

# **THE IMPACT OF SOCIOECONOMIC FACTORS AND MEAT ATTRIBUTES ON WILLINGNESS TO PAY FOR LOCALLY OR REGIONALLY PRODUCED LIVESTOCK PRODUCTS IN FLORIDA, US**

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## **Abstract**

*The study examined the impact of socioeconomic factors and meat attributes on willingness to pay for locally or regionally produced livestock products. Data were obtained from a convenience sample of participants from several Florida counties, and were analyzed using descriptive statistics and ordinal logistic analysis. The socioeconomic factors comprised more females than males, more Whites than Blacks, more middle-aged or older persons than younger*

persons, with relatively high educational levels, with moderate household incomes, and more married persons than singles. A majority of respondents were willing to pay more for meat certified as locally or regionally produced. Furthermore, a majority agreed or strongly agreed with statements on meat attributes, except for the “no difference in safety” and “hygiene” attributes. The ordinal logistic results revealed that race/ethnicity, education, safety (safe to consume), no difference in safety, availability, and hygiene had significant effects on the willingness to pay more for meat certified as locally or regionally produced. Consequently, socioeconomic factors and meat attributes matter in the consumption of locally or regionally produced livestock products, and should be taken into consideration in production and marketing of such products.

*Keywords: Socioeconomic Factors, Meat Attributes, Local or Regional, Willingness to Pay, Livestock Products*

## INTRODUCTION

Sustainable and safe food is a major issue of interest to consumers. This is reflected in U.S. agricultural sales trends. For example, the USDA National Agricultural Statistics Service [NASS] (2016) reported that more than 160,000 farms used direct and intermediated sales, and that the local foods market was about \$12bn in 2014. Relatedly, Low et al. (2015) reported that in 2012, counties that had at least 100 farmers using direct marketing channels were concentrated in the Northeast, Mid-Atlantic States, and on the West Coast. Furthermore, most local food hubs were found in metropolitan counties; 56% in the Northeast and Mid-Atlantic States and 23% on the West Coast.

Gwin, Thiboumery, & Stillman (2013) emphasized that the term “local” or “regional” food generally means production and marketing that occur within a specific geographic area relative to the producer and consumer, or specific social or supply chain characteristics in producing foods. Martinez et al. (2010) explained that the resurgence in marketing and consumption of locally produced foods is based in part on the foods’ perceived freshness and health benefits; consumers’ familiarity with their sources; promotion of environmental sustainability, and support for small farms and local economies.

What is more, Battie & Ernst (2006) explained that many consumers link local foods with the concept of “sustainability”, because they use less energy, support regional economies, and are less dependent on trade. In addition, not only does locally grown produce draw consumers to direct markets (e.g., farmers markets) each summer, but has also caught the attention of

several grocery stores. These stores promote such foods as “locally grown”, suggesting that the stores have examined the market for local foods and determined that local foods are worth marketing to consumers. There seem to be ample evidence that some, if not many, consumers are willing to pay premium prices for locally produced foods. Burt, Goldblatt, & Silverman (2015) examined the attributes of local foods that are of importance to consumers. They reported that the most important attributes are fresh; followed by quality, sustainable, healthy, organic, antibiotic-free, and genetically modified-free.

Apart from the increase in demand for local foods in general, there is also increase in locally produced meats in particular. For instance, Liu, Nelson, & Styles (2013) stated that the increasing demand for locally raised beef and poultry shows consumers’ preference for healthy meats. In fact, the attributes related to meat safety have become critical elements in motivating consumers to make food selection. Also, Henschion et al. (2014) stressed that one of the reasons for the substitution of red meat for white meat in many developed markets is health and dietary awareness, which impinges on quality.

Olsson & Brandt (2015) argued that food quality in simple terms can be understood as a product’s ability to meet the expectations of the consumer. However, quality can also be understood as “properties” or “inherent value.” Guenther, Jensen, Batres-Marquez, & Chen (2005) stressed that consumers’ attitudes and beliefs about meat products depend on the product and characteristics of the individual. Moreover, knowledge and attitudes about meat products may influence choices regarding the consumption of specific types of meat. Similarly, socioeconomic factors and meat attributes may also influence willingness to pay for livestock products.

Banterleb & Stranieri (2015) stated that locally or regionally produced meat products have become very popular due partially to the increased separation between food producers and consumers in the U.S. There is limited research on factors that affect consumers’ willingness to pay for locally or regionally produced livestock products, especially in the Southeastern U.S. Understanding which socioeconomic factors and which meat attributes affect consumers’ willingness to pay is important. Consequently, there is the need to undertake research to ascertain the status of such locally or regionally produced foods. This notwithstanding, Tackie, Bartlett, & Adu-Gyamfi (2015) conducted a research on the impact of socioeconomic factors and meat attributes on willingness to pay for locally or regionally produced livestock products in Alabama. This study focuses on the State of Florida as it is also part of the Southeastern U.S., and it is patterned after the Tackie et al. (2015) study.

The purpose of the study, therefore, was to assess the impact of socioeconomic factors and meat attributes on willingness to pay for locally or regionally produced livestock products in

Florida. Specific objectives were to (1) identify and describe socioeconomic factors, (2) describe and assess meat attributes, and (3) estimate the extent to which socioeconomic factors and meat attributes affect the willingness to pay more for locally or regionally produced meat products.

## LITERATURE REVIEW

### **Socioeconomic Factors and Willingness to Pay**

Several studies have reported on socioeconomic factors and their relationships to willingness to pay. These factors include gender, age, household income, education, household size, and household type. For example, Carpio & Isengildina (2008) assessed consumer willingness to pay for organic and locally grown products in South Carolina. They reported that age, gender, income, and willingness to support the local economy had significant effects on consumers' willingness to pay more for locally produced products. Older, higher income, and female consumers were willing to pay more for local products compared to younger, lower income, and male consumers. Consumers who purchased local products to support local economy were willing to pay premiums of 4 and 3%, respectively, for locally grown produce and locally produced animal products. Also, consumers were willing to pay average premiums of 27 and 23%, respectively, for locally grown produce and locally produced animal products.

Emukule, Nigigi, & Guliye (2011) analyzed socioeconomic factors influencing willingness to pay for camel milk in Nakuru District, Kenya. The results showed that willingness to pay was significantly affected by consumers' awareness of camel milk. The willingness to pay more for camel milk among potential consumers who were aware of camel milk was three times more than those who were not aware of the product. Other factors such as employment status, household income, age, education, and household size did not have significant effects on willingness to pay.

Boys, Willis, & Carpio (2014) assessed consumer willingness to pay for organic and locally grown produce on Dominica. They found that age, household income, marital status, and having at least one household member with a nutritional health problem, positively and significantly affected willingness to pay for organic locally grown produce. Older consumers were more willing to pay more for organic and locally grown produce than younger consumers. Higher income consumers were willing to pay more for organic and locally grown produce than lower income consumers. Also, single persons were willing to pay more for organic or locally grown produce than those who were married with children. Consumers who had at least one household member with a nutritional health problem were willing to pay more for organic and locally grown produce than those who did not have such a household member.

Campiche, Holcomb, & Ward (2014) examined the impact of consumer characteristics and perceptions on willingness to pay for natural beef in the U.S. Southern Plains. The authors found that household income significantly affected willingness to pay more for natural beef. Respondents with annual household incomes of more than \$100,000 were two times more likely to purchase natural beef than those with annual household incomes of \$40,000-69,000.

Shashikiran & Madhavaiah (2015) assessed the impact of socioeconomic factors on the purchase behavior of organic food products. They reported that age, gender, marital status, education, and income significantly affected consumer purchasing behavior. Younger respondents (age group of 20-30 years) and female respondents were more willing to purchase organic food products than any other group. Also, married persons were more willing to purchase organic products than singles; college graduates were more willing to purchase organic products than those with less than college education, and consumers with higher incomes were more willing to purchase organic products than those with lower incomes.

Tackie et al. (2015) evaluated the influence of socioeconomic factors and meat attributes on willingness to pay for locally or regionally produced livestock products in Alabama. They reported that household size had a significant impact on consumers' willingness to pay more for beef or goat meat certified as locally or regionally produced. Consumers who had smaller household sizes were willing to pay more for beef or goat meat certified as locally or regionally produced than those with larger household sizes.

Dobbs et al. (2016) studied Tennessee consumers' willingness to pay for beef produced in Tennessee. They reported that age and household size significantly affected the willingness to pay more for locally produced beef. Older consumers were less willing to pay more for locally produced beef than younger consumers. Consumers with larger household sizes were less willing to pay more for locally produced beef than those with smaller household sizes.

### **Meat Attributes and Willingness to Pay**

Also, a number of studies have reported on meat attributes and willingness to pay. Some of these attributes are price, artificial ingredients, labeling, safety, traceability, and place of origin. For instance, Corsi (2002) assessed consumers' willingness to pay a price for organic beef. The author reported results for two different groups of consumers, consumers who knew the price of regular beef, Group 1, and those did not know its price, Group 2. Among the first group, the average willingness to pay for organic roast beef was \$23/kg. Among the second group, the average willingness to pay for organic roast beef was nearly \$26/kg. The overall mean of willingness to pay for organic roast beef was nearly \$25/kg. The average willingness to pay for organic minute steak for the first group was \$26/kg; the average willingness to pay for organic

minute steak for the second group was \$25/kg. The overall mean willingness to pay for organic minute steak was also about \$25/kg. On average, the price that consumers were willing to pay for organic roast beef was \$10/kg higher than the price currently paid for regular beef.

Umberger, Feuz, Calkins, & Sitz (2003) studied consumer perceptions on country-of-origin labeling of beef products. They found that the majority of the consumers, 75%, indicated that they preferred to purchase labeled beef products; 73% were willing to pay a premium for country-of-origin labeling for steak and hamburger. Consumers, on average, were willing to pay a \$0.42/lb. or an 11% premium for country-of-origin labeled steak, and \$0.36/lb. or a 24% premium for country-of-origin labeled hamburger. Also, after visually evaluating the steaks, 69% were willing to pay a premium for the steak labeled as "USA Guaranteed." Consumers preferred country-of-origin labeling because of the following reasons: food safety concerns; preferences for labeling source and origin information; a strong desire to support US producers, and the belief that US beef was of higher quality compared to other beef.

Fadiga (2010) assessed consumer valuations of the quality and safety attributes of milk and meat in Kenya. The author found that 75% of the respondents believed that the meat they consumed was safe; 63% expressed their willingness to pay more for improved quality and safety of meat, and 67% were willing to pay more for improved quality and safety of the milk. Of the attributes affecting willingness to pay for milk, price was the most important (41%); followed by smell (31%), hygiene (15%), and color (12%). However, the most important attributes for willingness to pay more for meat was more balanced; price (25%), hygiene (20%), and labeling (25%).

Neme (2011) evaluated consumer preference and willingness to pay for sheep meat quality and safety in Addis Ababa. The author reported that meat attributes, namely, hygiene, quality, safety, and price affected consumers' willingness to pay for sheep. Consumers had a particular preference for hygiene as the most dominant attribute influencing their purchasing decision. Most of the respondents were willing to pay a premium of \$1.05 per lb. for hygiene of sheep meat. Furthermore, the results revealed that 58% were not willing to pay for sheep meat because it was not affordable; 7% could not purchase sheep meat because of its non-availability at near point of sale.

Van Loo, Caputo, Nayga, Meullenet, & Ricke (2011) examined consumers' willingness to pay for organic chicken breast. They reported that consumers were willing to pay a 34% premium for general organic labeled chicken, and a 104% premium for the USDA organic labeled chicken. The willingness to pay also differed between different types of consumers. Non-buyers were willing to pay a 29% premium for general organic labeled chicken, and a 26% premium for USDA organic labeled chicken. The occasional buyers were willing to pay a 35%

premium for general organic labeled chicken, and a 97% premium for USDA organic labeled chicken. The habitual buyers were willing to pay a 146% premium for general labeled chicken and 244% premium for USDA certified organic labeled chicken. Overall, USDA organic certification was valued more than the general organic label; consumers trusted the USDA organic labeled products more than the general organic labeled products.

Cicia & Colantuon (2012) analyzed willingness to pay for traceable meat attributes. They found that variables like food safety, place of origin, on-farm traceability, unprocessed meat, and base price affected willingness to pay for meat products. For food safety, most of consumers were willing to pay between 12 and 16% over the base price for meat products. The authors also reported that consumers assigned a premium of between 11 and 16% over the base price in order to be fully informed about the “meat’s path” from the farm to the table. The base price influenced significantly the premium that consumers were willing to pay; a higher base price significantly and positively affected the willingness to pay more for meat products.

Berges, Casellas, Rodriguez, & Errea (2015) examined willingness to pay for quality attributes of fresh beef. They found that 34% of the respondents were willing to pay more for safety of branded beef, whereas 18% were willing to pay more for quality labeled beef. Overall, consumers were willing to pay a premium of \$4.48 for a certification at the place of purchase. Also, consumers were willing to pay 16% above the base price of \$28/kg of strip loin for hygienic certification.

Dobbs (2015) evaluated consumers’ willingness to pay for beef produced in Tennessee. Three categories of consumers displayed different responses towards steak and ground beef; those who were price conscious were less willing to pay more for steak; those who valued flavorful beef products were willing to pay more for steak, and those who valued freshness, safety, and natural production were willing to pay more for ground beef. Label, color, juiciness, freshness, lean, and humane treatment of animals did not have any significant effects on willingness to pay more for steak. Relatedly, label, price, color, flavor, juiciness, tenderness did not have any significant effects on willingness to pay more for ground beef.

Tackie et al. (2015) assessed the impact of socioeconomic factors and meat attributes on willingness to pay for locally or regionally produced livestock products in Alabama. They found that safety (safe to consume), no difference in safety between locally and non-locally produced meat, and hygiene significantly affected consumers’ willingness to pay more for meat certified as locally or regionally produced. Safety had a positive relationship with willingness to pay more, and no difference in safety and hygiene had negative relationships with willingness to pay more.

## METHODOLOGY

A questionnaire was developed, including questions adopted with permission, from Govindasamy, Italia, & Rabin (1998). There were two major sections, namely, attitudes and beliefs, and demographic information. The questionnaire was submitted to the Institutional Review Board of the Institution for approval before being administered.

The questionnaire was administered by means of convenience sampling. The reason was that there was not an available sampling frame from which subjects could be drawn, and therefore, it was the most appropriate approach taking into consideration time and other resources.

The data were collected using self-administration techniques in several counties of Florida (Alachua, Broward, Calhoun, Franklin, Gadsden, Hardee, Jefferson, Leon, Madison, Orange, Polk, Taylor, and Wakulla). Extension agents in the various counties, other technical personnel from Florida A&M University, as well as a graduate student from Alabama helped with collecting the data.

The data were collected in the summer of 2013 through the summer of 2015. The final sample comprised 404 participants, and this was considered adequate for analysis. The Cronbach's alpha was 0.61, which is relatively good (Goforth, 2015).

## ANALYSIS

Data were analyzed by means of descriptive statistics and ordinal logit regression analysis. The regression model used a modified version of the one used by Banterle & Cavaliere (2009), and is stated as follows:

$$C_j(X_i) = \ln[P(Y>j|X_i)/P(Y\leq j|X_i)] = \beta_1 X_{i1} + \dots + \beta_n X_{in} - \tau_j + 1 \quad (1)$$

Where:

$C_j(X_i)$  = cumulative odds of being at or below category  $j$  of an ordinal variable with  $k$  categories,

$1 \leq j \leq k-1$

$i$  = number of participants considered

$j$  = score for a category

$Y$  = dependent variable

$n$  = number of independent variables

$X_i$  = independent variables

$\beta_i$  = coefficients

$\tau$  = cut points between categories



Two models were used; the estimation model for Model 1 is stated as:

$$\ln (PWTP_{>j}/PWTP_{\leq j}) = \beta_1 HHS + \beta_2 GEN + \beta_3 RAE + \beta_4 AGE + \beta_5 EDU + \beta_6 HHI + \beta_7 MAS - \tau + 1 \quad (2)$$

Where:

$\ln (PWTP_{>j}/PWTP_{\leq j})$  = cumulative odds of being at or below a willingness to pay (WTP) category

HHS = Household size

GEN = Gender

RAE = Race/ethnicity

AGE = Age

EDU = Education

HHI = Household income

MAS = Marital status

Therefore, the estimation model hypothesizes that the willingness to pay more for beef or goat meat certified as locally or regionally produced is influenced by household size, gender, race/ethnicity, age, education, household income, and marital status. It was assumed that the expected signs of the independent variables were not known a priori (i.e., signs could be positive or negative). The details of the independent variable names and descriptions used for Model 1 are shown in Table 1.

An identical model, Model 2, was set up for meat attributes as follows:

$$\ln (PWTP_{>j}/PWTP_{\leq j}) = \beta_1 SAF + \beta_2 NDI + \beta_3 AVA + \beta_4 AFF + \beta_5 QUA + \beta_6 DES + \beta_7 HYG - \tau + 1 \quad (3)$$

Where:

$\ln (PWTP_{>j}/PWTP_{\leq j})$  = cumulative odds of being at or below a willingness to pay (WTP) category.

SAF = Safety

NDI = No Difference in safety

AVA = Availability

AFF = Affordability

QUA = Quality

DES = Desirability

HYG = Hygiene

Table 1: Variable Definitions and Description of Data for Model One

Variable	Description	Mean	Standard Deviation
Household Size	1-6	2.36	1.10
Gender	1 = male 0 = female	0.26	0.44
Race/ethnicity	1 = Black 2 = White 3 = other	1.76	0.52
Age	1 = 20-24 2 = 25-34 3 = 35-44 4 = 45-54 5 = 55-64 6 = 65 or above	4.36	1.41
Education	1 = high school or less 2 = two-year/technical 3 = some college 4 = college degree 5 = post-graduate/professional	3.69	1.22
Household income	1 = \$10,000 or less 2 = \$10,001-20,000 3 = \$20,001-30,000 4 = \$30,001-40,000 5 = \$40,001-50,000 6 = \$50,001-60,000 7 = \$60,001-70,000 8 = more than \$70,000	5.51	2.17
Marital status	1 = single, never married 2 = married 3 = separated 4 = divorced 5 = widowed	2.34	1.11

Here, the estimation model hypothesizes that willingness to pay more for beef or goat meat certified as locally or regionally produced is influenced by the perception of being safe to consume, no difference between the safety of locally or regionally produced product and non-locally or regionally produced product, availability of product, affordability of product, quality (taste and texture) of product, desirability (appearance and smell) of product, and hygiene of product. Again, it was assumed that the expected signs of the independent variables were not known a priori.

The details of the independent variable names and descriptions used for Model 2 are shown in Table 2. The details of the descriptions for the dependent variable categories,

willingness to pay more for beef or goat meat certified as locally or regionally produced are summarized in Table 3. The ordinal logistic regression analysis was run for the models, using SPSS 12.0<sup>®</sup> (MapInfo Corporation, Troy, NY). The criteria used to assess the model were the model chi-square, beta coefficients, and *p* values.

Table 2: Variable Definitions and Description of Data for Model Two

Variable	Description	Mean	Standard Deviation
Safety	0 = strongly disagree 1 = disagree 2 = neutral 3 = agree 4 = strongly agree	2.72	0.78
No Difference	0 = strongly disagree 1 = disagree 2 = neutral 3 = agree 4 = strongly agree	1.75	0.99
Availability	0 = strongly disagree 1 = disagree 2 = neutral 3 = agree 4 = strongly agree	2.92	0.77
Affordability	0 = strongly disagree 1 = disagree 2 = neutral 3 = agree 4 = strongly agree	2.84	0.93
Quality	0 = strongly disagree 1 = disagree 2 = neutral 3 = agree 4 = strongly agree	2.87	0.90
Desirability	0 = strongly disagree 1 = disagree 2 = neutral 3 = agree 4 = strongly agree	2.84	0.90
Hygiene	0 = strongly disagree 1 = disagree 2 = neutral 3 = agree 4 = strongly agree	1.80	1.17

Table 3: Variable Definition and Description of Willingness to Pay Categories

Variable	Description	Mean	Standard Deviation
Willingness to Pay	No = no 1 = 1-5 cents 2 = 6-10 cents 3 = 11-15 cents 4 = 16-20 cents 5 = more than 20 cents	0	2.09

## RESULTS AND DISCUSSION

Table 4 shows the socioeconomic factors of the respondents and willingness to pay. About 82% had 1-3 persons in their households and 17% had 4-6 persons in their households. The mean household size was 2 (not shown in Table). About 74% of the respondents were females; 28% were Blacks, and 67% were Whites. Also, 27% were 44 years or younger and 72% were older than 44 years of age; 29% had a two-year/technical degree or some college education, and 63% had a college degree. Furthermore, 19% earned \$30,000 or less as annual household income; 70% earned over \$30,000 as annual household income (including 37% of the latter who earned at least \$60,000); 40% were singles and 58% were married. The respondents comprised more females than males, more Whites than Blacks, more middle-aged or older persons than younger persons, with relatively high educational levels, with moderate household incomes, and more married persons than singles. Also, these socioeconomic factors differ from those obtained by Tackie et al. (2015) for Alabama, except for household size where 1-3 person household sizes dominated. About 13% were not willing to pay more for beef or goat meat (related products) if it were certified as locally or regionally produced; 20% were willing to pay 1-5 cents more; 30% were willing to pay 6-10 cents more, and 24% were willing to pay 11-15 cents more. The willingness to pay more, in this case, is more evenly spread out compared to Tackie et al. (2015) where the pattern was more skewed toward 1-5 and 6-10 cent groups.

Table 4: Socioeconomic Factors and Willingness to Pay (N = 404)

Variable	Frequency	Percent
<b>Household Size</b>		
1	73	18.1
2	204	50.5
3	55	13.6
4	45	11.1
5	18	4.5
6	4	1.0
No Response	5	1.2

Table 4...

<b>Gender</b>		
Male	104	25.7
Female	300	74.3
<b>Race/Ethnicity</b>		
Black	113	28.0
White	271	67.1
Other	18	4.5
No Response	2	0.5
<b>Age</b>		
20-24 years	8	2.0
25-34 years	53	13.1
35-44 years	47	11.6
45-54 years	62	15.3
55-64 years	136	33.7
65 years or older	93	23.0
No Response	5	1.2
<b>Educational Level</b>		
High School Graduate or Below	32	7.9
Two-Year/Technical Degree	38	9.4
Some College	78	19.3
College Degree	129	31.9
Post-Graduate/Professional Degree	124	30.7
No Response	3	0.7
<b>Annual Household Income</b>		
\$10,000 or less	14	3.5
\$10,001-20,000	32	7.9
\$20,001-30,000	30	7.4
\$30,001-40,000	43	10.6
\$40,001-50,000	39	9.7
\$50,001-60,000	49	12.1
\$60,001-70,000	62	15.3
Over \$70,000	88	21.8
No Response	47	11.6
<b>Marital Status</b>		
Single, never married	67	16.6
Married	235	58.2
Separated	11	2.7
Divorced	59	14.6
Widowed	24	5.9
No Response	8	2.0
<b>Willingness to Pay More</b>		
No	53	13.1
Yes, between 1 and 5 cents more	81	20.0
Yes, between 6 and 10 cents more	120	29.7
Yes, between 11 and 15 cents more	97	24.0
Yes, between 16 and 20 cents more	5	1.2
Yes, over 20 cents more	39	9.7
No Response	9	2.2

Table 5 depicts attitudes and beliefs about selected attributes of locally or regionally produced beef or goat meat. Nearly 61% agreed or strongly agreed that locally or regionally produced beef or goat meat is generally safe to consume (safety); 21% agreed or strongly agreed that there is no difference between the safety of locally or regionally produced beef or goat meat and non-locally or regionally produced beef or goat meat (no difference in safety); 73% agreed or strongly agreed that they would buy locally or regionally produced beef or goat meat if it were more readily available (availability); 66% agreed or strongly agreed that they would buy locally or regionally produced beef or goat meat if it were cheaper (affordability); 68% agreed or strongly agreed that they would buy locally or regionally produced beef or goat meat if it were of equal quality [taste and appearance] as non-locally or regionally produced beef or goat meat (quality).

Moreover, another 68% agreed or strongly agreed that they would buy locally or regionally produced beef or goat meat if it were of equal desirability [appearance and smell] as non-locally or regionally produced beef or goat meat (desirability); 32% agreed or strongly agreed that they would buy locally or regionally produced beef or goat meat not worrying about how it was raised if it appeared hygienic and wholesome (hygiene). Both the no difference in safety attribute and hygiene attribute reflected less than 35% agreed or strongly agreed, indicating either a strong “neutral factor” or a tilt toward disagreed/strongly disagreed, implying that either respondents were not sure or they simply disagreed with the questions on the two attributes. In addition, the pattern of these findings are in agreement with Tackie et al. (2015), in which they found higher percentages for agree or strongly agree for all meat attributes, except for the no difference in safety and hygiene attributes. Also, similar to this study, Berges et al. (2015), Cicia & Colantuon (2012), and Neme (2011) reported that consumers were concerned about the safety of meat products.

Table 5: Attitudes and Beliefs about Selected Attributes of Locally or Regionally Produced Beef or Goat Meat (N = 404)

Variable	Frequency	Percent
<b>Locally or Regionally Produced Beef or Goat Meat is Generally Safe to Consume</b>		
Strongly Agree	60	14.9
Agree	185	45.8
Neutral	133	32.9
Disagree	19	4.7
Strongly Disagree	0	0.0
No Response	7	1.7

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**No Difference between Safety of Locally or Regionally Produced Beef or Goat Meat and Non-Locally or Regionally Produced Beef or Goat Meat**

Strongly Agree	17	4.2
Agree	68	16.8
Neutral	145	35.9
Disagree	129	31.9
Strongly Disagree	35	8.7
No Response	10	2.5

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**Would Buy Locally or Regionally Produced Beef or Goat Meat if More Readily Available**

Strongly Agree	84	20.8
Agree	212	52.5
Neutral	88	21.8
Disagree	10	2.5
Strongly Disagree	3	0.7
No Response	7	1.7

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**Would Buy Locally or Regionally Produced Beef or Goat Meat if Cheaper**

Strongly Agree	106	26.2
Agree	159	39.4
Neutral	112	27.7
Disagree	18	4.5
Strongly Disagree	7	1.7
No Response	2	0.5

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**Would Buy Locally or Regionally Produced Beef or Goat Meat if of Equal Quality as Non-Locally or Regionally Produced Beef or Goat Meat**

Strongly Agree	103	25.5
Agree	171	42.3
Neutral	104	25.7
Disagree	14	3.5
Strongly Disagree	7	1.7
No Response	5	1.2

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**Would Buy Locally or Regionally Produced Beef or Goat Meat if of Equal Desirability as Non-Locally or Regionally Produced Beef or Goat Meat**

Strongly Agree	94	23.3
Agree	181	44.8
Neutral	99	24.5
Disagree	19	4.7
Strongly Disagree	7	1.7
No Response	4	1.0

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<b>Would Buy Locally or Regionally Produced Beef or Goat Meat not Worrying about how Raised if it Appeared Hygienic or Wholesome</b>		
Strongly Agree	26	6.4
Agree	104	25.7
Neutral	90	22.3
Disagree	120	29.7
Strongly Disagree	58	14.4
No Response	6	1.5

Table 6 presents estimates for Model 1, socioeconomic factors and their effects on willingness to pay more for beef or goat meat certified as locally or regionally produced. It reveals overall significance of the model ( $p = 0.001$ ), i.e., at least one or all of the socioeconomic variables jointly explain the dependent variable (willingness to pay more for beef or goat meat certified as locally or regionally produced, WTP). Willingness to pay more for beef or goat meat certified as locally or regionally produced is significantly affected by race/ethnicity and education, respectively,  $p = 0.000$  and  $p = 0.055$ . Therefore, race/ethnicity and education contribute greatly to willingness to pay more for beef or goat meat certified as locally or regionally produced. For race/ethnicity, a plausible explanation is that White respondents are more likely and willing to pay more for beef or goat meat certified as locally or regionally produced than Black respondents, because Whites generally have more financial resources than Blacks, and hence, willing to pay more. Also, the higher the educational level, the more likely the willingness to pay more for beef or goat meat certified as locally or regionally produced. Perhaps, those who have higher education prefer to support the local or regional meat products, all things equal, compared to those who have lower education. This result on education is similar to Shashikiran and Madhavaiah (2015) who reported that education had a significant positive effect on willingness to purchase organic products, and thus, willingness to pay more for those products.

Table 6: Estimates for Socioeconomic Factors and their Effects on Willingness to Pay More for Beef or Goat Meat Certified as Locally or Regionally Produced

Variable	$\beta$	$P$
Household Size	-0.111	0.212
Gender	-0.240	0.293
Race/ethnicity	0.777***	0.000
Age	-0.119	0.159
Education	0.167**	0.055
Household Income	0.020	0.710
Marital Status	0.039	0.713
Chi-square	25.374***	0.001
Nagelkerke R <sup>2</sup>	0.076	

\*\*\*Significant at 1%; \*\*Significant at 5%



On the contrary, the result is in opposition to the findings of Dobbs et al. (2016) for Tennessee, Tackie et al. (2015) for Alabama, Campiche et al. (2014) for the U.S. Southern Plains, and Carpio & Insengildina (2008) for South Carolina. Dobbs et al. found that age and income significantly affected locally produced beef; Tackie et al. found that household size significantly affected willingness to pay more for beef and goat meat; Campiche et al. found income to have a significant effect on willingness to pay more for natural beef, and Carpio & Insengildina found age, gender, and income to have significant effects on willingness to pay more for locally produced products.

Household income and marital status were statistically insignificant, but had positive relationships with willingness to pay more. In addition, household size, gender, and age were statistically insignificant, but had negative relationships with willingness to pay more. The coefficient for education, for example, implies that for one unit increase in the educational level, the expected ordered log odds increases by 0.17 moving from one category to the next higher category of willingness to pay more for beef or goat meat certified as locally or regionally produced. Similarly, for race/ethnicity, the coefficient means that one unit change (i.e., if a respondent changes from Black to White), the ordered log odds increases by 0.78 moving from one category to the next higher category of willingness to pay more for beef or goat meat certified as locally or regionally produced. In other words, an increase in education or a change of race/ethnicity (from Black to White) will cause an increase in the willingness to pay more in said magnitude. Identical explanations apply to the other independent variables in Model 1.

Table 7 presents estimates for Model 2, meat attributes and their effects on willingness to pay more beef or goat meat certified as locally or regionally produced. It also reveals an overall significance of the model ( $p = 0.000$ ), i.e., at least one or all of the meat attributes jointly explain the dependent variable (willingness to pay more for beef or goat meat certified as locally or regionally produced, WTP). Willingness to pay more for beef or goat meat certified as locally or regionally produced is significantly affected by perception of being safe to consume (safety); no difference between the safety of locally or regionally produced beef or goat meat and non-locally or regionally produced beef or goat meat (no difference in safety), availability, and hygiene, respectively,  $p = 0.019$ ,  $p = 0.014$ ,  $p = 0.000$ , and  $p = 0.059$ . For safety, the stronger the perception that beef or goat meat certified as locally or regionally produced is safe to consume, the more the willingness to pay more for it. Consumers generally want safe products; therefore, when the perception of safety is high, obviously, they will be more willing to pay more for the said product compared to an identical product. For no difference in safety, the stronger the perception that there is no difference in safety between beef or goat meat certified as locally or regionally produced and beef or goat meat non-locally or regionally produced, the less the

willingness to pay more for the product. In this case, the logical explanation is that if consumers perceive that two products are not identical in attributes, they would certainly want to pay more for the product whose attributes they prefer compared to the other, and vice versa.

Table 7: Estimates for Product Attributes and their Effects on Willingness to Pay More for Beef or Goat Meat Certified as Locally or Regionally Produced

Variable	$\beta$	$P$
Safety	0.321***	0.019
No Difference	-0.246***	0.014
Availability	0.858***	0.000
Affordability	-0.149	0.271
Quality	-0.157	0.396
Desirability	0.128	0.486
Hygiene	-0.155*	0.059
Chi-square	67.916***	0.000
Nagelkerke $R^2$	0.171	

\*\*\*Significant at 1%; \*Significant at 10%

For availability, the stronger the perception that beef or goat meat certified as locally or regionally produced is readily available the more the willingness to pay more for it. The reason is that respondents may value the availability attribute highly, all things equal; and consequently, willing to pay more for it. For hygiene, the stronger the perception that beef or goat meat certified as locally or regionally produced is hygienic and wholesome (hygiene), the less the willingness to pay more for it. The latter result may be due to the fact that consumers expect meat sold to be hygienic and wholesome anyway so they do not expect to pay more for this attribute. These findings are generally in agreement with Tackie et al. (2015) for Alabama. In their study, they also found that safety positively and significantly affected willingness to pay more for beef and goat meat certified as locally and regionally produced. Whereas, they found no difference in safety and hygiene to negatively and significantly affect willingness to pay more for beef and goat meat certified as locally or regionally produced. Furthermore, regarding the attribute of safety, the findings agree with Fadiga (2010) and Cicia and Colantuon (2012) who also reported consumers willing to pay more for safety.

Desirability (appearance and smell) of product was statistically insignificant, but had a positive relationship with willingness to pay more. Affordability of product and quality (taste and texture) of product were statistically insignificant, but had negative relationships with willingness to pay more. One thing has to be said about affordability. Affordability is linked to price, and its relationship clearly shows that if consumers perceive locally or regionally produced meats as not being affordable, then they would buy less of these meats. Here again, the coefficient for

safety, for instance, means that if the perception of safety increases by one unit, the expected ordered log odds increases by 0.32 moving from one category to the next higher category of willingness to pay more for beef or goat meat certified as locally or regionally produced. Put it another way, an increase in the perception of safety will cause an increase in the willingness to pay more by the aforementioned magnitude. Similar interpretations apply to the other independent variables in Model 2.

## CONCLUSION

The study assessed the impact of socioeconomic factors and meat attributes on willingness to pay for locally or regionally produced livestock products in Florida. Specifically, it identified and described socioeconomic factors; described and assessed meat attributes, and estimated the extent to which socioeconomic factors and meat attributes affected the willingness to pay more for locally or regionally produced meat products. The socioeconomic factors comprised more females than males, more Whites than Blacks, more middle-aged or older persons than younger persons, with relatively high educational levels, with moderate household incomes, and more married persons than singles.

Also, 50% were willing to pay 1-10 cents more for beef or goat meat certified as locally or regionally produced. Moreover, a majority (at least 61%), agreed or strongly agreed with the perceptions on selected meat attributes, except in the cases of the no difference in safety and hygiene attributes. The regression results showed that, regarding the socioeconomic factors, race/ethnicity and education had significant effects on the willingness to pay more for beef or goat meat certified as locally or regionally produced. Considering, the meat attributes, safety (safe to consume), no difference in safety, availability, and hygiene had significant effects on the willingness to pay more for beef or goat meat certified as locally or regionally produced.

Based on the above findings and considering that willingness to pay more for beef or goat meat certified as produced locally or regionally may be ideal, only two of the socioeconomic factors, race/ethnicity and education, had statistically significant impact on willingness to pay more. Also, four out of seven meat attributes, particularly, safety, no difference in safety, availability, and hygiene, had statistically significant impacts on willingness to pay more. The study has provided critical information as to how socioeconomic factors and meat attributes affect willingness to pay more for beef or goat meat certified as locally or regionally produced. Key contributions are the indication that race/ethnicity, education, safety (safe to consume), no difference in safety (between beef or goat meat certified as locally or regionally produced and beef or goat meat non-locally or regionally produced), availability, and hygiene affect the willingness to pay more for beef or goat meat certified as locally or regionally

produced. The implications for the study are that socioeconomic factors and meat attributes do matter, and should be considered when conducting studies on the consumption of locally or regionally produced livestock products and willingness to pay more for “specialized meats.” It stands to reason that these two sets of “factors” should also be considered in the production and marketing of locally or regionally produced livestock products. Future studies are suggested to confirm the results of the study, or examine the issues from different perspectives. For example, the study could be replicated in the same study area, or could be conducted to cover a wider geographic area. Another focus could be narrowing down the attributes to about two or three at a time and conducting in-depth analysis on them. That way, minute intricacies can be teased out to provide more illumination to researchers, outreach providers, producers, marketers, policymakers, and others of the public who are interested in local, regional and/or sustainable production. Consequently, this will lead to better serving consumers.

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