996). Focus groups serve as an effective way to collect qualitative data by gathering information from a specific group of individuals speaking from personal experience. This information can be used to identify potential areas of inquiry or to clarify subject matter that may not be found using other qualitative methods (Powell & Single, 1996; Kamberelis & Dimitriadis, 2013). Compared to one-on-one interviews, focus groups enable the researcher to identify the full range of perspectives held by the participants. The nature of focus groups allows participants to clarify or expand upon their statements upon hearing other participants' responses. This expansion on contributions can be left out or underdeveloped in a one-on-one interview (Powell & Single, 1996). Focus groups also avoid the artificiality of other qualitative methods due to the fact they draw on the normal experience of talking amongst family, friends, and colleagues about events or issues in their daily lives (Wilkinson, 1999). As with any other research method, there are some drawbacks associated with the use of focus groups. Interpretation of the results of focus groups is the least agreed upon part of the methodology due to the many ways raw, transcribed information can be analyzed. The particular way a researcher interprets data is often referred to as "experimenter bias." Another criticism of focus groups is that they may only provide superficial information as participants may not be comfortable sharing personal information, though this has been disputed by the use of focus groups to investigate intimate sexual health issues (Powell & Single, 1996). Doubts also exist about the influence the moderator and the "group effect" can have over participants' responses. Despite these potential shortcomings, focus groups offer the best way to collect detailed qualitative information from a variety of people. For

this reason, focus groups were used as the preliminary data collection method to gather New Hampshire consumers' general thoughts and attitudes toward local produce and their decision making regarding food shopping.

The focus groups were originally intended to be held in person, and four to five groups were to be held in different parts of the state. Due to the COVID-19 pandemic, the focus groups could no longer be held in person. The pandemic also greatly limited the ability to recruit a random sample of participants. Recruitment was done using email and Facebook. Participants were required to be New Hampshire residents, over the age of 18, and the primary food shopper for their household. Participants lived in several different areas of the state, and represented a wide range of ages.

The two focus groups were instead held using Zoom videoconferencing software in October of 2020 and had five participants per group. Both focus groups lasted around one hour. A trained facilitator led both sessions, and asked one screening question and five main questions. The screening question ensured that participants were the primary food purchaser for their household. This ensured each participant was able to provide detailed information about their household's food purchasing habits. The following six questions were asked of the participants:

1. How do you decide where you do your food shopping?
2. Why are the traits given in question one important to you?
3. As a percentage, how much of the produce purchased by your household is local?
4. Where do you get information about local produce?
5. What are the benefits of purchasing local produce?
6. What prevents you from purchasing more local produce?

The use of human subjects for this study was approved by the University of New Hampshire Institutional Review Board for the Protection of Human Subjects in Research (IRB) on September 15<sup>th</sup>, 2020 (Appendix A). In accordance with IRB policies, each participant was emailed an informed consent document explaining their rights as a participant in the study, the purpose of the study, participant anonymity, and how the collected data would be used, stored, and analyzed. Participants were required to send an email in response that stated they either agreed or disagreed to participate. All potential participants sent the informed consent document agreed to participate.

#### *Consumer Focus Groups: Data Analysis*

Both focus group sessions were recorded using Zoom's recording feature, and handwritten notes were taken. Transcripts were derived from the recordings using Rev<sup>®</sup> transcription software. These transcripts were then entered into the qualitative software, NVivo, for analysis. The transcripts were coded to reveal themes and the most important topics within each question. Once both transcripts were coded, NVivo was able to identify the most frequently concepts and how many times they were each mentioned. During the coding process, measures were taken to avoid reporting the appearance of a code mentioned multiple times by the same participant. The codebook is provided in Appendix B. Despite the small sample size, the results of the focus groups help to answer the research questions and, more importantly, influence the design of the consumer survey.

#### *Survey Design*

To investigate consumer decision making and attitudes regarding local produce, an online survey was distributed to New Hampshire residents during April of 2021. The survey was built

using Qualtrics survey software. IRB approval was requested in the form of a modification to the original study plan and approval was received on March 10<sup>th</sup>, 2021 (Appendix B). The survey totaled 37 questions (Appendix C) with some questions only appearing to participants if certain criteria were met. Survey questions and design were shaped by previous literature, particularly Werner et al. (2019), and the focus groups. The survey was pre-tested with a group of five individuals to determine the time it took to complete the survey and to test the questions for clarity. Data collection began April 1<sup>st</sup>, 2021 and ended April 6<sup>th</sup>, 2021.

The survey consisted of four sections: Section A, asking about food shopping habits; Section B, asking about local produce knowledge, shopping habits relating to local produce, and the impact of the COVID-19 pandemic on local produce purchasing; Section C, evaluating potential premiums for five different types of local produce; and Section D, which gathered demographic information. Before beginning the survey, potential participants read an informed consent statement explaining their rights as a participant in the study, the purpose of the study, participant anonymity, and how the collected data would be used, stored, and analyzed. They were then required to check a box agreeing to participate in the survey. Participants who selected they did not agree to participate were automatically exited out of the survey. Participants were then required to answer three screening questions verifying they were at least 18 years of age, a New Hampshire resident, and the primary food purchaser for their household. If they answered “no” to any of these three questions, the survey would end. The survey was then broken up for readability purposes, with only one to a few questions appearing at a time.

Section A asked about general food shopping habits. The goal for this section was to gather information on what factors consumers look for when deciding where to do their food shopping and how much time they invest in the activity. Section B contained questions about

local produce, with the aim of identifying the level of knowledge and potential misconceptions consumers have about local produce. This section began with definitions of local and non-local produce. The definition of local produce used for this survey was “any fruit or vegetable grown within the New England (Vermont, Maine, Massachusetts, Connecticut, Rhode Island, and New Hampshire) region.” This definition was chosen because New England’s agriculture industry is extremely interconnected, with many producers selling their products in nearby states. Because of New Hampshire’s small size and position in the middle of the region, this definition was determined to be the easiest to consider compared to using a radius or restricting the definition to produce grown within the state. After defining these important terms, this section asked consumers to compare local and non-local produce based on traits such as freshness, taste, environmental impact, and health benefits. Participants were then asked to state their level of concern regarding use of pesticides, risk of potential food-borne illnesses, and risk of long-term health impacts for local produce, from very concerned to not at all concerned. The next questions asked participants about their purchases of local produce within the past 12 months. If participants had purchased local produce in the past 12 months, they were presented with additional questions about those purchases. This included stating how much of the produce they purchase is local as a percentage, broken down into winter months and the rest of the year. It was determined during the focus groups that New Hampshire residents have a difficult time providing an answer for the entire year due to the seasonality of most produce in the state. If participants had not purchased local produce in the past 12 months or were unsure if they had, they were asked why they hadn’t. Several questions relating to the COVID-19 pandemic were asked, as the potential impact of the pandemic on consumer’s shopping habits could not be



ignored. The final questions in this section related to how consumers find information regarding local produce.

Section C had participants select potential premiums for five different types of produce: beefsteak tomatoes, carrots, snap peas, strawberries, and green beans. For each question, the average price of a non-local option was given. This price was estimated by averaging the price per pound of the produce at three different popular grocery stores in the state. Respondents were then asked to select which premium was the most they would be willing to pay per pound for a local option. The potential premiums were given as prices, starting at 0% (the same price as the non-local option) and increased by 5% increments up to 25%. Two additional choices were given, one stating the respondent would not purchase the local option even at the lowest price provided and one option stating the respondent either doesn't like or doesn't purchase that type of produce. Section D gathered demographic information. A majority of the questions in this section were only shown to respondents if they had never completed a survey as part of the Granite State Panel previously, as the Survey Center stores this data. Information collected in this section expected to impact local produce consumption included number of individuals in the household, and number of individuals under the age of 18. Respondents were also asked for their town of residence, as some counties in the state have more local food programs than others. Questions not originally included in the survey but later added by the Survey Center ask respondents for voting information. This includes registered party and 2020 presidential vote. This information is required to be collected in all Granite State Panel surveys to apply their standard weighting formula and ensure representativeness of the state population. It was expected these questions would only have to be asked to 10% or less of respondents, as most respondents would have provided this information in past surveys.

The survey was sent out to Granite State Panel members, who are recruited from randomly-selected landline and cellphone numbers across New Hampshire. The University of New Hampshire Survey Center uses this panel to investigate new ways of gathering and understanding the opinions of New Hampshire residents. Panel members were also recruited by sending a text message to a random sample of cellphones in the state. Potential members were asked if they wanted to join the panel and to provide an email address. An invitation email was sent to panel members on April 1<sup>st</sup>, 2021 asking them to participate in this survey. Non-responders were sent two reminder emails, and the survey was closed on April 6<sup>th</sup>. The target number of responses was 300. The survey yielded 322 responses, with a response rate of 25%. One observation was removed as an outlier due to their household size of 20 individuals, leaving 321 usable responses ( $n=321$ ). STATA statistical software was used to obtain descriptive statistics and estimate the regression models. The data were weighted by respondent sex, age, education, and region of the state to targets from the most recent American Community Survey (ACS) conducted by the U.S. Census Bureau, as well as party registration levels from the New Hampshire Secretary of State and to 2020 election results in New Hampshire.

### *Conceptual Model*

Binary logistic regression is used to analyze the relationship between a dichotomous dependent variable and one or more independent or explanatory variables. In this research, the dichotomous dependent variable is whether or not an individual purchases a certain amount of their produce locally. This is determined by the use of a threshold percentage. If the amount of produce purchased locally, as a percentage of total produce purchased, is equal to or above the threshold, the dependent variable would be equal to 1. If the amount of produce purchased

locally, as a percentage of total produce purchased, is below the threshold, the dependent variable would be equal to 0. The thresholds used in this research are later defined.

The independent variables can be denoted as

$$X_1, X_2, \dots, X_k$$

Where each  $X$  is an independent variable and  $k$  is the number of independent variables being considered. The independent variables can be quantitative, categorical, or binary (also known as “dummy” variables). To obtain the logistic model, the  $X$ 's can be combined into an index, represented by  $z$ .

Equation 1. 
$$z = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k$$

Where  $\alpha$  and  $\beta_i$  are constants representing unknown parameters (Kleinbaum & Klein, 2010). The index  $z$  is a linear function of the  $X$ 's.

For the logit model, the probability of the  $i$ th decision maker purchasing a percentage of their produce locally that is equal to or above the threshold amount, represented by  $P_i$ , is

Equation 2. 
$$P_i = F(z_i) = e^{z_i} / (1 + e^{z_i}),$$
  

$$-\infty < z_i < \infty, \text{ where } z_i = x'_i \beta.$$

$P_i$  will always be a number between 0 and 1. The change in  $P_i$  with respect to a change in  $x_i$  is given by

Equation 3. 
$$\partial P_i / \partial x_i = (\partial F / \partial z_i) (\partial z_i / \partial x_i) = f(z_i) \beta$$

Where  $f(z_i)$  represents the value of the density function associated with each possible value of the underlying index  $z_i$  (Capps & Kramer, 1985).

### *Logistic Model and Variable Definitions*

The logit model specified to identify the factors that influence a New Hampshire consumer to purchase local produce is as follows:

$$\begin{aligned} \text{Equation 4. } \text{BUYLOCAL} (0, 1) = & \beta_0 + \beta_1 \text{SEX} + \beta_2 \text{AGE} + \beta_3 \text{EDUC} + \beta_4 \text{INCOME} + \\ & \beta_5 \text{HOUSEHOLD SIZE} + \beta_6 \text{MINORS} + \beta_7 \text{COUNTY} + \beta_8 \text{LOCATIONS} + \beta_9 \text{TRIPS} + \beta_{10} + \\ & \beta_{11} \text{CONVEN2} + \beta_{12} \text{TIME2} + \beta_{13} \text{PRICE2} + \beta_{14} \text{VARIETY2} + \beta_{15} \text{BULK2} + \beta_{16} \text{PRE2} + \\ & \beta_{17} \text{LOCALFOOD2} + \beta_{18} \text{ORGAN2} + \beta_{19} \text{LOCALBUS2} + \beta_{20} \text{FAMHEALTH8} + \\ & \beta_{21} \text{QUALITY8} + \beta_{22} \text{TASTE8} + \beta_{23} \text{SUPPLOCAL8} + \beta_{24} \text{KNOWFARMER8} + \\ & \beta_{25} \text{COMMUNITY8} + \beta_{26} \text{FOODSAFE8} + \beta_{27} \text{ENVCONCERN8} + \epsilon \end{aligned}$$

The dependent variable for the model represents  $y=1$  when the amount of local produce purchased by the respondent is within or above the threshold bracket, and  $y=0$  when the amount of local produce purchased by the respondent is below the bracket. Respondents were asked if they had purchased any local produce in the past 12 months. If they had, they were asked what percentage of the produce purchased by their household was local produce on a scale of 1-10%, 11-20%, 21-30%, 31-40%, 41-50%, 51-60%, 61-70%, 71-80%, 81-90%, and 91-100%.

Respondents provided two answers, one for the winter months and one for the rest of the year. In order to reduce the effect of seasonality on the availability of local produce, the dependent variable is only the amount of local produce purchased during the rest of the year. The threshold brackets of 31-40%, 41-50%, and 51-60% were used to run the model three times. The explanatory variables were chosen based on the previous literature and results from the focus groups.

The 27 explanatory variables include respondent demographics, food shopping habits, factors the respondent considers when deciding where to do their food shopping, and reasons

why the respondent chooses to purchase local produce. For the latter two groups of variables, the information was gathered in the form of two questions with the ability for the respondent to select multiple answers. Each possible answer was then turned into its own dummy variable, with the variable coded as 1 if the respondent chose that answer and 0 if they did not. The number at the end of the variable name denotes which question it goes with; variables ending in a 2 are from question two, asking respondents about the factors that help determine where they do their food shopping, and variables ending in an 8 are from question 8, asking respondents the reasons they purchased local produce.

The variables are further defined in Table 1.

Table 1. Variable Definitions

VARIABLE	DEFINITION
BUYLOCAL	Coded 1 when amount of local produce purchased is within or above the given threshold bracket, 0 if the amount is below the threshold bracket
BUYLOCAL1	At least 31% of total produce purchased is local
BUYLOCAL2	At least 41% of total produce purchased is local
BUYLOCAL3	At least 51% of total produce purchased is local
SEX	Coded 0 for male, 1 for female
AGE	Respondent's age in years
EDUC	Respondent's level of education – high school graduate/GED (coded 0), technical school/certificate program (coded 1), some college (coded 2), 2-year degree (coded 3), 4-year degree (coded 4), graduate degree (coded 5)
INCOME	Respondent's household income before taxes in 2020 – less than \$15,000 (coded 0), \$15,000-\$29,999 (coded 1), \$30,000-\$44,999 (coded 2), \$45,000-\$59,999 (coded 3), \$60,000-\$74,999 (coded 4), \$75,000-\$89,999 (coded 5), \$90,000-\$104,999 (coded 6), \$105,000 or more (coded 7)
HOUSEHOLDSIZE	Number of individuals in respondent's household, including themselves
MINORS	Number of individuals under the age of 18 in respondent's household
COUNTY	Belknap (coded 0), Carroll (coded 1), Cheshire (coded 2), Coos (coded 3), Grafton (coded 4), Hillsborough (coded 5), Merrimack (coded 6), Rockingham (coded 7), Strafford (coded 8), Sullivan (coded 9)
LOCATIONS	Number of locations respondent frequents for their food shopping – one (coded 0), two (coded 1), three (coded 2), more than three (coded 3)
TRIPS	Number of times respondent goes food shopping per week – once (coded 0), twice (coded 1), three times (coded 2), four or more times (coded 3)
WINTERPURCHASE	Amount of local produce respondent purchases in the winter months – 1-10% (coded 0), 11-20% (coded 1), 21-30% (coded 2), 31-40% (coded 3), 41-50% (coded 4), 51-60% (coded 5), 61-70% (coded 6), 71-80% (coded 7), 81-90% (coded 8), 91-100% (coded 9)
CONVEN2	Convenience – coded 1 if selected, 0 if not selected
TIME2	Time – coded 1 if selected, 0 if not selected
PRICE2	Price – coded 1 if selected, 0 if not selected
VARIETY2	Variety – coded 1 if selected, 0 if not selected
BULK2	Availability of bulk items – coded 1 if selected, 0 if not selected
PRE2	Availability of pre/made and pre/cooked meals – coded 1 if selected, 0 if not selected
LOCALFOOD2	Availability of local food options – coded 1 if selected, 0 if not selected
ORGAN2	Availability of organic and/or healthy options – coded 1 if selected, 0 if not selected
LOCALBUS2	Supporting local businesses – coded 1 if selected, 0 if not selected
FAMHEALTH8	Family's health – coded 1 if selected, 0 if not selected
QUALITY8	Quality of the produce – coded 1 if selected, 0 if not selected
TASTE8	Tastes better – coded 1 if selected, 0 if not selected
SUPLOCAL8	Support local farms – coded 1 if selected, 0 if not selected
KNOWFARMER8	Knowing the farmers – coded 1 if selected, 0 if not selected
COMMUNITY8	Sense of community – coded 1 if selected, 0 if not selected
FOODSAFE8	Food safety concerns – coded 1 if selected, 0 if not selected
ENVCONCERN8	Concern for the environment – coded 1 if selected, 0 if not selected

## Chapter IV

### Qualitative Results

#### *Introduction to Qualitative Results*

This chapter will first present the results from the consumer focus groups, followed by the qualitative results from the consumer survey. The regression analysis results will be discussed later in Chapter V. The results of each question asked in the focus groups will be discussed, followed by key takeaways from the focus groups. The chapter will then present the survey results. Results of the survey discussed in this chapter include consumer attitudes and opinions regarding local produce, the results of the willingness to pay section of the survey, and the effect of the COVID-19 pandemic on the purchase of local produce. Further discussion of these results, combined with the regression analysis results found in Chapter V, will be continued in Chapter VI.

#### *Focus Group Results*

The two focus groups revealed several important factors with the potential to influence consumption of local produce unique to the region. Most of the participants had an interest in local food, thus their reason for participating. The information gathered in the focus groups was useful in preparing the survey questions. The results of each question asked in the focus groups will be discussed here.

The first question asked participants how they decide where they do their food shopping. This led to a conversation about how many locations they do their food shopping at. Every participant except for one stated they do their food shopping at more than one location. Three participants do their food shopping at two locations, two at three locations, three at four locations, and one at more than five locations. All participants shop at a chain supermarket for at

least some of their food. Other locations include farm stands, local markets, and local butchers. Four participants also have their own gardens at home, not included in the location count. The top three reasons for choosing where food shopping is done were selection of local foods, convenience, and healthier choices. Other reasons given were support of local farmers and businesses, organic options, and enjoyment of the shopping process at a certain location. These responses may indicate that the number of locations food shopping is done may correlate with prioritization of local and healthy food options.

Question three, which asked participants how much of the produce they purchase is local as a percentage of total produce purchased by the household, provided important information. This question has been asked in similar studies in other areas of the country, particularly in the Midwest and southern states. Asking this question in New Hampshire identified a major barrier to purchasing local produce: seasonality. Most participants felt they were unable to answer the question without dividing it into winter months and the rest of the year. Almost every participant stated they purchase significantly more local produce in late Spring through the Fall, but cannot purchase much in the winter months due to the lack of availability. The three participants that did provide an answer for the whole year did a majority of their food shopping at a chain supermarket. The amounts given from these three participants ranged from 10% to 35%. Of the participants who divided the question into winter and summer months, the amount of local produce purchased in the winter months ranged from 5% to 45% while the amount purchased in the rest of the year ranged from 15% to 98%, with all but one participant answering more than 70% during the rest of the year. Several participants stated they purchase less produce during the winter months by pickling or storing produce from their home gardens or produce that was purchased locally during the rest of the year.



Question four revealed the variety of ways consumers get their information on local food. Most participants do not go out of their way to find information on local food, instead relying on easily accessible information. The top two ways respondents find information on local food are word of mouth and signs in the supermarket. Other answers given were social media, driving by a farm stand, newsletters, and a local food organization. Several participants expressed their frustration about the difficulty they have finding information on local food and said it is a time-consuming process to figure out where it is located. They stated they would like to see better advertising for local food, and to be able to find it more easily. Two participants who felt they could find local food relatively easily were both residents of Grafton county, which seems to have a strong local food presence. One participant utilizes Local Foods Plymouth, a network of local farmers and producers that allows residents to order from different farms and producers online and have their order delivered or picked up in one location. The other resident of Grafton county stated she knew of and patronized a variety of farm stores and farm stands. No respondents from other counties expressed the same level of knowledge about local food locations.

Benefits of purchasing local produce were identified in question five. Almost every participant said the most important benefit is supporting local businesses and farms. Other common answers were the environmental benefits, such as the produce traveling shorter distances, and knowing where your food comes from. Many participants were concerned about food safety, and enjoy knowing exactly where their local produce was processed and who has handled it. Several comments about the quality of local produce compared to non-local were made. Participants stated they felt local produce tasted better or had a stronger, more flavorful taste. They also felt local produce is fresher, and several believed local produce has a better

nutritional value. Participants agreed they were unsure if certain benefits are real or perceived, such as the assumption that local food is safer, more nutritional, and grown with less pesticides. However, both the real and potentially perceived benefits made all participants feel better about buying local produce compared to non-local, and they enjoy the feeling of doing right by their families health and their communities.

The last question asked what prevents participants from purchasing more local produce. The top answer, identified in question three, is the seasonality of local produce in New Hampshire. Every participant who seeks out local produce stated they wished they could get more of it during winter months and that seasonality is one of the only barriers. Many of the focus group participants were knowledgeable and cared about local produce, therefore they were willing to shop at multiple locations and pay the higher cost for local produce. These two common barriers identified in other surveys, as discussed in the literature review, did not seem to be large concerns among the focus group participants. This is likely due to consumer attitudes; if one cares about local produce, they will likely be willing to make sacrifices to buy it. Convenience was another top answer, with several participants responding that they did not have the time to go out of their way to find local produce or shop at multiple locations. Other reasons given were difficulty finding information on where to purchase local produce, the cost, and not knowing how to cook.

The focus groups identified several key pieces of information. The most important result was the prominence of seasonality as a barrier to purchasing local produce in the state of New Hampshire. Because of this, survey respondents were asked to divide the amount of local produce purchased by their household as a percentage of the total amount of produce purchased into winter months and the rest of the year. This will provide more accurate insight into how

much local produce New Hampshire residents purchase, as there will be a significantly lower total during the winter months. Dividing the responses into two time periods removes the seasonality barrier that would pull a yearly average down and allows for a more accurate estimate of the total amount of local produce New Hampshire residents purchase. Another interesting outcome was the large amount of awareness about and interest in local food among the participants. However, because participants were recruited and not selected randomly this could be a coincidence as people interested in local food might have been more likely to want to participate. The survey will reveal if there is a higher awareness of local food compared to other states, as the results can be compared to those of similar studies.

### Consumer Survey Qualitative Results

#### *Introduction to Consumer Survey Results*

In the following section, the qualitative results from the consumer survey will be presented. The results are presented by topic, starting with respondent demographics. This will be followed by a discussion of general shopping habits. Thirdly, attitudes and opinions regarding local produce will be analyzed. Finally, the results of the willingness to pay section of the survey are provided. This section will conclude with a summary of the key findings from the qualitative results of the consumer survey.

#### *Consumer Survey Demographics*

Similar to the state population, just over half (54.5%) of the survey respondents were female. While New Hampshire's population is slightly older than that of the country's, the respondents sampled were older than the state's population with an average age of 59 years old. There was a serious oversampling of individuals 50 years of age and older, who represent 83.2%

of the sample. Oversampling in the higher percentiles occurred with education and income as well. 36.8% of respondents hold a graduate degree, much higher than the state average. Zero respondents did not graduate high school, 3.7% graduated high school or obtained their GED, 3.1% attended technical school or a certificate program, 14.3% had some college education, 5.3% hold a two year college degree, and 35.8% hold a four year college degree. These results indicate that the sample is more educated compared to the state population. Regarding income, respondents had a higher household income in 2020 than the state average. 1.9% of respondents made less than \$15,000, 6.9% made between \$15,000 and \$29,999, 5.3% made between \$30,000 and \$44,999, 5.6% made between \$45,000 and \$59,999, 10.3% made between \$60,000 and \$74,999, 10.3% made between \$75,000 and \$89,999, 13.5% made between \$90,000 and \$104,999, and 32.3% made \$105,000 or more. According to the 2019 U.S. Census, the median household income in New Hampshire is \$76,768. A majority of the sample had above average income, with 69.5% making at least \$75,000 in 2020. The average household size was aligned with the state average at 2.5 individuals, including the respondents themselves, however the number of households with individuals under the age of 18 was lower than the state average at 22.9%. The average number of individuals under the age of 18 per household was less than one. The race of respondents is relatively similar to that of the state's population. New Hampshire is known for its low diversity, which is reflected in the sample. 94.4% of respondents identified as Caucasian, 1.6% as Latin or Hispanic, .3% as Asian and Pacific Islander, .3% as African American, and 1.6% as other. The number of respondents from each county was mostly representative of the population of each. 3.7% of the sample is from Belknap county, 5.9% is from Carroll county, 4.4% is from Cheshire county, 2.5% is from Coos county, 9% is from

Grafton county, 22.7% is from Hillsborough county, 14.3% is from Merrimack county, 24.3% is from Rockingham county, 10.3% is from Strafford county, and 2.8% is from Sullivan county.

Table 2. Consumer Survey Demographics

<b>CHARACTERISTIC</b>	<b>MEAN</b>	<b>STANDARD DEVIATION</b>
FEMALE	54.52%	.50
AGE	59.66	12.13
HOUSEHOLD SIZE	2.46	1.18
MINORS IN HOUSEHOLD	.40	.82
<b>PERCENT OF TOTAL</b>		
<b>EDUCATION LEVEL</b>		
DID NOT GRADUATE HIGH SCHOOL		0%
HIGH SCHOOL GRADUATE/GED		3.74%
TECHNICAL SCHOOL/CERTIFICATE PROGRAM		3.12%
SOME COLLEGE		14.33%
2-YEAR COLLEGE DEGREE		5.30%
4-YEAR COLLEGE DEGREE		35.83%
GRADUATE DEGREE		36.76%
<b>INCOME LEVEL</b>		
LESS THAN \$15,000		1.88%
\$15,000-\$29,999		6.90%
\$30,000-\$44,999		5.33%
\$45,000-59,999		5.64%
\$60,000-\$74,999		10.34%
\$75,000-\$89,999		10.34%
\$90,000-\$104,999		13.48%
MORE THAN \$105,000		32.39%
<b>RACE</b>		
CAUCASIAN		94.38%
LATIN/HISPANIC		1.56%
ASIAN AND PACIFIC ISLANDER		.31%
AFRICAN AMERICAN		.31%
OTHER		1.56%

## General Shopping Habits

Respondents were asked about their general food shopping habits in first section of the survey. The first question asked at how many locations the respondent does their food shopping at, with 18.1% of respondents completing their food shopping at one location, 37.7% at two locations, 29.6% at three locations, and 14.6% at more than three locations. When asked how many times a week they shop for food, 42.1% answered they shop for food once a week, 35.9% shop twice a week, 17.6% shop three times a week, and 4.4% shop four times a week. In this section of the survey, respondents were asked what factors help determine where they do their food shopping. They were able to select multiple responses. The top answer was price (66.0%), followed by convenience (57.3%), variety (51.4%), availability of organic and healthy options (45.0%), local food options (41.7%), supporting local businesses (41.3%), time (29.6%), availability of bulk items (8.7%), and availability of pre-made and pre-cooked meals (4.7%).

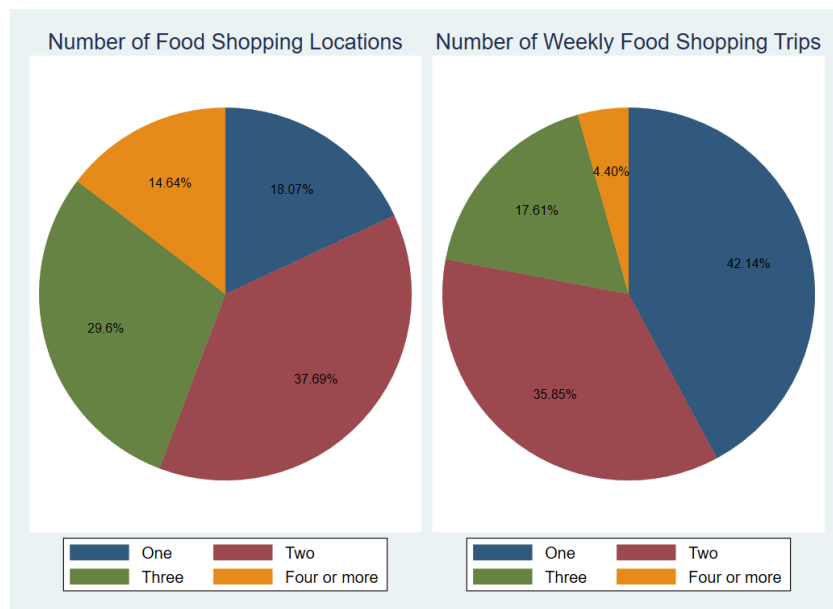


Figure 1. The number of locations respondents complete their food shopping at and the number of food shopping trips taken weekly.

Table 3. Factors Determining Food Shopping Location

<b>FACTOR</b>	<b>FREQUENCY</b>	<b>PERCENT</b>
PRICE	212	66.04%
CONVENIENCE	184	57.32%
VARIETY	165	51.40%
AVAILABILITY OF HEALTHY/ORGANIC OPTIONS	145	45.17%
LOCAL FOOD OPTIONS	134	41.74%
SUPPORTING LOCAL BUSINESSES	133	41.43%
TIME	95	29.60%
AVAILABILITY OF BULK ITEMS	28	8.72%
AVAILABILITY OF PRE-MADE/PRE-COOKED MEALS	15	4.67%

### *Attitudes and Opinions Regarding Local Produce*

Several different aspects of local produce consumption were explored in the survey. Information gathered includes how consumers compare local produce to non-local produce, perceived safety and health benefits of local produce, and where and why local produce is purchased. Section B, which gathered most of the information relating to local produce, began with the definition of local versus non-local produce. As mentioned previously, the definition of local produce used for this research was any fruit or vegetable grown within the New England region.

In order to understand how consumers perceive locally grown produce, respondents were asked to compare local produce to non-local produce on seven different characteristics: taste, appearance, availability, environmental impact, food safety, freshness, and health benefits. Local produce could be rated as inferior, somewhat inferior, about the same, somewhat superior, or superior to non-local produce for each characteristic. There was also an “unsure” option. The only characteristic participants find local produce to be somewhat inferior to non-local produce

is availability. Otherwise, the majority of participants find local produce to be somewhat superior or superior for all other characteristics.

When it comes to the taste of local produce, 42.4% of respondents find it to be superior to that of non-local produce and 36.8% find it somewhat superior. Only .31% of respondents find the taste to be somewhat inferior to that of non-local produce, and another .31% find it inferior. 17.1% responded they feel the taste is the same for both options, and 3.1% of respondents were unsure about the comparison between the two for this characteristic.

Regarding the appearance of local produce compared to non-local produce, 24.6% of respondents feel it is superior, and 29.9% feel it is somewhat superior. A majority of respondents feel the appearance of the two options are about the same (36.1%). Only 5% of respondents feel the appearance of local produce is somewhat inferior, and no respondents feel it is inferior to that of non-local produce. 4.4% were unsure about the comparison for this characteristic.

When comparing the availability of local produce to that of non-local produce, the majority of respondents find local produce to be somewhat inferior (41.7%) and 5.9% find it to be inferior. Comparing the availability of local and non-local produce. 27.1% of respondents find the availability to be about the same. Only 10.9% of respondents find the availability of local produce to be somewhat superior, while 10.3% find it superior. 4% of respondents were unsure about this comparison.

A majority of respondents find local produce to be superior when it comes to the environmental impact (48.3%). 24.5% responded that local produce is somewhat superior to non-local produce regarding the environmental impact. 13.8% of respondents feel the environmental

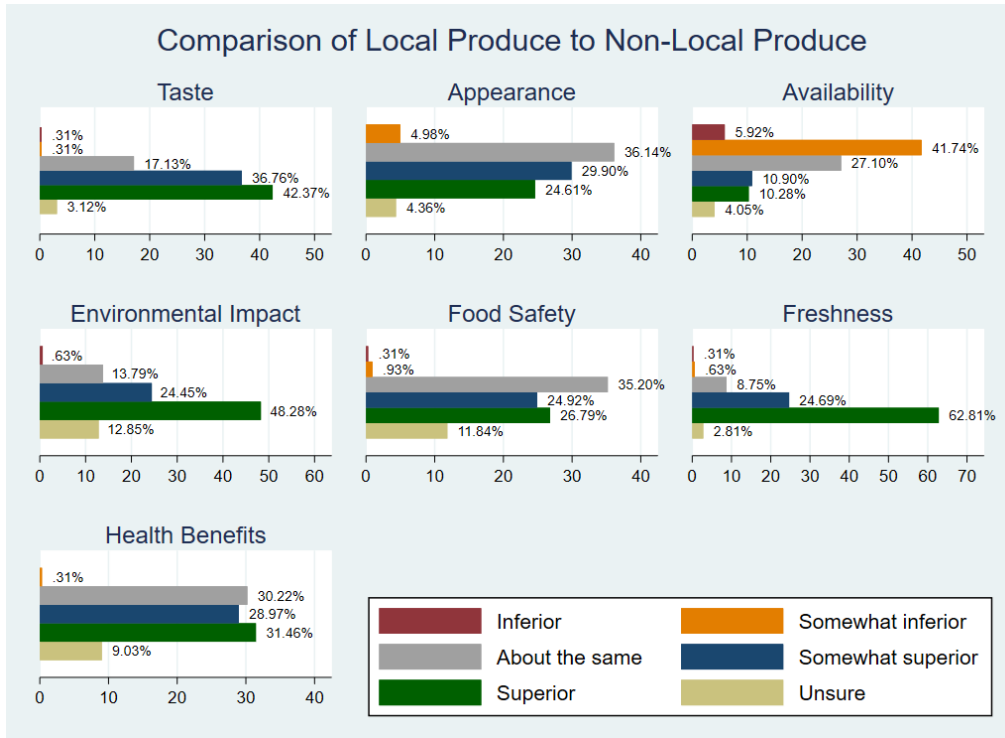


impact of the two is about the same, and only .63% feel local produce is inferior. Finally, 12.9% of respondents were unsure which option is superior or inferior.

Food safety is the next characteristic respondents were asked to consider. Respondents find local produce to be equally as safe or safer than non-local produce, with only .31% and .93% finding local produce to be inferior or somewhat inferior, respectively. 35.2% feel local and non-local produce are about the same when it comes to food safety. 24.9% feel local produce is somewhat superior, and 26.8% feel it is superior. 11.8% of respondents were unsure of the comparison between the two for this characteristic.

The most unanimous response came from the comparison of freshness, with 62.8% of respondents stated they feel local produce is superior to non-local produce when it comes to freshness, and 24.7% feel it is somewhat superior. Of the remaining respondents, 8.8% said they feel the freshness of the two are about the same and 2.8% were unsure which option is fresher.. Only .63% of respondents feel the freshness of local produce is somewhat inferior, and .31% feel it is inferior.

Lastly, respondents were asked to compare the health benefits of local produce to those of non-local produce. Over half of respondents feel local produce is superior to some degree in this regard, with 31.5% stating they feel local produce is superior and 29% stating it is somewhat superior. A large number of respondents felt the health benefits between the two are about the same (30.2%) and 9% were unsure which option has better health benefits. Only .31% feel the health benefits of local produce are somewhat inferior to those of non-local produce, and no respondents feel that the health benefits of local produce are inferior.



*Figure 2. Consumer comparisons of local produce to non-local produce for seven characteristics.*

In addition to comparing local and non-local produce on the above characteristics, respondents were also asked to rate their level of concern regarding three additional aspects: use of pesticides, risk of potential food-borne illnesses, and risk of potential long-term health issues. Level of concern could be rated as very concerned, somewhat concerned, not very concerned, or not at all concerned. Respondents could also say they were unsure of their level of concern for each aspect. The results are summarized in Figure 3. Respondents had higher levels of concern for all three attributes in non-local produce, with 77.9% of respondents stating they were somewhat or very concerned about pesticide use, 66.7% stating they were somewhat or very concerned about risk of potential food-borne illnesses, and 47% stating they were somewhat or very concerned about the risk of long-term health issues with non-local produce. This is

compared to 53.9%, 30.8%, and 19.6% of respondents stating they were somewhat or very concerned about the same issues, respectively.

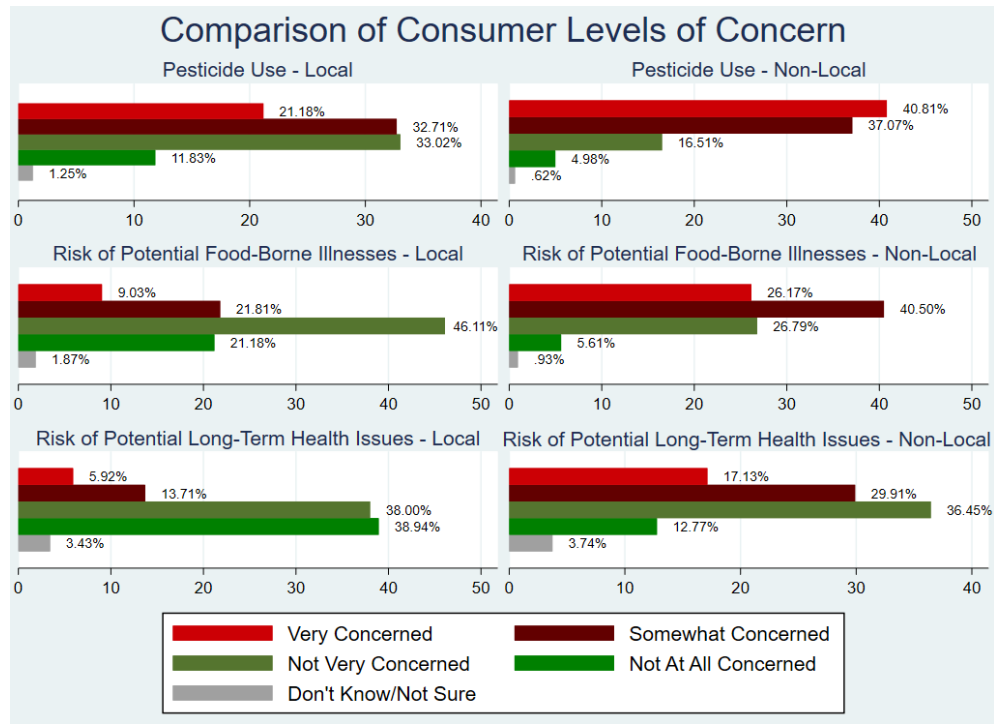


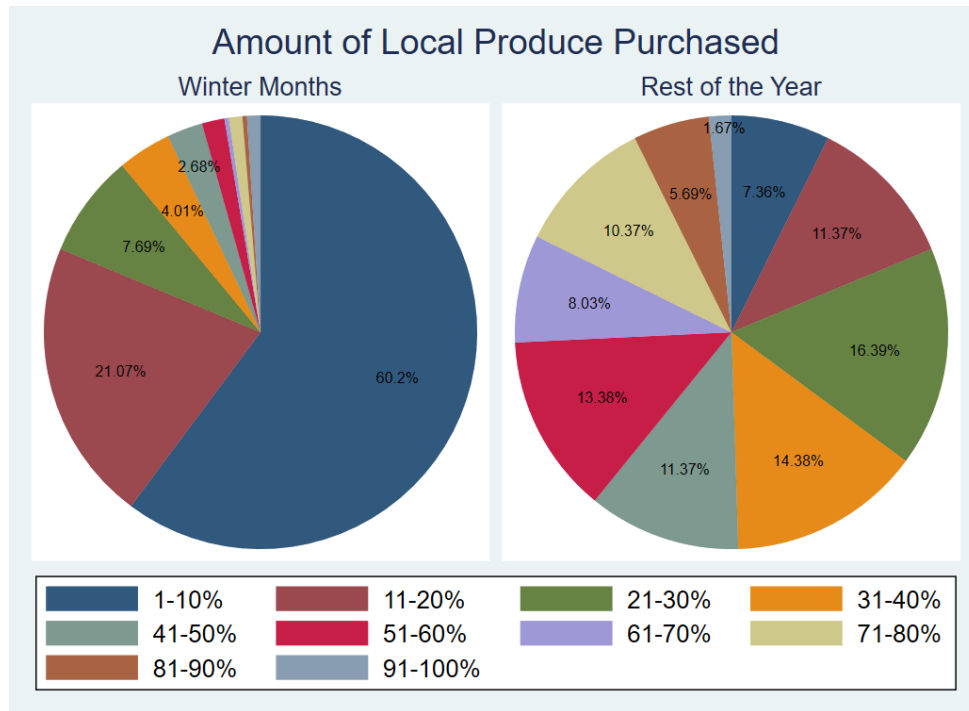
Figure 3. Comparison of consumer levels of concern regarding use of pesticides, risk of potential food-borne illnesses, and risk of potential long-term health issues with local and non-local produce.

### Local Produce Purchasing Habits

When asked if they had purchased locally grown produce in the past 12 months, 93.5% of respondents had, 1.3% had not, and 5.3% were unsure if they had. This result suggests the existence of self-selection bias, meaning the individuals who chose to take the survey have an interest in local food. This indicates the results of the survey do not reflect the habits and opinions of the average consumer and instead reflect the habits and opinions of consumers who already have a tendency to purchase local food. Interestingly, three of the five SNAP participants

had purchased local produce in the past 12 months. This result is still significant despite the small number of overall SNAP participants because past studies, such as one conducted by Racine et al. (2013), found that participation in the SNAP was associated with not purchasing any local produce. Looking at the number of respondents who purchased local produce in the past 12 months by county, every respondent in Belknap, Carroll, and Coos county answered that they had. Between one and three people from the remaining counties selected an answer other than yes, with the exception of Hillsborough county. Nine Hillsborough county residents responded that they were unsure if they had purchased any local produce in the past 12 months. Because of the small sample size, it is unable to be determined if this is due to a reason other than sample size, but it is still of note.

Respondents who had purchased local produce in the past 12 months were asked how much of the total amount of produce they purchased was local produce on a scale of 1-10%, 11-20%, 21-30%, 31-40%, 41-50%, 51-60%, 61-70%, 71-80%, 81-90%, and 91-100%. They recorded two answers, one for the winter months and one for the rest of the year. Results showed much higher percentages of local produce purchased during the rest of the year compared to the winter months. The average response for the winter months was 1-10%, while the average response for the rest of the year was 31-40%. For the winter months, 60.2% of respondents purchased 1-10%, 21.1% purchased 11-20%, 7.7% purchased 21-30%, 4% purchased 31-40%, 2.7% purchased 41-50%, 1.7% purchased 51-60%, .33% purchased 61-70%, 1% purchased 71-80%, .33% purchased 81-90%, and 1% purchased between 91-100%. For the rest of the year, 7.4% of respondents purchased 1-10%, 11.4% purchased 11-20%, 16.4% purchased 21-30%, 14.4% purchased 31-40%, 11.4% purchased 41-50%, 13.4% purchased 51-60%, 8% purchased 61-70%, 10.4% purchased 71-80%, 5.7% purchased 81-90%, and 1.7% purchased 91-100%.



*Figure 4. The amount of local produce purchased as a percentage of total produce purchased in the winter months and the rest of the year.*

To identify where consumers purchase local produce from, respondents were provided a list of locations and asked how much of the produce they purchase or consume is from each. Answers were given as a percentage and needed to equal 100% across all locations. Possible locations were supermarkets, supercenters, health or natural supermarkets, farmers markets, directly from the producer (Community Supported Agriculture (CSA), farm stores, farm stands), home or community gardens, and a neighbor or friend’s garden. An “other” option was listed as well. Results revealed 83.9% of respondents purchased local produce from a supermarket, 10.4% from a supercenter, 29.4% from a health or natural supermarket, 56.1% from a farmers market, 56.9% directly from a producer, 37.7% from a community or home garden, 25.8% from a neighbor or friend’s garden, and 5.4% got local produce from other sources.

Table 4. Sources of Local Produce

<b>SOURCE</b>	<b>FREQUENCY</b>	<b>PERCENT</b>
SUPERMARKET	251	83.95%
SUPERCENTER	31	10.37%
HEALTH/NATURAL SUPERMARKET	88	10.37%
FARMERS MARKET	166	56.08%
DIRECT FROM PRODUCER	170	56.86%
HOME OR COMMUNITY GARDEN	112	37.71
NEIGHBOR OR FRIEND'S GARDEN	77	25.84%
OTHER	16	5.39%

Figure 5 is a box plot depicting the spread, outliers, and interquartile ranges of the amount of local produce acquired by source. The boxes in a box plot extend from approximate first to third quartiles, known as the interquartile range. The first and third quartiles are separated by the median, represented by a line in the box. The boxes represent roughly the middle 50% of the data. Outside the boxes are the tails that represent the distribution of the data, with outliers marked as circles outside the tails. Table 4 includes only those data points greater than 0, meaning it shows responses only from those who acquire local produce from that location.

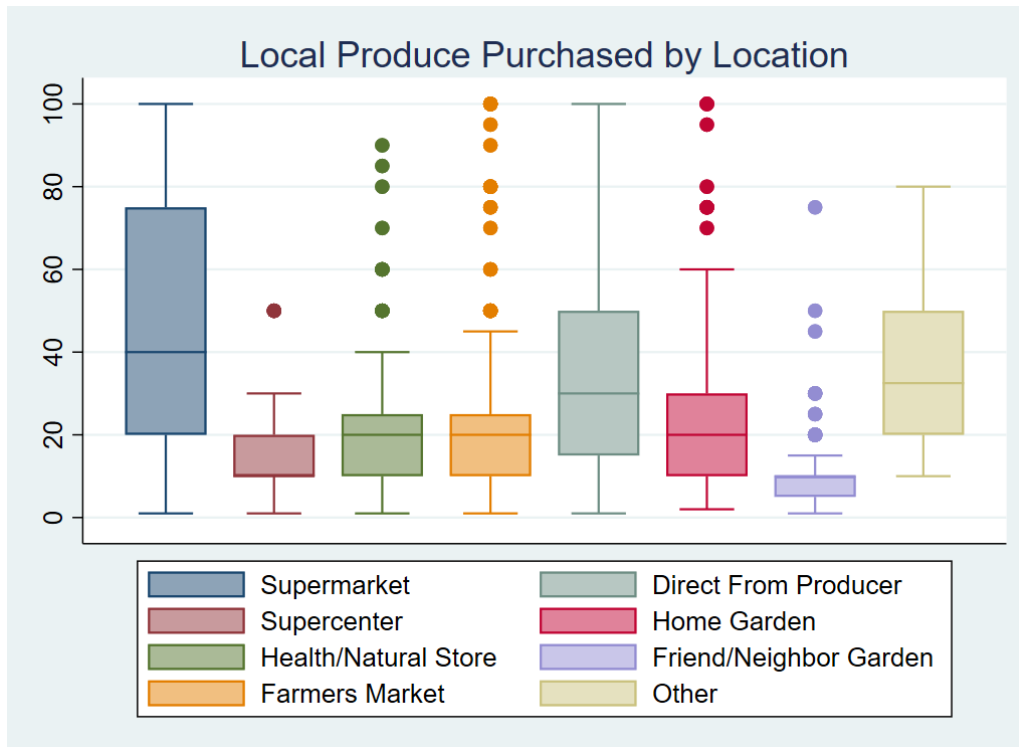


Figure 5. Amount of local produce purchased as a percentage of all local produce purchased by source. Box plot depicts spread, outliers, and the interquartile ranges of the results.

If the respondent had purchased locally grown produce in the past 12 months, they were asked their reason or reasons for purchasing. Possible answers were: my family’s health, quality of the produce, tastes better, supporting local farms, knowing the farmers, sense of community, food safety concerns, and concern for the environment. They were able to select multiple responses. The top answer was supporting local farms (87.3%), followed by quality of the produce (80%), tastes better (70%), sense of community (53.3%), concern for the environment (45%), my family’s health (34%), knowing the farmers (32%), and food safety concerns (19.7%).

Table 5. Factors Determining Purchasing of Local Produce

<b>FACTOR</b>	<b>FREQUENCY</b>	<b>PERCENT</b>
SUPPORTING LOCAL FARMS	262	87.33%
QUALITY OF PRODUCE TASTES BETTER	240	80.00%
SENSE OF COMMUNITY CONCERN FOR THE ENVIRONMENT	160	53.33%
MY FAMILY’S HEALTH	135	45.00%
KNOWING THE FARMERS	102	34.00%
FOOD SAFETY CONCERNS	96	32.00%
	59	19.67%

In order to identify potential barriers to purchasing local produce, respondents who had purchased local produce in the past 12 months were asked for the main reason they hadn’t purchased more. Possible answers were: seasonality, price, farm stand and/or farmers market hours of operation and/or location, not knowing where to find it (lack of information), or that they already buy all the local produce they want. Respondents who had not purchased any local produce in the past 12 months or were unsure if they had were asked for the main reason they had not purchased any. Possible answers were: price, farm stand and/or farmers market hours of operation and/or location, not knowing where to find it (lack of information), or that they did not wish to purchase any local produce.

Among respondents who had purchased local produce in the past 12 months, nearly two-thirds stated that seasonality is the main reason they do not purchase more local produce (63%). This was followed by farm stand and/or farmers market hours of operations and/or location (12.3%), price (8.7%), not knowing where to find it (5%), and already buying the amount of local produce they want (4%). 7% of respondents selected the “other” option.



The small sample of respondents that had not purchased local produce in the past 12 months or were unsure if they had (n = 21) indicated the main reason they hadn't bought any local produce was lack of availability (19.1%). This was followed by farm stand and/or farmers market hours of operation and/or location (14.3%), not knowing where to find it (14.3%), price (4.8%), and not wishing to purchase it (4.8%). 42.9% provided other reasons for not purchasing local produce, a majority of which were related to the COVID-19 pandemic. The effect of the pandemic on the purchase of local produce is explored more below.

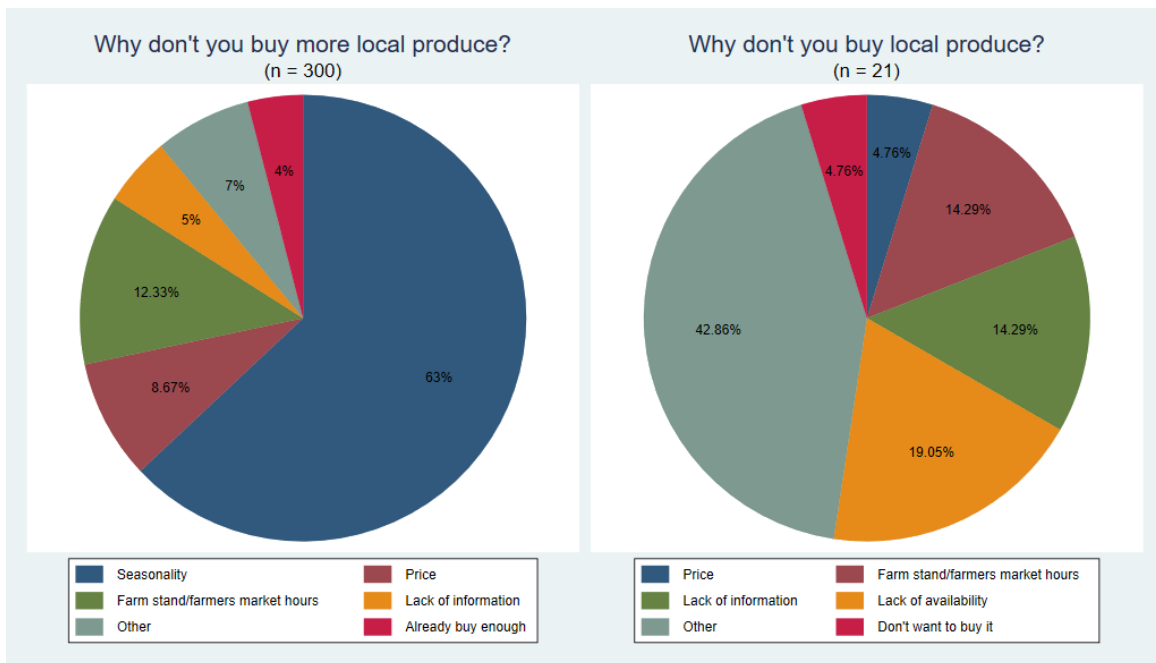


Figure 6. Barriers to purchasing local produce. Left pie chart shows responses among consumers who had purchased local produce in the past 12 months. Right pie chart shows responses among consumers who had not purchased any local produce in the past 12 months or were unsure if they had.

All respondents were asked how they typically get information about local produce, and how they wish they could get more information about local produce. The response options for

both questions were: social media, newspaper ads, email newsletters, road signs, through town websites, local event calendars, and word of mouth. Respondents could select multiple answers. Regarding ways they currently get information about local produce, the most common answer was word of mouth (59.5%), followed by road signs (35.8%), local event calendars (27.7%), social media (25.2%), newspaper ads (15.9%), email newsletters (13.7%), and town websites (13.4%). When asked how they wish they could get more information on local produce, 18.7% responded they did not want more information on local produce. Among respondents who do, the top answer was through town websites (32.4%), followed by local event calendars (29.3%), social media (26.5%), email newsletters (24.6%), road signs (16.8%), newspaper ads (14%), and word of mouth (12.5%).

Table 6. Methods of Acquiring Information on Local Produce

METHOD	WHERE CONSUMERS CURRENTLY GET INFORMATION ON LOCAL PRODUCE		WHERE CONSUMERS WANT TO GET MORE INFORMATION ON LOCAL PRODUCE	
	FREQUENCY	PERCENT	FREQUENCY	PERCENT
<b>SOCIAL MEDIA</b>	81	25.23%	85	26.48%
<b>NEWSPAPER ADS</b>	51	15.89%	45	14.02%
<b>EMAIL NEWSLETTERS</b>	44	13.71%	79	24.61%
<b>ROAD SIGNS</b>	115	35.83%	54	16.82%
<b>TOWN WEBSITES</b>	43	13.40%	104	32.40%
<b>LOCAL EVENT CALENDARS</b>	89	27.73%	94	29.28%
<b>WORD OF MOUTH</b>	191	59.50%	40	12.46%

### *Willingness to Pay for Local Produce*

As discussed in the literature review, willingness to pay (WTP) estimates for local produce in past studies vary greatly. For the purpose of this research, the WTP questions were made as specific as possible rather than asking for a general premium consumers would be

willing to pay for local produce. Respondents were asked to select the price they would be willing to pay for five different types of produce: beefsteak tomatoes, carrots, strawberries, green beans, and snap peas. Each question stated the average price of the non-local option, and asked respondents what price they would be willing to pay for a local option. Possible responses started at the same price as the non-local option and increased in 5% increments up to 25%. Respondents could also answer that they wouldn't purchase the item at the lowest price provided, or that they did not like or did not wish to purchase the item. Because of the self-selection bias that is present with this sample, the WTP responses gathered here are likely higher than they would be if these questions had been asked of a truly random sample. Results of the WTP questions are provided in Figure 7.

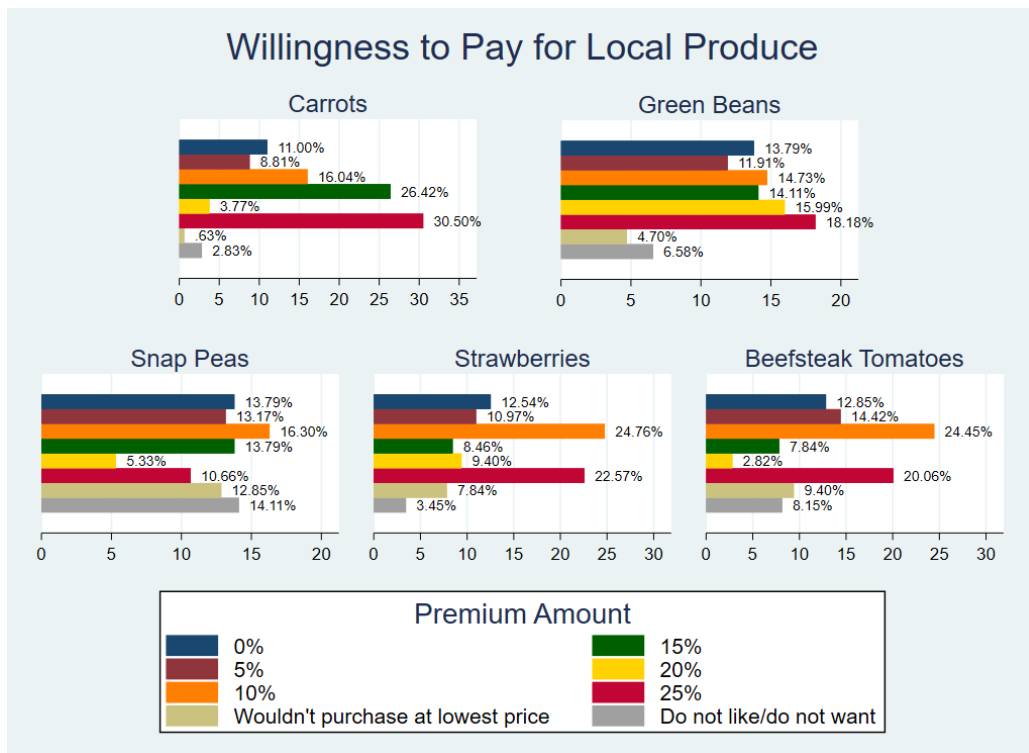


Figure 7. Willingness to pay (WTP) for five different types of locally grown produce.

The results from the WTP questions reveal several assumptions about the sample. First, the results reflect much higher premiums than the ones found in similar research. This confirms that the respondents are likely more interested in local produce than the average consumer. Secondly, consumers who care about purchasing local produce likely do not take price into consideration. A large number of consumers in this sample were willing to pay a 25% premium for all five types of produce, which is a stark contrast from the WTP results found in other studies. Results from this survey indicate at least some of the respondents may be willing to pay more than a 25% premium for locally grown produce. Due to the self-selection bias that occurred with this sample, a recommendation on a possible premium for local produce cannot be made.

#### *The Effect of COVID-19 on Local Produce Purchasing*

Due to the timing of this research, the effect of the COVID-19 pandemic on the purchasing of local produce had to be taken into consideration. Three pandemic-related questions were added to the survey. Respondents were first asked if the pandemic had changed how they do their food shopping. Response choices given were: taking fewer shopping trips, using grocery delivery or curbside pickup, purchasing cheaper items, purchasing more in bulk, purchasing more pre-packaged or pre-cooked meals, or none of the above. An “other” option was provided as well. Only 22.4% of respondents selected “none of the above,” indicating their food shopping habits had not changed due to the pandemic. This means the remaining 77.6% of the sample have changed their food shopping habits in some way due to the pandemic. The ways in which these respondents have changed their food shopping habits due to the pandemic are broken down in Table 7.

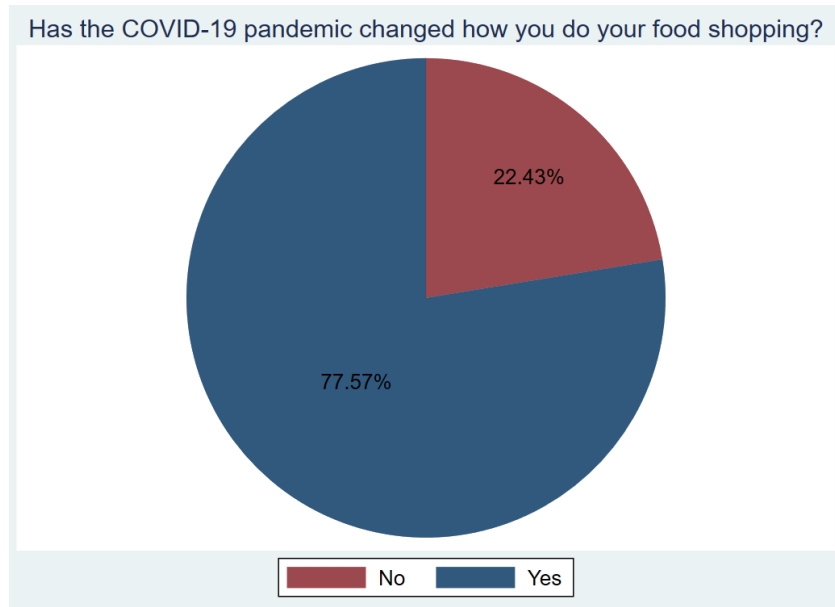


Figure 8. Percentage of respondents who reported changes to their food shopping habits due to the COVID-19 pandemic.

Table 7. Changes to Food Shopping Habits Due to COVID-19

CHANGE	FREQUENCY	PERCENT
TAKING FEWER SHOPPING TRIPS	207	64.49%
USING GROCERY DELIVERY OR CURBSIDE PICKUP	57	17.76%
PURCHASING CHEAPER ITEMS	23	7.17%
PURCHASING MORE IN BULK	62	19.31%
PURCHASING MORE PRE-PACKAGED/PRE-COOKED MEALS	27	8.41%
OTHER	19	5.92%

To gauge the impact of COVID-19 on the purchasing of local produce, participants were asked if they were purchasing more or less local produce due to the pandemic. The scale was much more, somewhat more, about the same amount, somewhat less, much less, or unsure. A

majority of respondents has been purchasing about the same amount of local produce during the pandemic (57.9%). A small number of respondents are purchasing more local produce during the pandemic (13.7%), with 11.8% purchasing somewhat more and 1.9% purchasing much more. The number of respondents purchasing less local produce is slightly greater at 22.4%, with 15.9% purchasing somewhat less and 6.5% purchasing much less. Finally, 5.9% stated they were unsure if there was a difference in their purchasing of local produce during the pandemic. The respondents who said they had purchased less locally grown produce during the pandemic were asked the reason or reasons they had purchased less. Possible answers were: can no longer afford it, can't find it anymore/fewer sources, switched to grocery delivery, don't have time to worry about it anymore, and no longer a priority. Respondents could select multiple answers.

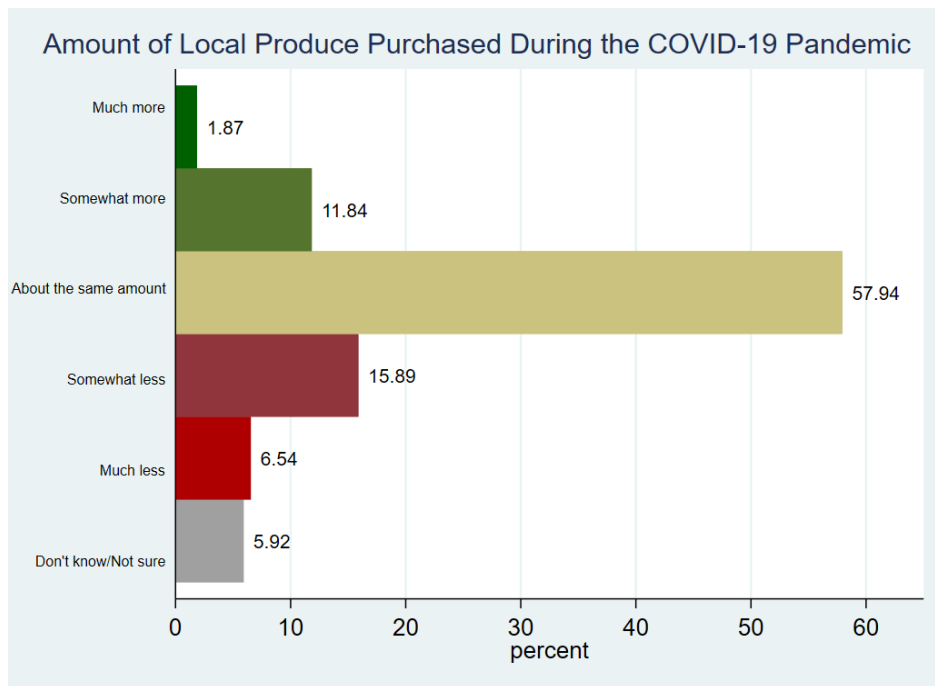


Figure 9. Change in the quantity of local produce purchased due to the COVID-19 pandemic.

Table 8. Reasons for Decrease in Local Produce Purchasing Due to COVID-19

<b>REASON</b>	<b>FREQUENCY</b>	<b>PERCENT</b>
CAN NO LONGER AFFORD IT	8	11.11%
CAN'T FIND/FEWER SOURCES	40	55.56%
SWITCH TO GROCERY DELIVERY	14	19.44%
DON'T HAVE TIME TO WORRY ABOUT IT	9	12.50%
NO LONGER A PRIORITY	5	6.94%
OTHER	14	19.44%

## CHAPTER V

### Quantitative Results

#### *Introduction to Quantitative Results*

In the last chapter, the qualitative results of the survey were presented. In this chapter, the quantitative results, including the results of the logit model, will be analyzed. The logit model was run three times with different minimums of local produce purchased as the dependent variable. This chapter will end with a summary of the results of the quantitative results. The end of this chapter concludes the results presented in this thesis, which will be discussed in more detail in Chapter VI.

#### *Logit Model Results*

The logit model was run with three different threshold points. In the first model,  $y = 1$  if the respondent purchases 31% or more of their produce locally and  $y = 0$  if they purchased less than 31%. The second model had a threshold of 41%, and the third model had a threshold of 51%. The models will hereby be referred to as Model 1, Model 2, and Model 3, respectively. Because of the increasing thresholds, the size of the sample for which  $y = 1$  decreases with each model. The summary statistics for the models are shown in Table 9. The estimated coefficients and odds ratios were calculated using STATA statistical software. Results of the three models are listed in Tables 10, 11, and 12, respectively. All three chi-squared results imply the models are statistically significant.



Table 9. Summary Statistics

VARIABLE	DEFINITION	MEAN	STD. DEV.
BUYLOCAL	Coded 1 when amount of local produce purchased is within or above the given threshold bracket, 0 if the amount is below the threshold bracket		
BUYLOCAL1	At least 31% of total produce purchased is local	.647	.479
BUYLOCAL2	At least 41% of total produce purchased is local	.503	.501
BUYLOCAL3	At least 51% of total produce purchased is local	.390	.489
SEX	Coded 0 for male (43.3%), 1 for female (54.5%)	.557	.497
AGE	Respondent's age in years (23-85; mean 60)	59.658	12.134
EDUC	Respondent's level of education – high school graduate/GED (3.7%, coded 0), technical school/certificate program (3.1%, coded 1), some college (14.3%, coded 2), 2-year degree (5.3%, coded 3), 4-year degree (35.8%, coded 4), graduate degree (36.8%, coded 5)	3.783	1.360
INCOME	Respondent's household income before taxes in 2020 – less than \$15,000 (1.9%, coded 0), \$15,000-\$29,999 (6.9%, coded 1), \$30,000-\$44,999 (5.3%, coded 2), \$45,000-\$59,999 (5.6%, coded 3), \$60,000-\$74,999 (10.3%, coded 4), \$75,000-\$89,999 (10.3%, coded 5), \$90,000-\$104,999 (13.5%, coded 6), \$105,000 or more (32.3%, coded 7)	5.004	2.141
HOUSEHOLD SIZE	Number of individuals in respondent's household, including themselves (1-6, mean 2.5)	2.458	1.180
MINORS	Number of individuals under the age of 18 in respondent's household (0-4, mean 0.4)	.401	.822
COUNTY	Belknap (3.7%, coded 0), Carroll (5.9%, coded 1), Cheshire (4.4%, coded 2), Coos (2.5%, coded 3), Grafton (9%, coded 4), Hillsborough (22.7%, coded 5), Merrimack (14.3%, coded 6), Rockingham (24.3%, coded 7), Strafford (10.3%, coded 8), Sullivan (2.8%, coded 9)	6.355	2.201
LOCATIONS	Number of locations respondent frequents for their food shopping – one (18.1%, coded 0), two (37.7%, coded 1), three (29.6%, coded 2), more than three (14.6%, coded 3)	1.408	.948
TRIPS	Number of times respondent goes food shopping per week – once (41.7%, coded 0), twice (35.5%, coded 1), three times (17.5%, coded 2), four or more times (4.4%, coded 3)	.843	.867
WINTERPURCHASE	Amount of local produce respondent purchases in the winter months – 1-10% (60.2%, coded 0), 11-20% (21.1%, coded 1), 21-30% (7.7%, coded 2), 31-40% (4%, coded 3), 41-50% (2.7%, coded 4), 51-60% (1.7%, coded 5), 61-70% (.33%, coded 6), 71-80% (1%, coded 7), 81-90% (.33%, coded 8), 91-100% (1%, coded 9)	.883	1.610
CONVEN2	Convenience – coded 1 if selected (57.3%), 0 if not selected	.573	.495
TIME2	Time – coded 1 if selected (29.6%), 0 if not selected	.296	.457
PRICE2	Price – coded 1 if selected (66%), 0 if not selected	.660	.474
VARIETY2	Variety – coded 1 if selected (51.4%), 0 if not selected	.514	.500
BULK2	Availability of bulk items – coded 1 if selected (8.7%), 0 if not selected	.087	.283
PRE2	Availability of pre/made and pre/cooked meals – coded 1 if selected (4.7%), 0 if not selected	.047	.211
LOCALFOOD2	Availability of local food options – coded 1 if selected (41.7%), 0 if not selected	.417	.494
ORGAN2	Availability of organic and/or healthy options – coded 1 if selected (45.2%), 0 if not selected	.452	.498

Table 9 Continued. Summary Statistics

<b>VARIABLE</b>	<b>DEFINITION</b>	<b>MEAN</b>	<b>STD. DEV.</b>
LOCALBUS2	Supporting local businesses – coded 1 if selected (41.4%), 0 if not selected	.414	.493
FAMHEALTH8	Family’s health – coded 1 if selected (34%), 0 if not selected	.340	.475
QUALITY8	Quality of the produce – coded 1 if selected (80%), 0 if not selected	.800	.401
TASTE8	Tastes better – coded 1 if selected (70%), 0 if not selected	.700	.459
SUPPLOCAL8	Support local farms – coded 1 if selected (87.3%), 0 if not selected	.873	.333
KNOWFARMER8	Knowing the farmers – coded 1 if selected (32%), 0 if not selected	.320	.467
COMMUNITY8	Sense of community – coded 1 if selected (53.3%), 0 if not selected	.533	.500
FOODSAFE8	Food safety concerns – coded 1 if selected (19.7%), 0 if not selected	.197	.398
ENVCONCERN8	Concern for the environment – coded 1 if selected (45%), 0 if not selected	.450	.498

Variables with the number 2 after them represent factors the respondent takes into consideration when deciding where they do their food shopping, while variables with the number 8 after them represent reasons the respondent purchases local produce.

Table 10. Model 1 Statistics, Estimated Coefficients, p-values, and Odds Ratios of the Independent Variables. Dependent Variable: Q≥31%

MODEL STATISTICS			
NUMBER OF OBSERVATIONS	247		
LIKELIHOOD RATIO	80.20***		
CHI <sup>2</sup> (27)	0.0000		
PROBABILITY > CHI SQUARED	0.2475		
PSEUDO R-SQUARED	0.2475		
VARIABLE	COEFFICIENT	P-VALUE	ODDS RATIO
SEX	.358	.294	1.43
AGE	.014	.258	1.01
EDUC	-.385	<b>.005**</b>	.681
INCOME	.015	.865	1.01
HOUSEHOLDSIZE	-.184	.405	.832
MINORS	.229	.453	1.26
COUNTY	.033	.669	1.03
LOCATIONS	.067	.748	1.07
TRIPS	.094	.670	1.10
WINTERPURCHASE	.697	<b>.002***</b>	2.01
CONVEN2	.343	.342	1.41
TIME2	-.213	.581	.808
PRICE2	.177	.633	1.20
VARIETY2	-1.02	<b>.003***</b>	.360
BULK2	.351	.573	1.42
PRE2	.124	.893	1.13
LOCALFOOD2	.423	.309	1.53
ORGAN2	.164	.690	1.18
LOCALBUS2	.679	<b>.096*</b>	1.97
FAMHEALTH8	.556	.234	1.74
QUALITY8	.335	.473	1.40
TASTE8	.344	.366	1.41
SUPPLOCAL8	.963	<b>.075*</b>	2.62
KNOWFARMER8	.072	.856	1.07
COMMUNITY8	-.255	.508	.775
FOODSAFE8	-.604	.237	.547
ENVCONCERN8	.164	.715	1.18
CONSTANT	-1.06	.428	.346

\*\*\*Chi-square significant at p<.001

Significance: \*\*\*p<.01; \*\*p<.05; \* p<.1

Table 11. Model 2 Statistics, Estimated Coefficients, p-values, and Odds Ratios of the Independent Variables. Dependent Variable: Q≥41%

MODEL STATISTICS			
NUMBER OF OBSERVATIONS	247		
LIKELIHOOD RATIO CHI <sup>2</sup> (27)	78.41***		
PROBABILITY > CHI SQUARED	0.0000		
PSEUDO R-SQUARED	.2291		
VARIABLE	COEFFICIENT	P-VALUE	ODDS RATIO
SEX	.136	.678	1.15
AGE	.013	.243	1.01
EDUC	-.073	.531	.929
INCOME	.021	.802	1.02
HOUSEHOLDSIZE	.001	.995	1.00
MINORS	.175	.561	1.19
COUNTY	.082	.280	1.09
LOCATIONS	-.031	.878	.970
TRIPS	.176	.390	1.19
WINTERPURCHASE	.585	<b>.001***</b>	1.80
CONVEN2	-.107	.748	.900
TIME2	-.526	.168	.591
PRICE2	-.033	.924	.976
VARIETY2	-.817	<b>.014**</b>	.442
BULK2	.392	.472	1.48
PRE2	-.710	.398	.492
LOCALFOOD2	.738	<b>.058*</b>	2.09
ORGAN2	.648	<b>.091*</b>	1.91
LOCALBUS2	.334	.377	1.40
FAMHEALTH8	.587	.161	1.80
QUALITY8	.275	.555	1.32
TASTE8	.016	.965	1.02
SUPPLOCAL8	.171	.744	1.19
KNOWFARMER8	.110	.763	1.12
COMMUNITY8	-.019	.958	.981
FOODSAFE8	.035	.939	1.04
ENVCONCERN8	-.459	.281	.632
CONSTANT	-2.34	.063	.096

\*\*\*Chi-square significant at p<.001

Significance: \*\*\*p<.01; \*\*p<.05; \* p<.1

Table 12. Model 3 Statistics, Estimated Coefficients, p-values, and Odds Ratios of the Independent Variables. Dependent Variable: Q≥51%

MODEL STATISTICS			
NUMBER OF OBSERVATIONS	247		
LIKELIHOOD RATIO CHI <sup>2</sup> (27)	72.26***		
PROBABILITY > CHI SQUARED	0.0000		
PSEUDO R-SQUARED	0.2215		
VARIABLE	COEFFICIENT	P-VALUE	ODDS RATIO
SEX	.280	.408	1.32
AGE	.009	.423	1.01
EDUC	-.185	.128	.830
INCOME	.060	.494	1.06
HOUSEHOLDSIZE	-.140	.554	.869
MINORS	.321	.326	1.38
COUNTY LOCATIONS	.060	.437	1.06
TRIPS	.253	.214	1.29
WINTERPURCHASE	.068	.747	1.07
CONVEN2	.519	<b>.000***</b>	1.68
TIME2	.078	.817	1.08
PRICE2	-.479	.236	.620
VARIETY2	-.083	.815	.920
BULK2	-.880	<b>.011**</b>	.415
PRE2	.154	.773	1.17
LOCALFOOD2	-1.37	.155	.253
ORGAN2	.465	.242	1.59
LOCALBUS2	.600	.125	1.82
FAMHEALTH8	.191	.621	1.21
QUALITY8	.320	.442	1.38
TASTE8	.252	.613	1.29
SUPPLOCAL8	.344	.388	1.41
KNOWFARMER8	-.302	.590	.739
COMMUNITY8	.199	.592	1.22
FOODSAFE8	-.268	.479	.765
ENVCONCERN8	-.153	.733	.858
CONSTANT	.241	.581	1.27
	-2.15	.100	.117

\*\*\* Chi-square significant at p<.001

Significance: \*\*\*p<.01; \*\*p<.05; \* p<.1

The amount of local produce purchased in the winter and variety as an important factor in deciding food shopping locations were the only two variables for which the effects are significant in all three models. Winter purchasing has a positive effect on the probability of

purchasing at or above all three thresholds, while variety has a negative effect on the probabilities. The effects of both organic options and local food options as important factors in deciding shopping location were positive and significant at the 90% confidence interval in Model 2. In Model 1, the effects of supporting local business as a reason for choosing shopping locations and as a reason for purchasing local produce are both significant at the 90% confidence interval and positive. Interestingly, the effect of education is significant at the 95% confidence interval in Model 1, and negative. The rest of this section will first explore the two variables that had statistically significant effects in all three models, followed by a discussion of the other variables with statistically significant effects in Models 1 and 2, and end on an explanation of why the education variable had a statistically significant negative effect in Model 1.

The effect of the amount of local produce purchased during the winter months had a statistically significant effect on the dependent variable in all three models. The effect is positive, meaning the probability of an individual buying at or above the threshold during the rest of the year in each model increases as the amount of local produce purchased during the winter months increases. The odds ratio of 2.01 for *winterpurchase* in Model 1 implies that the odds of a respondent buying at least 31% of their produce locally increases by 100% for every one-unit increase in *winterpurchase*. In Model 2, the odds ratio for *winterpurchase* is 1.80, denoting an 80% increase in the odds of purchasing at least 41% of produce locally during the rest of the year for every one-unit increase in *winterpurchase*. Finally, the odds ratio for *winterpurchase* in Model 3 is 1.68, meaning there is a 68% increase in the odds of purchasing at least 51% of produce locally for every one-unit increase in *winterpurchase*. Because this variable is categorical, a one-unit increase is an increase to the next bracket of local produce purchased. For example, an increase from purchasing 1-10% of produce locally during the winter to purchasing

11-20% of produce locally during the winter. The regression model was run with *winterpurchase* moved to be the dependent variable to determine if there were any variables with significant effects on purchasing higher amounts of local produce during the winter, with *y* being equal to 1 if the respondent purchased 11% or more of their produce locally during the winter and *y* being equal to 0 if they did not. Results showed no variable had significant effects on the amount of local produce purchased during the winter.

The other variable for which the effects are statistically significant in all three models is *variety2*, representing variety as an important factor when deciding food shopping location. The effect of this variable is negative, implying that those who value variety when choosing food shopping locations are less likely to purchase at or above the threshold amounts of local produce in the models. The odds ratio for *variety2* of .360 in Model 1 denotes a 64% decrease in the odds of a respondent purchasing at least 31% of their produce locally if they value variety when choosing their food shopping location. In Model 2, the odds ratio of .442 implies a 55.8% decrease in the odds of purchasing at least 41% of produce locally if the respondent values variety when choosing their food shopping location. Lastly, the odds ratio of .415 in Model 3 translates to a 58.5% decrease in the odds of purchasing at least 51% of produce locally if the respondent values variety when choosing their food shopping location. Interestingly, respondents who value variety are not more or less likely to get local produce from any of the locations asked about in the survey, including farmers markets, directly from producers, or health and natural supermarkets. The amount of local produce purchased at each location as a percent of all local produce purchased is also not very different between respondents who value variety and those who do not, meaning respondents who value variety do not get more of their local produce from stores that have more variety, such as supercenters or supermarkets.

Model 1 contained two additional variables with statistically significant effects at the 0.1 significance level: *localbus2*, which represents supporting local businesses as a determinant of food shopping location, and *supplocal8*, which represents supporting local businesses as a reason for purchasing local produce. While the effects of these two variables are not significant at the preferred levels, these results still have some possible implications. Supporting local business may cause consumers to purchase at least 31% of their produce locally, which was the average amount of local produce purchased by the sample as a whole during the year, excluding winter months. The odds ratios of 1.97 for *localbus2* and 2.62 for *supplocal8* indicate the odds of a consumer purchasing at least 31% of their produce locally increase by 97% if they choose their shopping location based on supporting local businesses, and by 100% if a reason they purchase local produce is to support local business.

Model 2 also contained two variables for which the effects are statistically significant at the 0.1 significance level: *localfood2*, which represents availability of local food options as a determinant of food shopping location, and *organ2*, which represents availability of organic options as a determinant of food shopping location. These results imply consumers who are conscious of nutrition may purchase higher amounts of their produce locally. Local food is often perceived as better for your health and safer, and organic food typically has the same connotations. Health-conscious consumers therefore might purchase above average amounts of their produce locally for these reasons. The odds ratios of 2.09 for *localfood2* and 1.91 for *organ2* indicate the odds of a consumer purchasing at least 31% of their produce locally increase by 100% if they choose their shopping location based on availability of local food options, and by 91%% if they choose their shopping location based on availability of organic options.



The negative effect of an increase in education in Model 1 can be attributed to the small number of respondents who held less than a four year college degree. We can see this effect by looking at the cross-tabulation in Table 13, comparing the distribution of education for the model in which the effect of education is significant and one of the models for which it is not. Education had a statistically significant effect when the dependent variable was *buylocal1*, but not when the dependent variable changed to *buylocal2*. When the dependent variable is *buylocal1*, we can see most respondents in each education level below a four year degree purchase at least 31% of their produce locally. However, there is a more even distribution among those with a four year or graduate degree. More respondents with the two highest levels of education do not purchase at or above the threshold amount of local produce as a percentage of the total number of respondents with those education levels compared to the lower levels of education. When the dependent variable is changed to *buylocal2*, we see closer to a 50-50 split between those who buy at least 41% of their produce locally and those who do not at every education level.

Table 13. Cross-Tabulation of Buylocal1 and Buylocal2 by Education

	<b>BUYLOCAL1</b>		<b>BUYLOCAL2</b>	
	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>
HIGH SCHOOL GRADUATE/GED	1	11	4	8
TECHNICAL SCHOOL/CERTIFICATE PROGRAM	4	6	4	6
SOME COLLEGE	9	34	21	22
2-YEAR DEGREE	4	12	5	11
4-YEAR DEGREE	43	62	59	46
GRADUATE DEGREE	43	68	54	57

*Predicted Probabilities*

The predicted probabilities of the “average” consumer purchasing at or above the threshold in each model was calculated. The results are provided in Table 17. The predicted

probability of the average consumer purchasing at least 31%, 41%, and 51% of their produce locally is 63.6%, 48.6%, and 37.2%, respectively. Further interpretation of these results will be discussed in Chapter VI.

Table 14. Predicted Probabilities

	<b>OBSERVATIONS</b>	<b>MEAN</b>	<b>STD. DEV.</b>
MODEL 1	247	.636	.262
MODEL 2	247	.486	.265
MODEL 3	247	.372	.251

### *Summary of Quantitative Results*

Quantitative results show the only two factors with statistically significant effects on purchasing higher amounts of local produce in all three models are amount of local produce purchased in the winter months and variety as an important factor when choosing food shopping locations. Purchasing more local produce during the winter increases the odds of a consumer buying higher amounts of local produce during the rest of the year. If a consumer values variety when they go food shopping, they are less likely to purchase higher amounts of their produce locally. However, these same consumers are not any more or less likely to get their local produce from a specific location, including supermarkets, health and natural supermarkets, farmers markets, or directly from a producer. The amount of local produce purchased at these locations as a percentage of total local produce purchased also doesn't vary between those who value variety and those who do not. Valuing variety only affects the amount of local produce purchased overall. Additionally, other variables may influence consumers to purchase up to a certain amount of their produce locally. Support of local businesses as a determinant of food shopping location and as a reason for buying local produce may cause consumers to buy at least 31% of their produce locally, which is the average amount purchased by the sample. Valuing

availability of organic and local food options may cause consumers to buy at least 41% of their produce locally.

## CHAPTER VI

### Discussion

#### *Discussion Introduction*

The research presented in this thesis aims to identify the factors that influence New Hampshire consumers to purchase locally grown produce and identify policy recommendations to increase the amount purchased within the state. This chapter will present the results of both the qualitative and quantitative data, and discuss possible implications. The results of both facets will be interpreted, and possible recommendations for increasing local produce purchasing, including policy recommendations, will be discussed. This chapter specifically addresses the potential for increasing the purchasing of locally grown produce in the state of New Hampshire. The chapter will end with an explanation of the limitations of this research and concluding statements, which will mark the completion of this thesis.

#### *The Local Produce Consumer*

The existence of self-selection bias is evident with this sample. Similar to the results of Werner et al. (2019), there was an oversampling of older individuals, individuals with high incomes, and individuals with a four year or graduate degree. Despite the sample invited to participate in Werner et al.'s survey was truly random, the low response rate and evidence of the sample having an interest in local food implies self-selection bias in their sample as well. The majority of our sample is local food purchasers, with a high average amount of local produce purchased as a percentage of total produce purchased. Like Werner et al., we therefore assume the findings of this research represent the opinions and characteristics of those who currently purchase above average amounts of local produce. Based on this sample and the sample of

Werner et al., it is implied that the average consumer of local produce in the state is older, more educated, and has a higher income than the general population.

A majority of local produce consumers frequent more than one location to shop for food, with 82% of the sample reported shopping at two or more locations. They also shop for food more than once per week, with 57.9% of the sample reporting shopping for food two or more times weekly. Based on the results of the focus groups, it can be assumed the primary location for food shopping is a supermarket, and the secondary location is related to local food shopping. Over half of the respondents shop at farmers markets for local produce (56.1%), and 56.9% get local produce directly from producers. Additionally, 29.7% of the sample gets local produce from both sources. These results show that 83.3% of local produce consumers get local produce from farmers markets and/or directly from producers. This implies that a large majority of local produce consumers seek out sources that aren't traditional food shopping locations, such as supermarkets. Of the non-local produce consumers, the distribution of results regarding number of shopping locations was evenly spread, with one-third shopping at one location, two locations, and three locations.

The most common factor respondents take into consideration when choosing food shopping locations is price. However, price did not prove to be a significant factor in determining the amount of local produce one purchases, nor was price of importance in the willingness to pay responses of the survey. Compared to previous literature, the WTP responses collected were unusually high. A surprising number of respondents selected the highest premium given of 25% for each type of produce, implying that at least some of those consumers would be willing to pay even more than 25% for the local options. A large majority of respondents were willing to pay at least a 5% premium for each type of produce, indicating that a small premium

would not drastically decrease consumption of local produce among those who already purchase it. However, while a premium of some sort is acceptable to those who already purchase local produce, it would most likely be another deterrent to consumers who do not currently purchase local produce.

A higher percentage of non-local produce consumers value price compared to local produce consumers. Of the non-local produce consumers, 81% value price, while 65% of local produce consumers value it. Keeping in mind the small sample size, this finding may or may not hold true with a larger sample. However, the fact that most non-local produce consumers will frequent multiple food shopping locations does imply that lower prices may encourage them to purchase local produce, as location is potentially not a deterrent. A majority of the non-local produce consumers also stated that convenience was an important factor in determining shopping location (85.7%). While the survey did not ask the types of locations the non-local produce consumers frequent, this information would be useful in determining how to give this group more convenient access to local produce options. Finally, 81% of non-local produce consumers do not consider local food options or supporting local business when selecting food shopping locations. It may be possible to convince these consumers to buy local produce if they were more aware of the benefits of supporting local businesses and consuming local food.

### *Perceptions of Local Produce*

Purchasing of local produce may be dependent on one's perceptions of local produce itself. A much larger percentage of the local produce buyers stated they feel local produce is fresher, tastes better, and is superior in appearance compared to the non-local produce buyers. These results bring into question perceived versus real benefits. Qualities like taste and appearance are subjective, but results of the survey show more local produce buyers think local

produce is superior in these regards compared to non-local produce buyers. Freshness of the produce can be proven, and is one aspect of local produce that consumers can be educated on to inform purchasing decisions. Additional aspects that would benefit from consumer education tactics are food safety and environmental impact. A high number (28.6%) of non-local produce consumers are unsure if local produce is safer than non-local produce, or has less of an environmental impact. These consumers may purchase local produce if they believed it to be safer or more environmentally friendly.

Additional areas that show potential for better consumer education include the use of pesticides in the growing of produce, potential for food-borne illnesses, and potential for long-term health issues. Local produce consumers had higher levels of concern in all three areas for both local and non-local produce, with the exception of the risk of food-borne illnesses in local produce. These results indicate local produce consumers have a greater awareness of food safety issues, and pay more attention to these traits. Of the non-local consumers, 57.1% were at least somewhat concerned about pesticide use in non-local produce, and 61.9% were concerned about the risk of food-borne illness in non-local produce. Additionally, 38.1% were concerned about the same risks in local produce. Education about the safety of local produce compared to non-local produce may convince some of these consumers to purchase local.

#### *Why do New Hampshire Consumers Buy Local Produce?*

While the quantitative results of this research did not provide much insight into what factors determine how much produce consumers purchase locally, the qualitative results provide a wealth of information on why consumers purchase local produce in general. In addition to being less concerned about pesticide use, the risk of food-borne illnesses, and the risk of long-term health effects with local produce compared to non-local produce, there are a variety of

reasons consumers choose local over non-local. Results of the survey reveal that social capital is important to local produce consumers. The Organization for Economic Co-Operation and Development (OECCD) (2007) defines social capital as “the links, shared values and understandings in society that enable individuals and groups to trust each other and so work together” (p. 102). Of the local food consumers, 87.3% stated that supporting local farms is one of the reasons for purchasing local produce, 53.3% said they purchase local for the sense of community, and 32% said knowing the farmer is a reason they purchase local. These three reasons all relate to the idea of social capital, as they are human-related rather than being related to the produce itself. Gao et al. (2012) found that the social amenities provided by farmers markets are potentially more important than their function as a place for money-product exchanges. Many respondents in their study enjoyed the atmosphere provided by farmers markets and felt they were a good place for socializing. The importance of local food and related settings provide desirable social capital, as evident by results from this survey and related studies like the one done by Gao et al.

### *Barriers to Purchasing Local Produce*

The most obvious barrier to purchasing local produce is the seasonality of its availability in New Hampshire. A majority of local produce consumers stated this as the main reason they do not purchase more local produce (63%). As discussed in Chapter IV, the quantities of local produce purchased in the winter were dramatically lower than the quantities purchased during the rest of the year, with a majority of consumers only purchasing 1-10% of their produce locally during the winter. Not only are many types of produce unavailable in the winter, but there are fewer locations from which to purchase local produce. Many farmers markets and direct-from-producer sources are not available in the winter. The few winter farmers markets in the state



usually operate once a month, and have fewer vendors present than farmers markets during the rest of the year. It can be assumed there is demand for more availability of local produce during these months, however there would need to be cost-benefit analyses conducted to determine if it would make financial sense for producers to expand their production during the winter.

Producing in the winter months can be a costly endeavor with few options, such as purchasing heated greenhouses.

Among non-local produce consumers, the COVID-19 pandemic was provided as a reason some of them did not purchase any local produce in the past 12 months. Since this was cited as the main reason for not purchasing any, it can be assumed that they would purchase at least some of their produce locally if there weren't a pandemic. Unfortunately, due to the small sample size there is not a clear reason why most non-local produce consumers do not purchase it. The answers were somewhat evenly spread between lack of availability, price, and farmers market and farm stand hours of operation and location. Only one respondent stated that they did not want to purchase local produce. Knowing this, it can be assumed that most non-local produce buyers are not against purchasing local produce, and can be persuaded in some way to purchase it.

### *Information on Local Produce*

The majority of respondents want more information about local produce (81.3%), including 66.7% of the non-local produce consumers. Providing better information about local produce has major potential to increase consumption in the state. A majority of respondents get information about local produce by word of mouth (59.5%), while other methods of getting information had relatively low frequencies. Almost half of respondents want to get more information about local produce at the local level (44.5%). Of these respondents, 32.4% want to

be able to get more information from town websites, and 29.3% want to be able to get more information from local event calendars. These were the top two answers given when respondents were asked where they want to get more information about local produce. These results build on the previously mentioned idea of social capital; individuals want their community to work together to share information and values. Additionally, 26.5% of respondents would like to get more information from social media, and 24.6% would like more information from email newsletters. Combining all four of these forms of sharing information would create an effective and wide-reaching system at both the local and state levels.

### *Discussion of Quantitative Results*

The logit model used in this research included a variety of variables, including demographic information, general food shopping traits and priorities, and reasons for purchasing local produce. The model was run three times, with the threshold of the dependent variable *buylocal* increasing each time. *Buylocal* was a dummy variable and represented the amount of local produce a respondent purchases during the year, excluding the winter months. Model 1 had a threshold of 31%, Model 2 had a threshold of 41%, and Model 3 had a threshold of 51%.  $y = 1$  if a respondent purchased at or above the threshold. Only two explanatory variables, *winterpurchase* and *variety2* proved to have statistically significant effects at all three thresholds used for the dependent variable. *Winterpurchase* represented the amount of local produce purchased during the winter months, while *variety2* represented variety of products as an important factor when deciding food shopping location. No demographic factors proved to have significant effects on the amount of local produce purchased, similar to the findings of Bond et al. (2009) and Brown (2003).

The statistically significant effect of the amount of local produce purchased in the winter was expected. Because local produce is difficult to find during the winter months due to seasonality, it requires more effort to find during this time. If a consumer is willing to put in the effort to seek out local produce during the winter months, it makes sense they would purchase a higher amount of local produce during the rest of the year, when it is easier to find. The odds ratios in Model 1, Model 2, and Model 3 denoted increases of 100%, 80%, and 68% in the odds of a consumer purchasing at or above the thresholds for each one-unit increase in *winterpurchase*, respectively. These results indicate that consumers who seek out locally grown produce during the winter months have a strong interest in local produce overall, and buy more local produce than the average New Hampshire consumer.

The statistical significance of the effects of variety as an important factor when deciding food shopping location presented a bit of a conundrum. The effect of this variable was negative in all three models, representing a decrease in the likelihood that a consumer who values variety of options when food shopping will purchase higher amounts of local produce is less than those who do not take variety of options into consideration. The odds ratios in Model 1, Model 2, and Model 3 denoted decreases of 64%, 31%, and 55.8% in the odds of a consumer purchasing at or above the thresholds if the consumer values variety, respectively. Based on these results, one could assume that the reason consumers who value variety purchase less local produce would be because they frequent locations such as supercenters or supermarkets, known to have a wider variety of options compared to farm stands or farmers markets but less availability of local produce. However, further analysis revealed respondents who value variety were no more or less likely to get local produce from any of the locations inquired about in the survey, including farmers markets and directly from producers. There was also no difference in the amount of local

produce purchased at each location as a percentage of all local produce purchased between the two groups. The only difference is the overall amount of local produce purchased; however, it is unable to be determined why this is with the information collected. Using the predicted probabilities from the models, the predicted probability of a consumer that does not value variety of purchasing at least 31% of their produce locally is 73%, while the predicted probability of a consumer that does value variety of purchasing at least 31% of their produce locally is 54.4%. We see this trend at the highest threshold tested as well. The predicted probability of a consumer purchasing at least 51% of their produce locally is 29.6% if the consumer values variety, compared to 45% if they do not. Some possible reasons for this anomaly is the definition of variety itself. It is possible to interpret variety as having many different items to choose from, or having many different kinds of one item to choose from. This may explain why consumers who value variety still shop at farmers markets; while there are not many different variations of the same item available, there are many different items available. Another possible explanation for the results is the existence of the pandemic. Consumers may shop at locations they do not normally frequent to avoid crowded supermarkets.

Additionally, there may be factors that influence consumers to buy a certain amount of their produce locally. Support of local businesses as a determinant for choosing food shopping location and as a reason for purchasing local produce may cause consumers to buy at least 31% of their produce locally, which was the average amount of local produce purchased by the sample during the year, excluding winter months. This result implies that supporting local business may only cause consumers to purchase some of their produce locally, but isn't a reason consumers will buy a majority of their produce locally. Health-conscious consumers may purchase more local produce, as results indicate consumers who value availability of organic and

local food options at their shopping locations purchase are more likely to purchase at least 41% of their produce locally. It is possible that because of the perceived health benefits many individuals have of local and organic produce, consumers may buy more local produce if they are concerned about the health benefits their food provides.

### *Recommendations*

The first recommendation to increase purchasing of local produce within the state is to increase its availability, particularly in the winter months. Among the local produce consumers, 63% cited seasonality as the main reason they do not purchase more local produce overall. Increasing the presence of winter farmers markets and supporting winter farming activities would help meet this currently unmet demand. Very few individuals in this survey stated that they did not want to purchase local produce or that they purchase all the local produce they want. This implies unmet demand among current local produce consumers, and the potential to increase demand among consumers who do not currently purchase local produce or who purchase very low amounts of it. Increasing availability of local produce in the most common food shopping locations, such as supermarkets, has the potential to increase consumption among consumers who do not currently buy local produce. The predicted probability of the average consumer who shops at one or two locations for their food of purchasing at least 31% of their produce locally is 61.4%, which falls to 34.2% when the minimum amount is increased to 51%. The predicted probability of the average consumer who shops at three or more locations for food purchasing at least 31% of their produce locally is 75.6%, which decreases to 53.8% when the minimum amount is increased to 51%. The differences in these results may represent a need to increase availability of local produce in the most common food shopping locations to target consumers who do not shop at multiple locations. Finally, continuing to expand availability of

local produce in the state to SNAP participants would likely see an increase in consumption as well, as the few SNAP participants in this survey show they do purchase local produce despite findings in other research.

The second recommendation relates to educating consumers. There are several areas that require better education: identification of local produce, real benefits of local produce, and comparisons between local and non-local produce. The ability to better locate and identify local produce would encourage consumers to choose the local option over the non-local option. The combination of increased availability in common food shopping locations and better advertising of local options would help form more educated decision making. Marketing relating to the real benefits of local produce may influence consumers to purchase it. Being able to identify which option is fresher or more environmentally friendly would likely encourage consumers to choose the local option. More information on the potential long-term effects, such as those relating to health, of the food we eat may also encourage local purchasing. Consumers who stated they are at least somewhat concerned about the risk of long-term health effects relating to non-local produce had a predicted probability 16-18% higher than those who expressed little no to concern to purchase at or above the threshold in each model. This implies consumers who are more aware of the health effects of food are more likely to purchase greater amounts of their produce locally.

Lastly, the value of building social capital is an area that should be further studied. The predicted probabilities of the average respondent who values supporting local businesses were higher than the average respondent who does not in all three models. The predicted probability of the average consumer who values supporting local business buying at least 31% of their produce locally is 77.4%, compared to 53.2% for the average consumer who does not value supporting local business. When comparing respondents who stated that sense of community is a reason for

purchasing local produce to those that did not, the average predicted probability is 10% higher across the three models for the former group. These results indicate that consumers who value their community and supporting the businesses in it consume more local produce on average. Policies and initiatives targeting expansion of infrastructure that supports social capital would increase consumption of local produce in those communities.

### *Limitations of This Research*

While this research provides valuable insight into consumer decision making regarding local produce in New Hampshire, there are several limitations of note to this work. First, there was evident self-selection bias among the sample who took the survey. While the University of New Hampshire Survey Center's Granite State Panel is representative of the state population, those who chose to take the survey seem to mostly be individuals with an above-average interest in local food. This is demonstrated by the large number of respondents who had purchased local produce in the past 12 months, and the high average amount of local produce purchased as a percentage of all produce purchased. The small number of statistically significant variable effects in the quantitative results also imply the sample consists mostly of local food consumers who do so due to a strong interest in local food and not because of any other factors that have been significant in similar studies. Secondly, there was oversampling of older individuals, individuals with high incomes, and individuals with a four year college degree or a graduate degree, as discussed above. Thirdly, the existence of the COVID-19 pandemic likely impacted results of this research in some way. The effects of the pandemic on the purchasing of local produce in the state will be explored in future research. Despite these limitations, this study still provides important information about consumers who purchase local produce in the state, as described in this chapter.

### *Concluding Statements*

Expansion of local food production and consumption has been of great interest in the past several years, with many consumers becoming increasingly curious about where their food comes from. In this study, we investigate the factors that influence New Hampshire consumers to purchase local produce. The methods used expanded upon previous literature by introducing three threshold parameters to define consumers who purchase above average amounts of their produce locally. The model estimates revealed that consumers who purchase significant amounts of their produce locally are not driven by any specific policy-relevant factors, and may instead purchase greater amounts of local produce due to indirect benefits and attributes, such as those relating to social capital. This leads to exploration of additional factors that may influence consumption.

The qualitative results of this study paint an interesting picture of the typical local produce consumer in the state. The summary statistics reveal that the importance of social capital is not to be underestimated, proven by comparison of the predicted probabilities relating to several aspects of social capital. Social capital is not something that can be easily tested quantitatively, however this research has begun to touch upon its relation to the consumption of local produce. Consumers of local produce who value aspects of social capital consume more local produce, on average. This is also true of consumers who shop at multiple locations for food, implying the need for increased availability of local produce in commonly frequented food shopping locations. Additionally, there is demand for increased availability of local produce during the winter months, as evident by the prominence of seasonality as the main barrier to purchasing more local produce. The qualitative results also highlight the desire for more information about local produce from consumers who do not currently purchase local produce, as



well as those who do. There is a desire for this information at a local level, with many consumers wanting to find this information through their town government or local event calendars. This desire for more involvement at the local level highlights the desire for the building of social capital; consumers want their community and those who run it to share the interest of buying local.

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## APPENDICES

### Appendix A – IRB Focus Group Approval Letter

University of New Hampshire  
Research Integrity Services, Service Building  
51 College Road, Durham, NH 03824-3585  
Fax: 603-862-3564

15-Sep-2020

**IRB #:** 8380

**Study:** Factors Affecting Purchase of Locally Grown Produce: A Case Study of New Hampshire Markets

**Approval Date:** 15-Sep-2020

The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved the protocol for your study as Expedited as described in Title 45, Code of Federal Regulations (CFR), Part 46, Subsection 110(b). Approval is granted to conduct your study as described in your protocol.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the attached document, *Responsibilities of Directors of Research Studies Involving Human Subjects*. (This document is also available at <http://unh.edu/research/irb-application-resources>.) Please read this document carefully before commencing your work involving human subjects.

Note: IRB approval is separate from UNH Purchasing approval of any proposed methods of paying study participants. Before making any payments to study participants, researchers should consult with their BSC or UNH Purchasing to ensure they are complying with institutional requirements. If such institutional requirements are not consistent with the confidentiality or anonymity assurances in the IRB-approved protocol and consent documents, the researcher may need to request a modification from the IRB.

Upon completion of your study, please complete the enclosed Study Final Report form and return it to this office along with a report of your findings.

If you have questions or concerns about your study or this approval, please feel free to contact Melissa McGee at 603-862-2005 or [melissa.mcgee@unh.edu](mailto:melissa.mcgee@unh.edu). Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,



Julie F. Simpson Director

## Appendix B – NVivo Codebook

# Focus Group Data

## Codes

Name	Description
Barriers	Barriers to purchasing local produce
Seasonality	Child node; seasonality as a barrier to purchasing
COVID	COVID-19 comments relating to local produce
Factors When Shopping	Factors of importance when food shopping
Information about Local Produce	Where information about local produce is acquired and where more is wanted from
Local Benefits	Benefits of purchasing local produce
Shopping Locations	Information relating to where participants food shop

**Appendix C – IRB Request for Modification Approval Letter**

University of New Hampshire  
Research Integrity Services, Service Building  
51 College Road, Durham, NH 03824-3585  
Fax: 603-862-3564

11-Mar-2021

Strater, Jordan  
Natural Resources and the Environment, James  
Hall 56 College Road  
Durham, NH 03824

**IRB #:** 8380

**Study:** Factors Affecting Purchase of Locally Grown Produce: A Case Study of New Hampshire Markets

**Modification Approval Date:** 10-Mar-2021

**Modification:** Addition of Survey

The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved your modification to this study, as indicated above. Further changes in your study must be submitted to the IRB for review and approval prior to implementation.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the document, *Responsibilities of Directors of Research Studies Involving Human Subjects*. This document is available at <http://unh.edu/research/irb-application-resources> or from me.

Note: IRB approval is separate from UNH Purchasing approval of any proposed methods of paying study participants. Before making any payments to study participants, researchers should consult with their BSC or UNH Purchasing to ensure they are complying with institutional requirements. If such institutional requirements are not consistent with the confidentiality or anonymity assurances in the IRB-approved protocol and consent documents, the researcher may need to request a modification from the IRB.

If you have questions or concerns about your study or this approval, please feel free to contact Melissa McGee at 603-862-2005 or [melissa.mcgee@unh.edu](mailto:melissa.mcgee@unh.edu). Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,



Julie F.  
Simpson  
Director



## Appendix D – New Hampshire Consumer Survey



# University of New Hampshire

Dear participant,

You have been invited to participate in a research study about consumer decision making regarding local produce in New Hampshire. The research is being conducted by Jordan Strater, a Masters student in the Department of Natural Resources and the Environment at the University of New Hampshire.

This consent form describes the research study and helps you to decide if you want to participate. It provides important information about what you will be asked to do in the study, about the risks and benefits of participating in the study, and about your rights as a research participant. You should:

- Read the information in this document carefully, and ask the research personnel any questions, particularly if you do not understand something.
- Not agree to participate until all your questions have been answered, or until you are sure that you want to.
- Understand that your participation in this study involves you to complete a survey through Qualtrics that will take approximately 10 to 15 minutes.
- Understand that the potential risks of participating in this study are minimal.

Your answers will be combined with approximately 300 participants in this study. You must be at least 18 years old to participate in this study, a resident of New Hampshire, and the primary food purchaser in your household.

If you agree to participate in this study after reading this document, you will be asked to complete a survey with four sections that will ask you about your shopping habits, thoughts on local produce, and basic demographic information. Participants will be entered to win prizes in the Granite State Panel's quarterly drawings.

Although you are not anticipated to receive any direct benefits from participating in this study, the benefits of the knowledge gained are expected to be helpful to a variety of stakeholders and will assist them with strengthening New Hampshire's agriculture industry as well as the local economy.

Taking part in this study is completely voluntary. You may choose not to take part at all. If you agree to participate, you may refuse to answer any question. If you change your mind, you may stop participating at any time. Any data collected as part of your participation will remain part of the study records. If you decide not to participate or if you stop participating at any time, you will not be penalized or lose any benefits for which you would otherwise qualify.

Further, any communication via the internet poses minimal risk of a breach of confidentiality. To help protect the confidentiality of your information, the University of New Hampshire Survey Center will keep the data in secured files. The UNH Survey Center will provide de-identified data to the project researchers. Individuals who will have access to the de-identified data will be Jordan Strater, UNH masters student and the primary researcher, John Halstead, Department of Natural Resources and the Environment and the project advisor, Scott Lemos, Peter T. College of Business and Economics and a committee member to this project, and Catherine Ashcraft, Department of Natural Resources and the Environment and a committee member to this project. Data may be used for future studies. Data will be used in Jordan Strater's masters thesis, and may be used in reports, presentations, and publications.

If you have any questions about this research project or would like more information before, during, or after the study, you may contact John Halstead, Department of Natural Resources and the environment at [john.halstead@unh.edu](mailto:john.halstead@unh.edu). If you have questions about your rights as a research subject, you may contact Melissa McGee in UNH Research Integrity Services at 603-862-2005 or [Melissa.McGee@unh.edu](mailto:Melissa.McGee@unh.edu) to discuss them.

- Click here if you consent to participate in the research study.
- Click here if you decline to participate in the research study.

Are you at least 18 years old?

- Yes
- No

Are you a New Hampshire resident?

- Yes
- No

Are you the primary food purchaser in your household?

- Yes
- No

Section A: This section will ask you questions regarding your household's food purchasing habits.

1. At how many different locations do you usually do your food shopping?

- One
- Two
- Three
- More than three
- Don't know/Not sure

2. What determines where you do your food shopping? PLEASE CHECK ALL THAT APPLY.

- Convenience
- Time
- Price
- Variety
- Availability of bulk items
- Availability of pre-made/pre-cooked meals
- Local food options
- Organic and/or healthy options
- Support local businesses
- Other (Please specify)
- None of the above

3. On average, how many times per week do you shop for food?

- Once
- Twice
- Three times
- Four or more times
- Don't know/Not sure

Section B: This section will ask you questions regarding what you know and what you think about local produce, and your household's food purchasing habits relating to local produce.

Please use the following definitions for this survey:

**Local produce:** Any fruit or vegetable grown within the New England (Vermont, Maine, Massachusetts, Connecticut, Rhode Island, and New Hampshire) region.

**Non-local produce:** Any fruit or vegetable grown outside of the New England (Vermont, Maine, Massachusetts, Connecticut, Rhode Island, and New Hampshire) region.

4. Please indicate below how you would compare local produce to non-local produce for the following characteristics. (For example, you find the **freshness of local produce is \_\_\_\_\_ compared to non-local produce**):

	Inferior	Somewhat Inferior	About the Same	Somewhat Superior	Superior	Unsure
Freshness	1	2	3	4	5	6
Taste	1	2	3	4	5	6
Appearance	1	2	3	4	5	6
Availability	1	2	3	4	5	6
Food safety	1	2	3	4	5	6
Environmental impact	1	2	3	4	5	6
Health benefits	1	2	3	4	5	6

4a. How concerned are you about the following when it comes to **local produce**?

	Very Concerned	Somewhat Concerned	Not Very Concerned	Not At All Concerned	Don't Know/Not Sure
Use of pesticides	1	2	3	4	5
Risk of potential food-borne illnesses	1	2	3	4	5
Risk of potential long-term health issues	1	2	3	4	5

5. Have you purchased any **locally grown** produce in the past 12 months?

- Yes
- No
- Don't know/Not sure

Condition: No Is Selected. Skip To: Question 10

Condition: Don't know/Not sure Is Selected. Skip To: Question 10

6. About what percentage of the total produce purchased by your household do you estimate was **locally grown produce**? Please divide your answer into winter months and the rest of the year:

Winter months:

- 1-10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 51-60%
- 61-70%
- 71-80%
- 81-90%
- 91-100%

Rest of the year:

- 1-10%
- 11-20%
- 21-30%
- 31-40%
- 41-50%
- 51-60%
- 61-70%
- 71-80%
- 81-90%
- 91-100%

7. About what percentage of the **locally grown produce** do you estimate came from the following sources? Please write a percentage for each between 0-100%.

\_\_\_\_\_ Supermarket (e.g. Market Basket, Hannafords)

\_\_\_\_\_ Supercenter (e.g. Walmart, Target)

\_\_\_\_\_ Health/Natural Supermarket (e.g. Trader Joe's, Whole Foods)

\_\_\_\_\_ Farmers Markets

\_\_\_\_\_ Farm Store

\_\_\_\_\_ Direct from Producer (e.g. Farm Stand, Community Supported Agriculture (CSA))

\_\_\_\_\_ Home or Community Garden

\_\_\_\_\_ Neighbor or Friend's Garden

\_\_\_\_\_ Other (Please Specify)

8. Which of the following are reasons you purchased any **locally grown produce** in the past 12 months? (Please select all that apply)

My family's health

Quality of the produce

Tastes better

Support local farms

Knowing the farmers

Sense of community

Food safety concerns

Concern for the environment

Other (Please Specify)

None of the above

9. What is the main reason you haven't purchased more **locally grown produce** in the past 12 months?

- Seasonality
- Price
- Farm Stand/Farmers Market hours of operation and/or location
- I do not know where to find more of it (lack of information)
- Other (Please Specify)
- I already buy all the locally grown produce I want

Display This Question: If answer to question 5 is not Yes

10. What is the main reason that you haven't purchased **locally grown produce** in the past 12 months?

- Price
- Farm Stand/Farmers Market hours of operation and/or location
- I do not know where to find it (lack of information)
- Lack of availability
- Other (Please Specify)
- I do not wish to purchase locally grown produce

11. Has the COVID-19 pandemic changed how you do your food shopping in any of the following ways?

- Take fewer number of shopping trips
- Use grocery delivery or curbside pickup
- Purchase cheaper items
- Purchase more in bulk
- Purchase more pre-packaged/pre-cooked meals
- Other (Please Specify)
- None of the Above



12. Are you buying more or less **locally grown produce** due to the COVID-19 pandemic?

- Much more
- Somewhat more
- About the same amount
- Somewhat less
- Much less
- Don't know/Not sure

Display This Question: If answer to question 12 is Somewhat less or Much less

13. What are the reason(s) you have bought less **locally grown produce** during the COVID-19 pandemic?

- Can no longer afford it
- Can't find it anymore/fewer sources
- Switched to grocery delivery
- Don't have time to worry about it anymore
- No longer a priority
- Other (Please Specify)
- None of the above

14. Where do you typically get information about **locally grown produce**? (Please select all that apply)

- Social media (e.g. Facebook, Instagram, Twitter)
- Newspaper ads
- Email newsletter
- Road signs
- Through town websites
- Local event calendars
- Word of mouth
- Other (Please specify)
- None of the above

15. Where do you wish you could get more information about **locally grown produce**? (Please select all that apply)

- Social media (e.g. Facebook, Instagram, Twitter)
- Newspaper ads
- Email newsletter
- Road signs
- Through town websites
- Local event calendars
- Word of mouth
- Other (Please specify)
- I do not want more information about local produce

16. Which of the following would make you more likely to purchase **locally grown produce**? (Please select all that apply)

- More availability at supermarkets and/or supercenters
- Better signage in stores
- More information on the benefits of local produce
- Billboards or road-way signs with locations of farmers markets and farm stands
- Lower prices
- Other (Please specify)
- None of the above

Section C: This section will ask you to evaluate potential premiums for five different types of local produce.

17. Beefsteak tomatoes that are **NOT locally grown** cost an average of \$3.69 per pound. For **locally grown** beefsteak tomatoes, the **most** you would be willing to pay is:

- \$3.69 per pound
- \$3.87 per pound
- \$4.06 per pound
- \$4.24 per pound
- \$4.43 per pound
- \$4.61 per pound
- I would not purchase at the lowest price given (too expensive)
- I do not like/wish to purchase this item

18. Carrots that are **NOT locally grown** cost an average of \$0.88 per pound. For **locally grown** carrots, the **most** you would be willing to pay is:

- \$0.88 per pound
- \$0.92 per pound
- \$0.97 per pound
- \$1.01 per pound
- \$1.06 per pound
- \$1.10 per pound
- I would not purchase at the lowest price given (too expensive)
- I do not like/wish to purchase this item

19. Snap peas that are **NOT locally grown** cost an average of \$5.31 per pound. For **locally grown** snap peas, the **most** you would be willing to pay is:

- \$5.31 per pound
- \$5.58 per pound
- \$5.84 per pound
- \$6.11 per pound
- \$6.37 per pound
- \$6.64 per pound
- I would not purchase at the lowest price given (too expensive)
- I do not like/wish to purchase this item

20. Strawberries that are **NOT locally grown** cost an average of \$4.63 per pound. For **locally grown** strawberries, the **most** you would be willing to pay is:

- \$4.63 per pound
- \$4.86 per pound
- \$5.09 per pound
- \$5.32 per pound
- \$5.56 per pound
- \$5.79 per pound
- I would not purchase at the lowest price given (too expensive)
- I do not like/wish to purchase this item

21. Green beans that are **NOT locally grown** cost an average of \$2.55 per pound. For **locally grown** green beans, the **most** you would be willing to pay is:

- \$2.55 per pound
- \$2.68 per pound
- \$2.81 per pound
- \$2.93 per pound
- \$3.06 per pound
- \$3.19 per pound
- I would not purchase at the lowest price given (too expensive)
- I do not like/wish to purchase this item

Section D: In this final section, we are going to ask some basic household information to assist our analysis. As stated above, all responses given in this survey are anonymous.

Display This Question: If DEMOS\_needed\_gender is Equal to 1

22. Which of the following best describes your gender?

- Woman
- Man
- Transgender
- Gender Non-Conforming/Other
- Prefer not to say

Display This Question: If DEMOS\_needed\_age is Equal to 1

23. What is your age? \_\_\_\_\_

24. What is the highest level of education you have completed?

- Did not graduate high school
- High school graduate/GED
- Technical school/certificate program
- Some college education
- 2-year college degree
- 4-year college degree
- Graduate degree

25. What was the total income of your household (before taxes) last year?

- Less than \$15,000
- \$15,000 - \$29,999
- \$30,000 - \$44,999
- \$45,000 - \$59,999
- \$60,000 - \$74,999
- \$75,000 - \$89,999
- \$90,000 - \$104,999
- \$105,000 or more
- Prefer not to say

26. Including yourself, how many individuals live in your household? \_\_\_\_\_

27. How many individuals living in your household are under 18? \_\_\_\_\_

28. In which town do you live? \_\_\_\_\_

Display This Question: If DEMOS\_needed\_race\_african\_black\_carib is Equal to 1

OR DEMOS\_needed\_race\_asian\_pacisland is Equal to 1

DEMOS\_needed\_race\_caucasian\_white is Equal to 1

DEMOS\_needed\_race\_latin\_hispanic is Equal to 1

DEMOS\_needed\_race\_other is Equal to 1

29. Which of the following ethnic or racial groups do you identify with? (Please select all that apply)

- Native American, Inuit, or Aleut
- Asian American/Pacific Islander
- African American/Black/Caribbean American
- Caucasian/White
- Latin/Hispanic
- Other (Please specify)
- Prefer not to say

30. Are you a participant in SNAP (Supplemental Nutrition Assistance Program)?

- Yes
- No

Display This Question: If DEMOS\_needed\_party\_registration is Equal to 1

31. Are you registered to vote at your current address?

- Yes
- No
- Don't know/Not sure

Display This Question: If answer to question 31 is Yes

32. And what are you registered as?

- Registered Democrat
- Registered Independent/Unaffiliated/Undeclared
- Registered Republican
- Registered Other
- Don't know/Not sure

Display This Question: If DEMOS\_needed\_party\_affiliation is Equal to 1

33. Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or something else?

- Democrat
- Independent
- Republican
- Other Party
- Don't know/Not sure

Display This Question: If answer to question 33 is Democrat

34. Would you call yourself a strong Democrat or a not very strong Democrat?

- Strong Democrat
- Not very strong Democrat

Display This Question: If answer to question 33 is Independent, Other party, or Don't know/Not sure

35. Which party do you think of yourself as closer to?

- Republican Party
- Democratic Party
- Neither
- Don't know/Not sure

Display This Question: If answer to question 33 is Republican

36. Would you call yourself a strong Republican or a not very strong Republican?

- Strong Republican
- Not very strong Republican

Display This Question: If DEMOS\_needed\_presvote\_2020 is Equal to 1

37. In the election for President in 2020 did you vote for Donald Trump, Joe Biden, Jo Jorgensen, someone else, or did you skip the election?

- Donald Trump
- Joe Biden
- Jo Jorgensen
- Someone else
- Did not vote
- Don't know/Not sure

Thank you for completing this survey.

Version: 01