

Consumer Willingness-to-Pay for Sweet Grown Alabama Sweet Potatoes

by

Julia Holley

A thesis submitted to the Graduate Faculty of
Auburn University
in partial fulfillment of the
requirements for the Degree of
Master of Science

Auburn, Alabama
August 5, 2023

Copyright 2023 by Julia R. Holley

Approved by

Wendiam Sawadgo, Chair, Assistant Professor, Agricultural Economics and Rural Sociology
Joshua M. Duke, Department Head, Agricultural Economics and Rural Sociology
Adam Rabinowitz, Assistant Professor, Agricultural Economics and Rural Sociology
Samir Huseynov, Assistant Professor, Agricultural Economics and Rural Sociology

Abstract

In this study, we capture consumer willingness to pay for differently labeled and sourced sweet potatoes at Alabama farmers markets using an incentive-based experiment. Data were collected at farmers markets in four metropolitan areas across Alabama during the fall of 2022. The experiment utilized the Becker-DeGroot-Marschak (BDM) mechanism for consumer valuation. We find that on average, respondents are willing to pay \$6.77 for a basket of sweet potatoes from a farm in Alabama that participates in the Sweet Grown Alabama program, \$5.72 for a basket of sweet potatoes from an Alabama farm, \$4.78 for a basket of sweet potatoes from a farm in Mississippi, and \$4.16 for a basket of sweet potatoes from a farm in the US that is not in Alabama. This suggests that, on average, farmers market consumers are willing to pay \$1.56 more for a basket of Alabama sweet potatoes relative to a basket of sweet potatoes from a farm in the US but not from Alabama. Furthermore, farmers market consumers are willing to pay an additional \$1.05 for sweet potatoes with a Sweet Grown Alabama label compared to sweet potatoes grown in Alabama. Interestingly, we found that overall familiarity with the Sweet Grown Alabama program was low among participants, but this did not affect the premium of the brand, as familiarity with Sweet Grown Alabama did not have a statistically significant effect on its price premium. The price premium for a basket of sweet potatoes with the Sweet Grown Alabama logo over a basket that is from Alabama but does not carry the logo, and the price premium for a basket of sweet potatoes from Alabama over a basket from the US outside of Alabama were investigated. Having a higher household income and higher education level both positively impacted the price premia for Sweet Grown Alabama and Alabama sourced sweet potatoes. Our results provide insight to consumer preferences for local food and quantify a premium for Alabama's state labeling program, Sweet Grown Alabama. This study is expected

to positively impact future research for state marketing programs as well as Sweet Grown Alabama's future marketing promotions. Farmers interested in learning about consumer trends for locally labeled food would also benefit from these findings.

Acknowledgments

I would like to thank everyone in my thesis committee for all their help; specifically, my research advisor, Dr. Wendiam Sawadgo. I have enjoyed working on this project with you and appreciate all your contributions.

Thank you, Kassidy Gott, for all your hard work to get this project completed – I appreciate you and am proud of everything you have achieved.

I appreciate the continuous support and encouragement from my family – thank you. I know you are all very proud of the work I have completed and I am excited to share it with you.

Table of Contents

Abstract.....	2
Acknowledgments.....	4
List of Tables	6
List of Figures.....	7
List of Abbreviations	8
Introduction.....	9
Literature Review.....	11
Methodology.....	13
Experiment Design.....	15
Study Locations	18
Statistical Analysis.....	20
Data.....	21
Summary Statistics.....	21
Results.....	24
Willingness to Pay	24
Price Premium Determinants	26
Consumer Perspectives	30
Conclusion	32
References.....	34
Appendix: Regression Results	38

List of Tables

Table 1: Demographic Characteristics of Cities Studied.....	19
Table 2: Number of Participants by Metropolitan Area and Farmers Market.....	21
Table 3: Age Summary Statistics for Participants	23
Table 4: T-test Results	25

List of Figures

Figure 1: Example of choice card presented to participants	16
Figure 2: Example of Sweet Grown Alabama Definition card presented to participants	17
Figure 3: Household Income Distribution	22
Figure 4: Participant Distribution by Age.....	23
Figure 5: Participant Distribution by Highest Education Level Attained.....	24
Figure 6: Average Willingness to Pay by Label, Metro Area.....	26
Figure 7: Average Price Premium by Metro Area	27
Figure 8: Average Price Premium by Age	28
Figure 9: Familiarity with Sweet Grown Alabama Label.....	30
Figure 10: Average Price Premium by Familiarity.....	31

List of Abbreviations

AL	Alabama
BDM	Becker-DeGroot-Marschak
HS	High School
SC	Some College
SGA	Sweet Grown Alabama
US	United States
WTP	Willingness to Pay

Introduction

Consumers tend to seek out local foods for multiple reasons including to support farmers and the local economy. As a result, consumers are typically willing to pay a higher price for local food compared to a similar product that is not local. Since the onset of COVID-19, interest in local food increased. The pandemic impacted the economy by causing supply chain disruptions which changed how people conventionally bought and sold food (Thilmany et al. 2021; Chenarides et al. 2021; Meixner and Katt 2020). Facing empty shelves at grocery stores during the pandemic, consumers started to seek local foods as an alternative to conventional grocery stores or wholesalers. Locally sourced foods are often perceived as healthier and safer, and the supply chains are less likely to experience transportation issues compared to conventional grocery store chains.

In this paper, we explore Alabama consumers' willingness to pay for differently labeled and sourced sweet potatoes using data collected from farmers market experiments conducted during the fall of 2022. We evaluate whether consumers are willing to pay a price premium for state-grown sweet potatoes versus a similar product from a farm outside of Alabama, and whether consumers would pay a price premium for sweet potatoes from an Alabama farm that carries the Sweet Grown Alabama logo. Alabama's state grown promotion program – Sweet Grown Alabama – was established in 2019. The goals of the program are to help consumers promote sustainability and the economy, enjoy local flavors, and support farmers by purchasing products that carry the Sweet Grown Alabama logo. However, due to the novelty of the program, there is no existing information available for farmers to understand whether consumers are willing to pay a price premium for products carrying the Sweet Grown Alabama logo. Because

there is a cost for farmers to become a Sweet Grown Alabama member and use its logo, this research can inform farmers whether it would be worth participating in the program.

Despite the sweet potato being Alabama's state vegetable, little research had been done to understand consumers' sweet potato purchasing habits. A variety of people who grow and sell sweet potatoes locally have the potential to benefit from this study. Specifically, farmers, farmers market managers, and state promotion program directors would have a better understanding of the changing consumer preferences and attitudes toward Alabama grown versus out-of-state sweet potatoes. This study will also add to the growing literature on consumer willingness to pay for local produce, both in Alabama and in other states.

Various willingness to pay studies investigating state promotion programs have been published evaluating products throughout the US (Meas et al. 2015; Naganie et al 2011; Onken et al. 2011). All these studies have similar findings which show that consumers pay a price premium for different labels such as "organic," "local," or belonging to a state promotion program. Overall, these studies showed consumers are willing to pay a premium for the products with the state promotion label compared to a similar product without a label. A study examining Alabama's state promotion program, Sweet Grown Alabama, has not been completed yet; however, there have been studies examining Alabama consumers attitudes towards purchasing local food at restaurants (Reynolds-Allie and Fields 2011) and local beef (Tackie et al. 2015a; Tackie et al. 2015b). However, these studies do not explore consumer willingness to pay for produce items. Thus, our study will add to the limited number of studies evaluating Alabama consumers' willingness to pay for local foods by focusing on a new product and setting.

For our analysis, we conduct an incentive-based experiment that uses the Becker-DeGroot-Marschak (henceforth referred to as BDM) mechanism to capture consumer valuation

for four differently labeled baskets of sweet potatoes at farmers markets across Alabama. A survey accompanied the experiment and included market and demographic questions. We use statistical methods to evaluate the willingness to pay for each basket to calculate the associated price premiums for state-grown and Sweet Grown Alabama sweet potatoes. Lastly, we examine factors that are associated with determining the magnitude of the premiums using simple linear regression.

We find that on average, respondents are willing to pay \$1.56 more for a basket of sweet potatoes from an Alabama farm compared to a similar product from a farm in the US that is not located in Alabama, on average. Furthermore, consumers are willing to pay an additional \$1.05 for a basket of sweet potatoes from an Alabama farm that participates in the Sweet Grown Alabama program compared to a basket of sweet potatoes from a farm in Alabama. This suggests that there is a sizable premium for local produce in Alabama and a brand premium for products carrying the relatively new Sweet Grown Alabama logo. Overall, our results provide insight to consumer preferences for local food and quantify a premium for Alabama's state-promotion program, Sweet Grown Alabama.

Literature Review

Although various work evaluating willingness to pay for local food has been conducted across the US (e.g. Burnett, Kuethe, Price 2011; Oken, Bernard and Pesek 2011; Nganje, Hugher and Lee 2011; Meas et al. 2015), there is little research on consumers' willingness to pay for local food in Alabama. Notable studies are Tackie et al. 2015a, Tackie et al. 2015b and Reynolds-Allie et al. 2011. This past research highlights the growing interest in purchasing differently marketed products based on different attributes such as how the products are sourced and perception of quality.

Studies examining consumer willingness to pay have been conducted in other countries. Boys et al. (2014) conducted a study in the Dominica to see consumer willingness to pay for organic and locally grown produce. This experiment found that Dominican consumers were willing to pay a premium for organic and local produce. Some of the factors holding consumers back from making this buying decision include lack of set organic standards and high perceived price premium. Set standard programs for organic and local produce would encourage consumers' confidence when buying organic and local foods. This in turn could encourage more farmers to adopt organic and local food selling practices.

Feldman et al. (2015) conducted a study investigating consumers' perceptions and preferences for local food by evaluating several studies from the United States and Europe. Using Alphabet Theory and Value-Belief-Norm Theory, the author has a better understanding of how attitudes are formed as well as how they change into purchase intentions and actual buying behavior. The author found that attitudes were a prevalent predictor of consumer purchase behavior. People tend to perceive local food as "tastier" or "higher quality." Other factors such as altruism, enjoyment of cooking, and high value of time with family were found to be valuable when marketing local foods.

There are many documented studies that have explored consumers' willingness to pay for local food in the southeast; however, there are none about sweet potatoes. Campbell et al. (2014) studied consumer perceptions of local food in university settings. They found that participants value locally sourced foods highly and encourages food service providers to emphasize this quality, as consumers perceived local foods to be of higher quality. This concept plays a major role in our research, as we try to distinguish why some consumers will be willing to pay more for produce from Alabama relative to a product from outside of the state.

There are few studies investigating consumer willingness to pay for sweet potatoes in the US, but notable exceptions include Nalley et al. (2004) and Nalley et al. (2006). Nalley et al. (2004) investigates how place of origin affects demand for sweet potatoes, finding that willingness to pay for sweet potatoes increased when location is known. Similar to this paper, Nalley et al. (2006) used an economic experiment and found that participants preferences changed when provided two pieces of additional information – taste experience and health information. After consumption and health information, participants were willing to pay a premium for sweet potatoes. This exposed a disconnect on the marketing side: people are unaware of the benefits of consuming sweet potatoes. This suggested that farmers would benefit from better marketing the benefits of the products to consumers.

Relatively little research has evaluated consumer preferences for local food in Alabama. For example, Tackie et al. (2015a) uses survey data and found that more than half (58%) of the participants were willing to pay a premium ranging from one to ten cents for meat that was labeled with attributes such as “local” or “regionally” produced. Tackie et al. (2015a) further discovers that two thirds of the participants perceive local or regionally labeled beef to be safer. These results show how impactful labeling food can be on how consumers perceive the product.

Methodology

An experiment and corresponding questionnaire were developed for this study. Experimental methods were used to measure consumer willingness to pay for differently labeled sweet potatoes. Sweet potatoes were chosen, because they play an important role in Alabama specialty-crop production. For example, the Alabama Sweet Potato Association is the only statewide commodity group for a specialty crop. According to the US Department of

Agriculture, Alabama produced 550 thousand hundredweights of sweet potatoes worth \$11.8 million, ranking sixth in the nation in sweet potato production (USDA-NASS, 2015).

The research team from Auburn University's College of Agriculture developed an experiment to investigate consumer willingness-to-pay for differently labeled and sourced sweet potatoes at farmers markets. The timeframe to complete this study was constrained by two factors: seasonality of sweet potatoes and open farmers markets in the fall. Due to the seasonality factor, we focused on conducting the survey during mid-September to early November. Sweet potatoes were obtained from two Alabama farms and from a farmers' market in Georgia that carried Mississippi sweet potatoes.

The experiment used an intercept method and the BDM mechanism for consumer valuation (Asioli, Mignani, and Alfnes 2020). BDM is an incentive-compatible valuation method commonly used in food consumer studies. Using this method, a participant places a bid for a product, then a market price for the same item is randomly generated. If the participant's bid price is higher than the random market price, the consumer purchases the product at the random market price. If the participant's bid price is lower than the randomly generated market price, the participant does not purchase the product. The participant is not bargaining over the price of the item with other buyers; however, the participant is encouraged to state their actual bid price in order to receive the most favorable outcome – bidding high to purchase the item or bidding low not to purchase the item. This method is commonly used to examine consumer behavior in grocery store and farmers market settings (Wasserman-Olin, Gómez, and Björkman 2023; Shi, House, and Gao 2013; Shi, House, and Gao 2012; Froehlich, Carlberg, and Ward 2009; Toler et al. 2009).

Experimental Design

The research team developed and pretested an experiment to use throughout the study. We closely follow methods developed by Bernard and Liu (2017), Bernard et al. (2018), and Duke et al. (2020). The script was specially designed to explain the experiment process and outcomes to participants. Only participants who were 19 or older were allowed to participate in the study. All the experiment materials and procedures were approved by the Auburn University Institutional Review Board (IRB Protocol #22-391 EX 2208).

For the experiment procedure, the participants were either self-selected or approached by a research team member. Using the pretested script, the researcher informed the participant that they would have the chance to receive sweet potatoes, money, or some combination of both by participating in the study. If the participant consented to voluntarily partake in the study, the research team member informed them about the experiment procedure and outcomes. The script used language to carefully explain why it was best for the participant to state their maximum willingness to pay. For example, before taking the final bids a research team member would inform the participant:

“Because you may end up buying sweet potatoes and you would pay the competing bidder’s bid should you outbid them, it is very important that you enter the actual maximum amount that you would be willing to pay. Entering too high of a value could lead you to buy one at more than it is worth to you while entering a lower value could mean missing a chance to buy a small basket of sweet potatoes at a lower price than your maximum willingness to pay. So please remember: if you outbid the competing bidder, you only will pay the price on the bingo ball—not your bid.”

The participant was presented with information on the origin and labeling of the four baskets of sweet potatoes. This information card was randomized so each participant was shown a different order of choices each time it was presented (See Figure 1 for an example of the information card). Each card contained information for the same four products: a basket of sweet

potatoes from a U.S. farm but not from Alabama with no label, a basket of sweet potatoes from a Mississippi farm with no label, a basket of sweet potatoes from an Alabama farm with no label, and a basket of sweet potatoes from an Alabama farm that participates in the Sweet Grown Alabama program with a Sweet Grown Alabama logo. The participant was then informed on what Sweet Grown Alabama was and what the labeling represented (Figure 2).


<p>Basket of sweet potatoes from a U.S. farm but not from Alabama</p> <p>NO LABEL</p>	<p>Basket of sweet potatoes from a Mississippi farm</p> <p>NO LABEL</p>	<p>Basket of sweet potatoes from an Alabama farm</p> <p>NO LABEL</p>	<p>Basket of sweet potatoes from Alabama farm participating in Sweet Grown Alabama program</p> 
<p>Please write here the most you would be willing to pay for this basket of sweet potatoes:</p>	<p>Please write here the most you would be willing to pay for this basket of sweet potatoes:</p>	<p>Please write here the most you would be willing to pay for this basket of sweet potatoes:</p>	<p>Please write here the most you would be willing to pay for this basket of sweet potatoes:</p>

Figure 1: Example of choice card presented to participants

After the participant was informed on the origin and labeling of the four types of sweet potato baskets and definition of Sweet Grown Alabama, they were asked to state their maximum willingness-to-pay for each basket of sweet potatoes. The maximum willingness-to-pay for each choice could be any dollar amount from zero dollars to twelve dollars, which was the amount they were given to bid for the experiment. Once the maximum willingness-to-pay was collected for each of the four choices, the participant rolled a four-sided die to determine which of the four

markets would be their binding bid.¹ A bingo ball cage was used to determine the competing bid, which represented the random market price. It contained bingo balls labeled in twenty-five cent increments from twenty-five cents to twelve dollars. If the participant's bid was equal to or higher than the random market price, the participant purchased the basket of five sweet potatoes at the competing bid price, or the price on the bingo ball. The participant also received the difference between the twelve dollars and the price of the competing bid. If the participant's bid were less than the random market price, they did not purchase the basket of five sweet potatoes but did receive a cash payment of twelve dollars for their participation.



Figure 2: Example of Sweet Grown Alabama Definition card presented to participants

Respondents completed a survey after finishing the experiment. The questionnaire had eight questions total: six market-based questions and two demographic questions. Lastly, participants were given the sweet potatoes and/or cash that they earned.

¹ Due to study budget constraints, participants were told that one of the four markets would be chosen at random for which their bids would be evaluated against a competing bidder.

Study Locations

The study was conducted at six farmers markets located in four metropolitan areas across Alabama: Auburn, Foley, Birmingham, and Huntsville. These metropolitan areas were chosen for several reasons. The first reason is that these four cities differ in populations and capture both urban and rural areas. Combined, the four cities account for about 10.28% of Alabama's total population (US Census Bureau, 2022). The chosen cities vary from one small city (Foley) accounting for less than one percent of the state's population, a college town (Auburn) that accounts for 1.57% of the population, and two large cities that account for 3.88% (Birmingham) and 4.37% (Huntsville) of the state's population. Another reason for selecting these cities is they differ in population demographics such as age, household income, education, and race (Table 1).

According to the US Census Bureau, each of the cities visited varied in age, income, education, and race compared to Alabama's total population. By conducting our study in these different cities throughout Alabama, we hoped to capture a more accurate reflection of the state's population. For example, median household income ranges from \$39,403 in Birmingham to \$60,959 in Huntsville. Significant differences in education level also exist across the four cities. Almost 60% of residents of Auburn have at least a bachelor's degree, compared to only 24% in Foley. Alabama is diverse racially, with 26.8% of the population being African American/ Black and 68.9% White. The chosen cities vary in the racial makeup, increasing the likelihood of obtaining a sample that well represents Alabama.

Table 1: Demographic Characteristics of Cities Studied

Age								
City	Persons under 5 years	Persons under 18	Persons between 18-65	Persons 65+				
Auburn	4.9%	19%	66.8%	9.3%				
Foley	2.1%	14.7%	52.5%	30.7%				
Birmingham	5.5%	19.4%	59.4%	15.7%				
Huntsville	5.8%	19.8%	58.2%	16.2%				
<u>Alabama Total</u>	<u>5.8%</u>	<u>22.3%</u>	<u>54.3%</u>	<u>17.6%</u>				
Income								
City	Median Household Income (in 2021 dollars)							
Auburn	\$54,700							
Foley	\$53,817							
Birmingham	\$39,403							
Huntsville	\$60,959							
<u>Alabama Total</u>	<u>\$54,943</u>							
Education								
City	High school graduate or higher, persons age 25 years+, 2017-2022		Bachelor's degree or higher, persons age 25 years+, 2017-2022					
Auburn	95.2%		59.4%					
Foley	87.6%		24.3%					
Birmingham	87.9%		28.8%					
Huntsville	91.1%		44.8%					
<u>Alabama Total</u>	<u>87.4%</u>		<u>26.7%</u>					
Race								
City	White alone	Black or African American alone	American Indian and Alaska Native alone	Asian alone	Native Hawaiian & Pacific Islander alone	Two or More Races	Hispanic or Latino	White alone, Hispanic or Latino
Auburn	70.2%	17.8%	0.1%	8.5%	0.0%	2.4%	3.4%	68.6%
Foley	83.4%	8.1%	0.0%	1.1%	0.0%	2.9%	8.7%	78.5%
Birmingham	25.1%	68.7%	0.2%	1.4%	0.0%	2.4%	4.4%	23.2%
Huntsville	59.9%	30.9%	0.4%	2.2%	0.1%	4.3%	6.4%	57%
<u>Alabama Total</u>	<u>68.9%</u>	<u>26.8%</u>	<u>0.7%</u>	<u>1.6%</u>	<u>0.1%</u>	<u>1.9%</u>	<u>4.8%</u>	<u>64.9%</u>

Data source: Population Estimates, July 1, 2022 (V2022) United States Census Bureau.

Statistical Analysis

We use pairwise t-tests to identify whether significant differences exist between willingness-to-pay for sweet potatoes across the four labels. Bonferroni correction is used to account for the multitude of tests across each of the four groups.

In particular, we were interested in two price premia: the price premium for a basket of sweet potatoes from a farm in Alabama versus sweet potatoes from a farm in the US but not in Alabama (called *AL premium*), and the price premium for sweet potatoes from an Alabama farm that participates in Sweet Grown Alabama program versus an Alabama farm (called *SGA premium*). We define the Alabama price premium as the average willingness to pay for the Alabama label minus the average willingness to pay for the US farm label. We define the Sweet Grown Alabama price premium as the average willingness to pay for the Sweet Grown Alabama label minus the average willingness to pay for the Alabama label.

Next, we use simple linear ordinary least squares regression to determine if consumer characteristics impacted the above price premia. The characteristics we explored include location of the farmers market, household income, age, education level, and prior familiarity to the Sweet Grown Alabama label. The equations estimated follow this format:

$$Premium_i = \beta X_j + \varepsilon,$$

where $Premium_i$ represents the price premium (either *AL Premium* or *SGA Premium*), and X_j represents the aforementioned characteristic explored, β is the coefficient of interest in each equation, and ε is the error term. For example, the equation to capture the effect of age on the premium for Sweet Grown Alabama would be estimated as follows,

$$SGA Premium = \beta \cdot Age + \varepsilon,$$

to generate β , the effect of respondent age on the Sweet Grown Alabama price premium. The p-value associated with the t-test statistic from the generated were used to determine whether the relationship is statistically significant.

Data

The total sample size was 122 with 121 usable responses. A distribution of the responses by metropolitan area and farmers market was included in Table 2 and Figure 3.

Table 2: Number of Participants by Metropolitan Area and Farmers Market

Metropolitan Area	Auburn	Foley	Birmingham		Huntsville	
Market	Ag Round Up	Coastal Alabama Farmers & Fishermens Market	Ross Bridge (Hoover)	Pepper Place	Madison County Market	MidCity Market
Participants	20	24	14	31	18	15

Summary Statistics

Below are some of the characteristics from our sampled population. These characteristics include income, age, and level of education. The plurality of participants were in the \$50,000 to \$74,000 income group, which is within the range of Alabama’s state median household income of \$54,943 (Figure 3). Collectively, most of the participants in the study had a household income of \$50,000 or more.

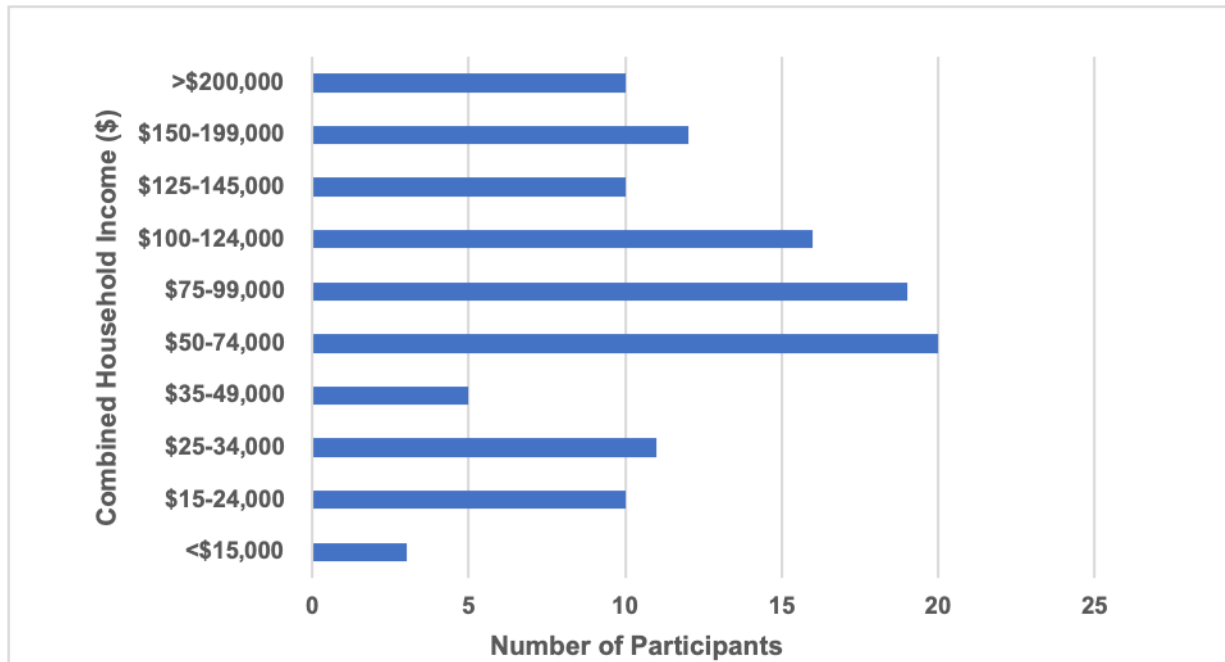


Figure 3: Household Income Distribution

The age category with the most participants was of 58–78-year-old age, which made up 28% of our sample (Figure 4). According to the 2022 United States Census Bureau this age group represents 17% of Alabama’s total population. The second most accounted for age group was 27–45-year-olds, which made up 27% of our sample. This age group makes up approximately 54% of Alabama’s total population. The average age sampled in the study was 44.96 years old ranging from 19 to 78 years old (Table 3). Overall, these results suggest that our sample tended to be older than the general Alabama population.

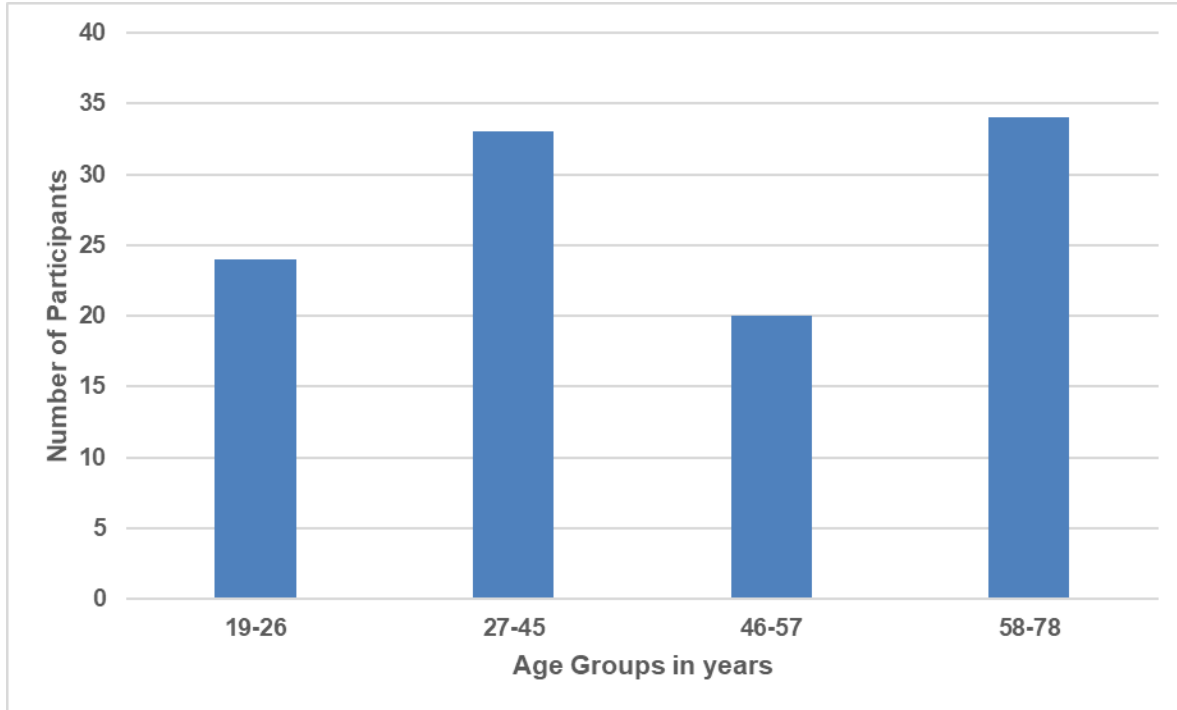


Figure 4: Participant Distribution by Age

Table 3: Age Summary Statistics for Participants

Mean	44.96
Median	46
Min	19
Max	78
Standard Deviation	16.94

The most common highest level of education in our sample was a bachelor’s degree (40%), while the second largest represented group of people sampled had a graduate degree (25%), as shown in Figure 5. According to the 2022 United States Census Bureau, approximately 27% of Alabama’s state population have a bachelor’s degree or higher, suggesting the sampled population had a much higher education level than the overall population of the state.

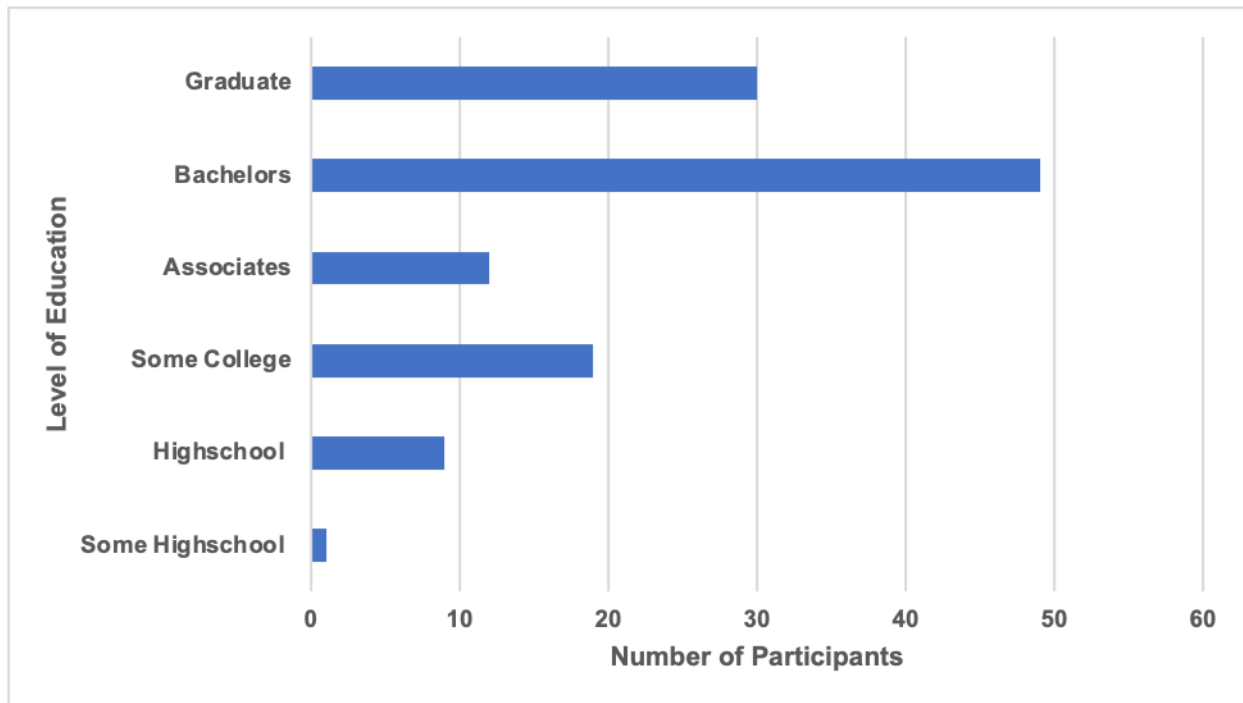


Figure 5: Participant Distribution by Highest Education Level Attained

Results

Responses from the incentive-based experiment were estimated to first determine whether price premia exist for Alabama-grown sweet potatoes and sweet potatoes from an Alabama farm that participates in the Sweet Grown Alabama program. Secondly, we evaluate factors that affect the magnitude of the price premia.

Willingness to Pay

Participants were asked their maximum willingness to pay for a basket of five sweet potatoes given each of the four different labels. As shown in table 4, we find that average willingness to pay ranged from \$4.16 to \$6.77 for the differently labeled baskets. Average willingness to pay was \$4.16 for a basket of sweet potatoes from a U.S. farm that is not in Alabama, \$4.78 for a basket of sweet potatoes from a Mississippi farm, \$5.72 for a basket of

sweet potatoes from an Alabama farm, and \$6.77 for a basket of sweet potatoes from an Alabama farm participating in the Sweet Grown Alabama program.

Table 4: T-Test Results for Willingness to Pay by Source

Category	Observations	Mean	p-values of two-sided t-tests			
			WTPUS	WTPMS	WTPAL	WTPSGA
US	117	4.18	-	<0.0001	<0.0001	<0.0001
Mississippi	117	4.85		-	<0.0001	<0.0001
Alabama	117	5.77			-	<0.0001
Sweet Grown Alabama	117	6.84				-

Our statistical analysis shows that willingness to pay is statistically different for sweet potatoes carrying each of the four labels. Using the pair wise t-tests, our results show that all the labels are statistically significant ($p < 0.0001$) for each pairwise test. The Bonferroni correction suggests that for six pairwise tests, the adjusted critical alpha level for a test with a 99% confidence level would equal 0.00167. Since our p values are all less than this critical alpha level, we conclude that willingness to pay for sweet potatoes carrying each of the four labels are significantly different from one another at a 99% confidence level.

Our results suggest that, on average, farmers market consumers are willing to pay a \$1.56 price premium for a basket of Alabama sweet potatoes relative to a similar product from a farm in the US but not in Alabama. Additionally, we observe that farmers market consumers are willing to pay \$1.05 more for a basket of Sweet Grown Alabama sweet potatoes relative to a similar product from Alabama without the Sweet Grown Alabama logo, on average.

A meta-regression analysis evaluating prior literature on willingness-to-pay for local food found that the price premium for local food averaged between \$1.696/lb. and \$2.076/lb. (Printezis et al., 2019). The results from this study support the findings of (Printezis et al., 2019), as a basket of sweet potatoes weighs around 1.5 lb., suggesting our measured premium was approximately \$1 per lb. for Alabama-grown sweet potatoes with an additional \$0.70 per lb. with the Sweet Grown Alabama logo. Interestingly, Printezis et al. (2019) found that consumers do not react to different labels – specifically, state grown labels – which differs from our result. This could be because Sweet Grown Alabama is a relatively new program, so participants in our study were excited to learn about it. Alternatively, the Sweet Grown Alabama logo was presented along with options that did not include a label so the presence of the label could have increased the willingness to pay.

Price Premium Determinants

Location

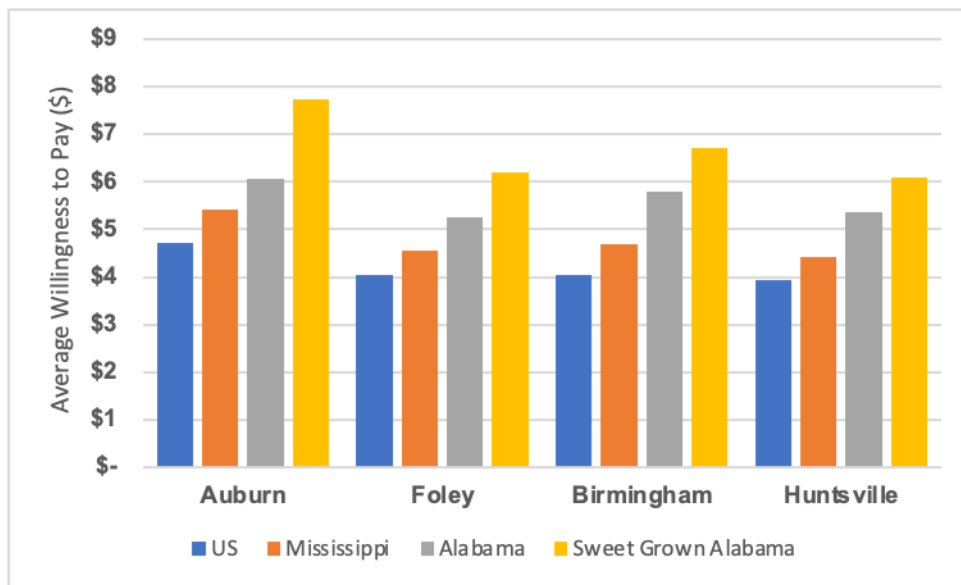


Figure 6: Average Willingness to Pay by Label, Metro Area

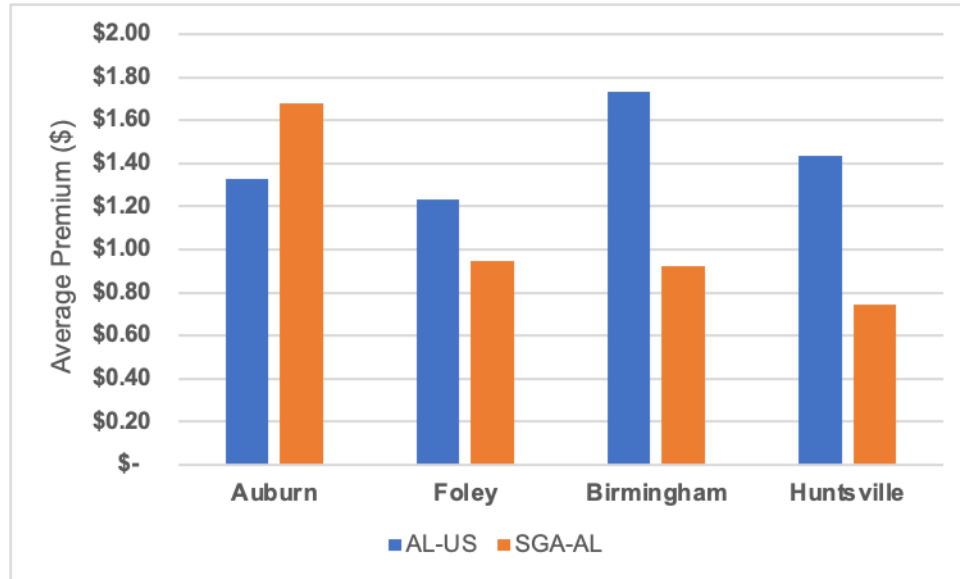


Figure 7: Average Price Premium by Metro Area

Note: Premiums compare the product labeled as from Alabama versus the product from a farm in the US but not from Alabama (AL-US) as well as the premium for Sweet Grown Alabama versus from a farm in Alabama (SGA-AL)

The participants at the Auburn location had the highest willingness to pay for each sourced basket of sweet potatoes. They were willing to pay on average \$1.33 more for a basket of Alabama sweet potatoes relative to a similar product from out of state. Additionally, they were willing to pay \$1.68 more for a basket of Sweet Grown Alabama sweet potatoes relative to a similar product from Alabama without the Sweet Grown Alabama label, on average. The Sweet Grown Alabama premium was statistically significantly higher for Auburn than each of the other three cities at a 90% confidence level (Appendix Table A1). However, the Sweet Grown Alabama premium was not statistically different between the three other metropolitan areas. Also, the Alabama premium did not differ statistically by location (Appendix Table A2).

Age

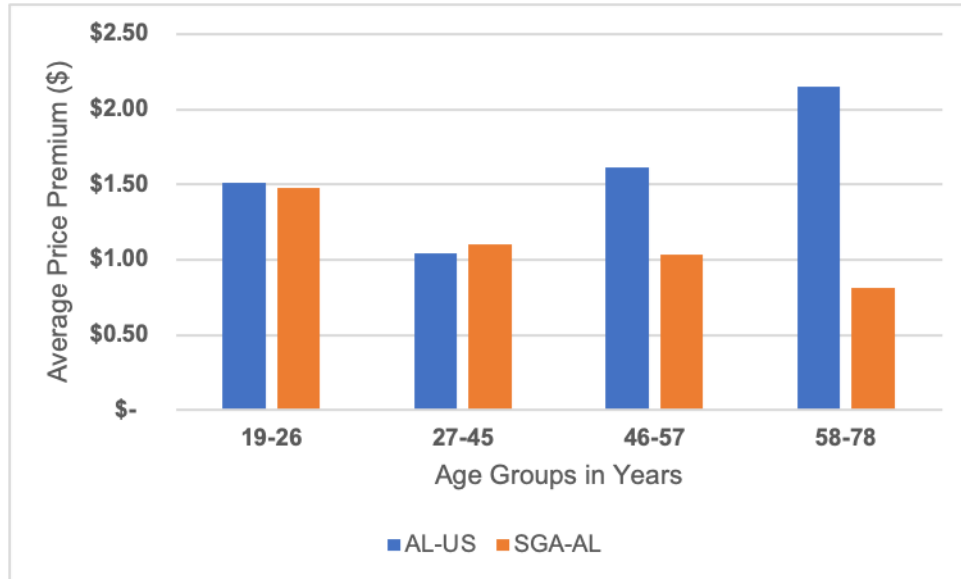


Figure 8: Average Price Premium by Age

Note: Premiums compare the product labeled as from Alabama versus the product from a farm in the US but not from Alabama, as well as the premium for Sweet Grown Alabama versus from a farm in Alabama

Each participant was asked various demographic questions, the first being the participant's age. The price premium for a basket of sweet potatoes from an Alabama farm compared to a basket from a US farm outside of Alabama ranged from \$0.81 to \$1.48 depending on the age group (Figure 8). The price premium for a basket from a farm participating in the Sweet Grown Alabama program relative to that from an Alabama farm without the Sweet Grown Alabama logo ranged from \$1.04 to \$2.15.

Simple linear regression was used to evaluate the effect of age on the two price premia. Age had a statistically significant effect on the Alabama premium for sweet potatoes, suggesting that the price premium for a basket of sweet potatoes from an Alabama farm over that from the US outside of Alabama increases by 2.5 cents for each year in age ($p=0.061$), as shown in Appendix Table A3. However, age did not have a statistically significant impact on the premium

for Sweet Grown Alabama sweet potatoes over those from an Alabama farm without the Sweet Grown Alabama logo (Appendix Table A4).

Education

The next demographic question investigated was the highest educational degree attained. These education categories range from having completed some high school to having a graduate degree. We find that education did have statistically significant impacts on the two price premia evaluated. In general, those with a higher education level were willing to pay a higher price premium for Sweet Grown Alabama sweet potatoes (Appendix Table A5). For example, participants with a graduate degree were willing to pay a \$1.22 higher premium than those with some high school ($p=0.099$). However, participants with a high school education had a higher premium for Sweet Grown Alabama than those with a graduate degree. The result is similar when analyzing the effect of education on the Alabama premium. Participants with a graduate degree had a statistically significantly higher premium for Alabama-grown sweet potatoes than both those with some college and those with an associates degree. (Appendix Table A6)

Household Income

The next demographic investigated was household income. The relationship between income and the Sweet Grown Alabama premium was unclear. Interestingly, respondents who had an annual household income of greater than \$200 thousand had a statistically significantly lower price premium for Sweet Grown Alabama sweet potatoes than those with a household income of less than \$15 thousand (Appendix Table A7). However, it is important to note that this

finding is likely driven by the low number of observations in the less than \$15,000 income group, which only has three observations. Other comparisons were not statistically significant.

Household income tended to positively correlate with the premium for Alabama-grown sweet potatoes. For example, participants with a household income greater than \$200 thousand had a significantly higher premium than both those who made \$15 thousand to \$24 thousand and those who made \$35 thousand to \$44 thousand (Appendix Table A8).

Consumer Perspectives

To explain the price premium, we asked participants to select what they believe is the primary reason why some consumers will be willing to pay more for the Sweet Grown Alabama produce from a farmers’ market, relative to product from unknown origin. These results show us that 50% of the participants believed that it was to “support local farmers,” 26% of the participants believed it was due to superior “product quality,” and 14% of the participants believed that it was to “support local economy.” The remainder of the characteristics included “health benefits,” “food safety,” “minimize environmental impact,” and “other.”

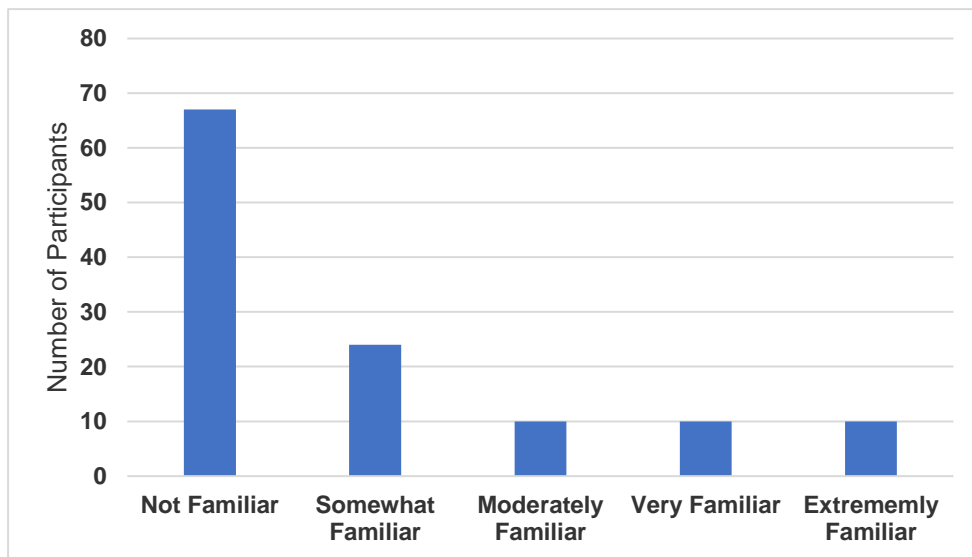


Figure 9: Familiarity with Sweet Grown Alabama Label

We find that 67% of participants are not at all familiar with the Sweet Grown Alabama brand. This is over double the number of participants who collectively are somewhat to extremely familiar with the Sweet Grown Alabama brand. Interestingly, the percentage of participants who are “not at all familiar” with the Sweet Grown Alabama brand were willing to pay on average \$6.65 for a basket of sweet potatoes from an Alabama farm that participates in the Sweet Grown Alabama program. These participants are still willing to pay a dollar premium for the Sweet Grown Alabama sweet potatoes compared to sweet potatoes from an Alabama farm that is not a Sweet Grown Alabama member, which is not statistically different from the premium placed by those who do have any level of familiarity with Sweet Grown Alabama (Figure 12 and Appendix Table A9).

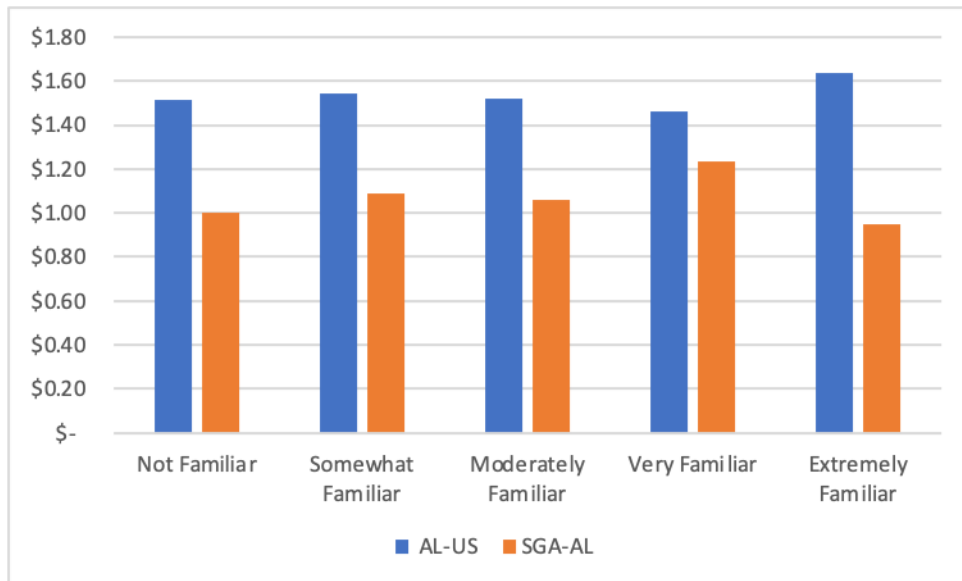


Figure 10: Average Price Premium by Familiarity

Note: Premiums compare the product labeled as from Alabama versus the product from a farm in the US but not from Alabama as well as the premium for Sweet Grown Alabama versus from a farm in Alabama

Conclusion

In summary, we capture consumer willingness to pay for differently labeled and sourced sweet potatoes at Alabama farmers markets. We use an incentive-based experiment with a corresponding questionnaire that included market and demographic questions. The experiment utilized the BDM mechanism to capture consumer valuation. We find that, on average, respondents are willing to pay \$1.56 more for a basket of sweet potatoes from an Alabama farm relative to a basket of sweet potatoes from a farm in the US but outside of Alabama, and \$1.05 more for a basket of sweet potatoes from an Alabama farm that participates in the Sweet Grown Alabama program compared to a basket of sweet potatoes from a farm in Alabama. We find that overall familiarity with Sweet Grown Alabama was low among participants, but this did not affect the premium of the brand, as familiarity with Sweet Grown Alabama did not have a significant effect on its price premium. Our results provide insight to consumer preferences for local food and quantify a premium for Alabama's state grown promotion program, Sweet Grown Alabama.

There are a few limitations of our study. First, we focus on only one product. Some potential participants may have chosen not to participate simply because they do not like sweet potatoes. If we were to have had a variety of products, we could have had more people participating in the study. Furthermore, willingness-to-pay and the associated price premium for Alabama-grown produce could be different for more commonly consumed products. Second, the experiment took place only at farmers markets. It is plausible that farmers market attendees place a higher value on local food compared to the general public, which would imply that our price premium results would be biased upwards in our sample.

Moving forward, there is room for future studies to examine different geographic locations, expand the types of produce evaluated, and explore alternative consumer settings. Other products that are commonly grown and consumed in Alabama that would be of interest include watermelons, strawberries, tomatoes, and sweet corn. In addition to farmers markets, alternative shopping settings include grocery stores, supermarkets, and restaurants. The present study was limited to just farmers markets in Alabama which comes with its own set of limitations. For example, people at farmers markets may feel more inclined to pay a premium for state branding programs since they are already seeking to purchase local products. This premium would vary greatly compared to consumers who do not seek out local produce and therefore may not be willing to pay more for state branding programs. Executing this study where most shopping takes place, such as at grocery stores or supermarkets, would provide a more accurate representation of consumers' willingness to pay.

References

- Asioli, Daniele, Adriana Mignani, and Frode Alfnes. "Quick and easy? Respondent evaluations of the Becker–DeGroot–Marschak and multiple price list valuation mechanisms." *Agribusiness* 37.2 (2021): 215-234.
- Berg, Nathan, and Kate L. Preston. "Willingness to pay for local food?: Consumer preferences and shopping behavior at Otago Farmers Market." *Transportation Research Part A: Policy and Practice* 103 (2017): 343-361.
- Bernard, John C., Joshua M. Duke, and Sara E. Albrecht. "Do labels that convey minimal, redundant, or no information affect consumer perceptions and willingness to pay?." *Food Quality and Preference* 71 (2019): 149-157.
- Bernard, John C., and Yinan Liu. "Are beliefs stronger than taste? A field experiment on organic and local apples." *Food Quality and Preference* 61 (2017): 55-62.
- Boys, Kathryn A., David B. Willis, and Carlos E. Carpio. "Consumer willingness to pay for organic and locally grown produce on Dominica: Insights into the potential for an "Organic Island"." *Environment, development and sustainability* 16 (2014): 595-617.
- Burnett, Perry, Todd H. Kuethe, and Curtis Price. "Consumer preference for locally grown produce: An analysis of willingness-to-pay and geographic scale." *Journal of Agriculture, Food Systems, and Community Development* 2.1 (2011): 269-278.
- Campbell, Jeffrey, Robin B. DiPietro, and Daniel Remar. "Local foods in a university setting: Price consciousness, product involvement, price/quality inference and consumer's willingness-to-pay." *International Journal of Hospitality Management* 42 (2014): 39-49.
- Canavari, Maurizio, et al. "How to run an experimental auction: A review of recent advances." *European Review of Agricultural Economics* 46.5 (2019): 862-922.

- Chenarides, Lauren, et al. "Food consumption behavior during the COVID-19 pandemic." *Agribusiness* 37.1 (2021): 44-81.
- Duke, Joshua M., John C. Bernard, and Gregory Vitz. "A new food label to aid farmland preservation programs: Evidence from a field experiment." *Food Policy* 99 (2021): 102011.
- Feldmann, Corinna, and Ulrich Hamm. "Consumers' perceptions and preferences for local food: A review." *Food quality and preference* 40 (2015): 152-164.
- Froehlich, E. J., Carlberg, J. G., & Ward, C. E. (2009). Willingness-to-pay for fresh brand name beef. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, 57(1), 119-137.
- Meas, Thong, et al. "Substitutes or complements? Consumer preference for local and organic food attributes." *American Journal of Agricultural Economics* 97.4 (2015): 1044-1071.
- Meixner, Oliver, and Felix Katt. "Assessing the impact of COVID-19 on consumer food safety perceptions—A choice-based willingness to pay study." *Sustainability* 12.18 (2020): 7270.
- Naanwaab, Cephas, et al. "Evaluation of consumers' perception and willingness to pay for bacteriophage treated fresh produce." *Bacteriophage* 4.4 (2014): e979662.
- Nalley, Lawton Lanier, Darren Hudson, and Gregory M. Parkhurst. "Consistency of consumer valuation under different information sets: An experimental auction with sweet potatoes." *Journal of Food Distribution Research* 37.856-2016-56239 (2006): 56-67.
- Nalley, Lawton Lanier, Darren Hudson, and Gregory M. Parkhurst. *The impacts of taste, location of origin, and health information on market demand for sweet potatoes*. No. 1110-2016-91780. 2004

- Nganje, William E., Renée Shaw Hughner, and Nicholas E. Lee. "State-branded programs and consumer preference for locally grown produce." *Agricultural and Resource Economics Review* 40.1 (2011): 20-32.
- Onken, Kathryn A., John C. Bernard, and John D. Pesek. "Comparing willingness to pay for organic, natural, locally grown, and state marketing program promoted foods in the mid-Atlantic region." *Agricultural and Resource Economics Review* 40.1 (2011): 33-47.
- Printezis, Iryna, Carola Grebitus, and Stefan Hirsch. "The price is right!? A meta-regression analysis on willingness to pay for local food." *PloS one* 14.5 (2019): e0215847.
- Reynolds-Allie, Kenesha, and Deacue Fields. *Alabama restaurant preferences and willingness to pay for local food: A choice based approach*. No. 1371-2016-108892. 2011.
- Shi, L., House, L., & Gao, Z. (2012). *Consumers' willingness-to-pay for organic and local blueberries: A multi-store BDM auction controlling for purchase intentions* (No. 323-2016-11421).
- Shi, L., House, L. A., & Gao, Z. (2013). Impact of purchase intentions on full and partial bids in BDM auctions: Willingness-to-pay for organic and local blueberries. *Journal of Agricultural Economics*, 64(3), 707-718.
- Tackie, Nii O., Jannette R. Bartlett, and Akua Adu-Gyamfi. "Assessing Alabama consumer attitudes and beliefs about locally or regionally produced livestock and products." *Professional Agricultural Workers Journal* 2.2 (2015)a: 8.
- Tackie, Nii O., et al. "The impact of socioeconomic factors and meat attributes on willingness to pay for locally or regionally produced livestock products in Alabama." *Journal of Economics and Sustainable Development* 6.12 (2015)b: 140-153.

- Thilmany, Dawn, et al. "Local food supply chain dynamics and resilience during COVID-19." *Applied Economic Perspectives and Policy* 43.1 (2021): 86-104.
- Toler, S., Briggeman, B. C., Lusk, J. L., & Adams, D. C. (2009). Fairness, farmers markets, and local production. *American Journal of Agricultural Economics*, 91(5), 1272-1278.
- USDA National Agricultural Statistics Service. Data Item: Sweet Potatoes – Production, Measured in CWT (2017). NASS - Quick Stats. <https://data.nal.usda.gov/dataset/nass-quick-stats>. Accessed 2023-07-20.
- U.S. Census Bureau. *Quickfacts: Alabama*, www.census.gov/quickfacts/fact/table/AL/PST045222. Accessed 20 July 2023.
- Wasserman-Olin, R., Gómez, M. I., & Björkman, T. (2023). Meeting the Expectations of the Customer: Consumer Valuation of Broccoli Produced in the Eastern United States and the Impact of Local Marketing. *Sustainability*, 15(10), 7878.
- Wolf, Christopher A., Glynn T. Tonsor, and Nicole J. Olynk. "Understanding US consumer demand for milk production attributes." *Journal of Agricultural and Resource Economics* (2011): 326-342.
- Wong, Jonathan, et al. *Grass-Fed versus Organic Dairy Production: Southeastern US Willingness to Pay*. No. 382-2016-22522. 2008.

Appendix: Regression Results

Table A1: Regression Results for Effects of Location on SGA Premium

Note: Auburn omitted because of collinearity						
Source	SS	df	MS			
Model	9.637	3	3.212		Number of obs = 117	
					F(9, 105) = 1.74	
Residual	208.994	113	1.850		Prob > F = 0.164	
					R-Squared = 0.044	
Total	218.631	116	1.885		Adj R-squared = 0.019	
					Root MSE = 1.36	
	Coef.	St. Err.	t	P> t 	[95% Conf. Interval]	
Birmingham	-0.646	0.367	-1.76	0.081	-1.373	0.080
Huntsville	-0.859	0.395	-2.17	0.032	-1.642	-0.0757
Baldwin	-0.730	0.412	-1.77	0.079	-1.545	0.086
_cons	1.68	0.304	5.52	0.000	1.075	2.280

Table A2: Regression Results for Effects of Location on AL Premium

Source	SS	df	MS			
Model	10.3491	3	3.450		Number of obs = 117	
					F(9, 105) = 0.87	
Residual	445.632	113	3.944		Prob > F = 0.457	
					R-Squared = 0.023	
Total	455.981	116	3.931		Adj R-squared = -0.003	
					Root MSE = 1.986	
	Coef.	St. Err.	t	P> t 	[95% Conf. Interval]	
Birmingham	0.623	0.536	1.16	0.247	-0.438	1.684
Huntsville	0.184	0.577	0.32	0.751	-0.960	1.327
Baldwin	-0.095	0.601	-0.16	0.874	-1.287	1.095
_cons	1.325	0.444	2.98	0.003	0.445	2.205

Table A3: Regression Results for Effects of Age on AL Premium

Source	SS	df	MS			
Model	13.777	1	13.777		Number of obs = 117	
					F(9, 105) = 3.58	
Residual	442.204	115	3.845		Prob > F = 0.061	
					R-Squared = 0.0302	
Total	455.981	116	3.931		Adj R-squared = 0.022	
					Root MSE = 1.961	
	Coef.	St. Err.	t	P> t	[95% Conf. Interval]	
Age	.0254	.0134	1.89	0.061	-0.0012	0.052
_cons	1.036	.342	3.03	0.003	0.359	1.74

Table A4: Regression Results for Effects of Age on SGA Premium

Source	SS	df	MS			
Model	3.0546	1	3.055		Number of obs = 117	
					F(9, 105) = 1.63	
Residual	215.576	115	1.875		Prob > F = 0.204	
					R-Squared = 0.014	
Total	218.631	116	1.885		Adj R-squared = 0.005	
					Root MSE = 1.369	
	Coef.	St. Err.	t	P> t	[95% Conf. Interval]	
Age	-0.0120	0.009	-1.28	0.204	-0.0305	0.007
_cons	1.330	0.239	5.57	0.000	0.857	1.803

Table A5: Regression Results for Effects of Education on SGA Premium

Source	SS	df	MS			
Model	16.994	5	3.399		Number of obs = 117	
					F(9, 105) = 1.87	
Residual	201.637	111	1.817		Prob > F = 0.105	
					R-Squared = 0.078	
Total	218.631	116	1.885		Adj R-squared = 0.036	
					Root MSE = 1.348	
	Coef.	St. Err.	t	P> t	[95% Conf. Interval]	
Some HS	-2.275	1.369	-1.66	0.099	-4.989	0.438
HS	1.225	0.534	2.29	0.024	0.165	2.283
Some College	-0.052	0.393	-0.13	0.895	-0.830	0.726
Associates	-0.025	0.458	-0.06	0.956	-0.934	0.883
Bachelors	-0.0174	0.313	-0.06	0.956	-0.638	0.603
_cons	1.025	0.242	4.24	0.000	0.546	1.505

Table A6: Regression Results for Effects of Education on AL Premium

Source	SS	df	MS			
Model	40.051	5	8.010		Number of obs = 117	
					F(9, 105) = 2.14	
Residual	415.930	111	3.747		Prob > F = 0.066	
					R-Squared = 0.088	
Total	455.981	116	3.931		Adj R-squared = 0.047	
					Root MSE = 1.936	
	Coef.	St. Err.	t	P> t	[95% Conf. Interval]	
Some HS	0.0742	1.967	0.04	0.970	-3.823	3.971
HS	-0.176	0.768	-0.23	0.819	-1.697	1.345
Some College	-1.242	0.564	-2.20	0.030	-2.359	-0.124
Associates	-1.842	0.658	-2.80	0.006	-3.147	-0.538
Bachelors	-0.480	0.450	-1.07	0.288	-1.371	0.411
_cons	2.176	0.3477	6.26	0.000	1.487	2.865

Table A7: Regression Results for Effects on Household Income on SGA Premium

Source	SS	df	MS			
Model	39.977	9	4.442		Number of obs = 115	
					F(9, 105) = 2.63	
Residual	177.487	105	1.690		Prob > F = 0.009	
					R-Squared = 0.184	
Total	217.466	114	1.908		Adj R-squared = 0.114	
					Root MSE = 1.300	
	Coef.	St. Err.	t	P> t	[95% Conf. Interval]	
<\$15,000	3.073	0.856	3.59	0.001	1.376	4.77
\$15-24,000	0.873	0.581	1.50	0.136	-0.280	2.026
\$25-34,000	0.392	0.568	0.69	0.493	-0.735	1.518
\$35-49,000	0.473	0.712	0.66	0.508	-0.939	1.885
\$50-74,000	0.049	0.500	0.10	0.922	-0.941	1.040
\$75-99,000	0.073	0.508	0.14	0.886	-0.934	1.080
\$100-124,000	-0.311	0.524	-0.59	0.554	-1.351	0.728
\$125-149,000	.0774	0.597	0.13	0.897	-1.107	1.262
\$150-199,000	-0.450	0.568	-0.79	0.430	-1.576	0.677
_cons	0.927	0.411	2.25	0.026	0.112	1.742

Table A8: Regression Results for Effects on Household Income on AL Premium

Source	SS	df	MS			
Model	82.148	9	9.128		Number of obs = 115	
					F(9, 105) = 2.57	
Residual	372.289	105	3.546		Prob > F = 0.010	
					R-Squared = 0.181	
Total	454.437	114	3.986		Adj R-squared = 0.111	
					Root MSE = 1.883	
	Coef.	St. Err.	t	P> t 	[95% Conf. Interval]	
<\$15,000	-3.067	1.240	-2.47	0.015	-5.524	-0.609
\$15-24,000	-2.575	.842	-3.06	0.003	-4.245	-0.905
\$25-34,000	-1.65	.823	-2.01	0.047	-3.281	-0.019
\$35-49,000	0.2	1.031	0.19	0.847	-1.845	2.245
\$50-74,000	-.329	.723	-0.45	0.651	-1.763	1.106
\$75-99,000	-1.124	.736	-1.53	0.130	-2.582	.335
\$100-124,000	-.228	.759	-0.30	0.764	-1.733	1.277
\$125-149,000	-.628	.865	-0.73	0.470	-2.343	1.088
\$150-199,000	-.2182	.823	-0.27	0.791	-1.850	1.413
_cons	2.4	.595	4.03	0.000	1.219	3.581

Table A9: Regression Results for Effects of Prior Familiarity on SGA Premium

Source	SS	df	MS			
Model	2.801	4	0.700		Number of obs = 117	
					F(9, 105) = 0.36	
Residual	215.830	112	1.927		Prob > F = 0.834	
					R-Squared = 0.012	
Total	218.631	116	1.885		Adj R-squared = -0.022	
					Root MSE = 1.388	
	Coef.	St. Err.	t	P> t	[95% Conf. Interval]	
Somewhat familiar	-0.147	0.335	-0.43	0.664	-0.814	0.521
Moderately Familiar	-0.082	0.472	-0.17	0.862	-1.016	0.852
Very Familiar	0.448	0.472	0.95	0.344	-.486	1.382
Extremely Familiar	-0.165	0.493	-0.34	0.738	-1.144	0.813
_cons	1.082	0.172	6.28	0.000	0.741	1.423