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RESEARCH ARTICLE

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Estimating restaurant willingness to pay for local beef

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Abstract

We suggest an approach for estimating restaurant willingness to pay (WTP) for local foods. Using a telephone survey of Tennessee restaurants and the contingent valuation method, we estimate restaurant WTP for Tennessee Certified Beef (TCB). Probit regressions were used to determine the factors associated with restaurant decisions to purchase TCB ground beef and sirloin steak. Beef price was negatively associated with restaurant adoption of TCB. Restaurants that were located in a city, located in the eastern region of Tennessee, offered local foods, and had a higher percentage of adults as clientele were more likely to purchase TCB ground beef. A restaurant's decision to offer TCB sirloin steak was positively associated with locations in Middle Tennessee, if the restaurant offered local foods, and if managers placed importance on sustainability. This study contributes to understanding local food supply chains and provides a framework for future studies of restaurant WTP for local foods. [EconLit citation: Q130].

KEYWORDS
local foods, restaurant survey, willingness to pay

1 | INTRODUCTION

In recent years, there has been an increase in consumer purchases of local foods (Packaged Facts, 2018). Research has found that consumers are willing to pay premiums for local foods (Adalja, Hanson, Towe, & Tselepidakis, 2015; Brown, 2003; Carpio & Isengildina-Massa, 2009; Gracia, de Magistris, & Nayga, 2012; Merritt, DeLong, Griffith, & Jensen, 2018). For example, consumers surveyed in Missouri (Brown, 2003), Midwestern retail stores (Darby, Batte, Ernst, & Roe, 2008), South Carolina (Carpio & Isengildina-Massa, 2009), Spain (Gracia et al., 2012), and

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Maryland (Adalja et al., 2015) were willing to pay a premium for locally produced foods. Alfnes and Sharma (2010) found that consumers at a Midwestern restaurant were more likely to purchase local foods when they were marginally more expensive than other foods. Dobbs et al. (2016) used a contingent valuation (CV) method in their analysis of consumer willingness to pay (WTP) for Tennessee beef, finding that consumers would pay more for beef that carried a Tennessee label. Merritt et al. (2018) conducted an online consumer choice experiment and found that Tennessee consumers were willing to pay a premium for Tennessee Certified Beef (TCB). Numerous studies have also examined the factors associated with consumer WTP for local foods (Adalja et al., 2015; Brown, 2003; Carpio & Isengildina-Massa, 2009; Darby et al., 2008; Dobbs et al., 2016; Gracia et al., 2012).

The literature about consumer preferences of local foods is considerable, but there are other steps in the supply chain to consider when examining the logistic feasibility and economic sustainability of local food markets. Research reports several barriers to marketing local foods, despite consumer WTP local food premiums. For example, the success of a local food product requires reliable distribution systems, food handling and processing facilities, producer interest in providing the product, and food retailers and restaurant willingness to offer local products in their stores and on their menus (Inwood, Sharp, Moore, & Stinner, 2009; C. B. Lewis & Peters, 2012; McLeod, Jensen, Griffith, & DeLong, 2018; Sharma, Moon, & Strohbehn, 2014; Starr et al., 2003). Consumer preferences (Merritt et al., 2018), producer interest (McLeod et al., 2018), availability of processing facilities (Hughes, Wright, Griffith, & Pepper, 2017), and distribution systems (Menard, Jensen, & English, 2012) have been explored with respect to local foods, but there have been no previous studies regarding restaurant WTP for local foods. Given the growth in restaurants offering farm-to-fork or farm-based menus (Menus of Change, 2017), it is of interest to marketers of local products and researchers to better understand restaurant attitudes toward purchasing and offering local beef options on their menus. Furthermore, while farmers could certainly sell local foods to the consumer by means of a farmers' market or direct farmer-to-consumer sales, additional potential marketing channels exist for selling local foods through grocery stores and restaurants. It is therefore important to examine restaurant adoption of local foods and their WTP for local foods. The aforementioned studies on local foods evaluated consumer preferences for local foods, but not restaurant willingness to include local foods as menu choices. This study contributes to the literature by suggesting an approach for estimating restaurant WTP for local foods. The objective of this study is to examine restaurant WTP for TCB products and to determine the factors contributing to restaurant decisions to adopt this local product.

Despite the abundant literature on consumer preferences for local foods, only three restaurant surveys were identified in this literature review. No studies reviewed estimated restaurant WTP for local foods and the factors affecting restaurants' preference to adopt a specific local food product. Inwood et al. (2009) surveyed restaurants in Ohio and used a “diffusion of innovation” framework to examine the characteristics of restaurants that adopted local foods. They found that chefs were important opinion leaders in restaurant decisions to offer local foods, and barriers for serving local foods included distribution problems and lack of convenience. Starr et al. (2003) analyzed the linkages between farmers and restaurants, focusing particularly on the constraints and opportunities shaping local food markets. Supporting local businesses, reducing environmental impact, choosing locally grown and processed products, and restaurant location in an agricultural region were drivers of restaurant purchasing patterns of local foods. Sharma et al. (2014) surveyed Iowa restaurant managers to determine the factors influencing their purchase of local foods. They found that restaurants already purchasing local foods viewed product uniqueness, order processing time, and nutritional value as important factors influencing their interest in local food products. Additionally, restaurants generally perceived local foods to be of higher quality, were willing to promote local foods, and viewed local produce as “clean.” In all of these studies, restaurants were interviewed or surveyed about the products they were already purchasing, but none of these studies estimated restaurant WTP for local products.

This study adds to previous research on farmer-to-restaurant markets by being the first to examine restaurant WTP for local products. Restaurants are an important sector to examine because the percentage of US household expenditures on food away from home has continued to increase since the 1960s (US Department of Agriculture &

Economic Research Service, 2016). From 2014 to 2016, household expenditures on food away from home were increasing at a higher rate than expenditures on food-at-home (Economic News Release, 2016). There are over 1 million restaurants in the US with projected sales of $825 billion in 2018 (National Restaurant Association, 2019). Findings from this analysis will provide Tennessee cattle producers and restaurant suppliers a market scope and depth profile for TCB products.

2 | METHODS

2.1 | Survey

A telephone survey of Tennessee restaurants was conducted to determine restaurant WTP for Tennessee certified beef. Telephone numbers for restaurants across the state were compiled from publicly available websites such as Pick Tennessee Products (2018) and TripAdvisor (2018). Pick Tennessee Products is a state-sponsored marketing campaign that promotes agricultural products produced in Tennessee.[1] The campaign provides an online directory of restaurants that offer Tennessee products. Restaurants were screened to verify they offered beef products by examining their websites and reviewing menu photos. Chain restaurants were not included in the contact list. Similarly, Inwood et al. (2009) and Starr et al. (2003) did not include chain restaurants in their analysis. Omitting chain restaurants, there were 798 restaurant telephone numbers compiled. A telephone survey was used to ensure the respondent was the primary food purchaser, thereby safeguarding against responses that might not be reflective of the way a restaurant would actually make local food purchases.

The Human Dimensions Research Lab at the University of Tennessee administered the telephone survey in fall 2017. In summer 2017, survey pretests were conducted at local restaurants with the restaurant primary decision maker in the Knoxville area to determine the length of time of completion and assess the clarity and appropriateness of questions. After revising the survey based on pretests responses, a final version of the survey was developed. Individuals at the Human Dimensions Research Lab then called each restaurant and asked to speak to the primary decision maker for beef purchases. If the primary decision maker was unavailable, a callback time was arranged with the restaurant when the primary decision maker could answer the survey. The survey began by asking the respondent if they were 18 years or older, were responsible for making the beef decisions at the restaurant, and if the restaurant currently offered or planned to offer beef products. If the respondent answered "no" to any of these questions, they were excused from the survey.

2.2 | CV method

The CV method was used to estimate restaurant WTP for Tennessee certified beef. The CV method is commonly used to determine WTP for goods and services not currently in the market. There are multiple methods for determining WTP (e.g., experimental auctions and choice experiments), but the CV approach was most conducive for this telephone survey. Dobbs et al. (2016) also used a CV method to elicit consumer WTP for a local Tennessee beef product, allowing for comparison between this study's restaurant WTP estimates and consumer WTP for a similar product.

There are multiple formats that can be used when implementing the CV method, including open-ended questions, bidding games, and discrete choice experiments. According to Hoyos and Mariel (2010), closed-ended CV questions are considered more reliable than open-ended questions, which can potentially introduce bias. Three types of closed-ended CV dichotomous choice methods are widely accepted: single bounded, double bounded, and

[1]To control for any bias from using restaurants on the Pick Tennessee Products list, a variable was included in the regression to account for restaurants that already served local foods.

one-and-one-half bounded (Hoyos & Mariel, 2010). For this study, the single bounded dichotomous choice CV method was applied to elicit restaurant WTP for Tennessee certified beef.

There are several approaches for eliciting consumer WTP including choice experiments (e.g., K. E. Lewis, Grebitus, & Nayga, 2016a; K. E. Lewis, Grebitus, Colson, & Hu, 2017; Merritt et al., 2018; Syrengelas, DeLong, Grebitus, & Nayga, 2018) and incentive compatible experimental auctions (e.g., K. E. Lewis, Grebitus, & Nayga, 2016b). For this study, it was decided to use the CV method because we surveyed restaurants by telephone. From discussions with restaurants during survey pretesting, it was decided that a telephone survey would be the most efficient means for the primary food purchaser for the restaurant to complete our survey and would result in the highest response rate. A choice experiment or auction would not be practical to conduct over the phone. It would also be very difficult to obtain restaurants' primary food purchasers from across Tennessee to drive to a central location to complete an experimental auction. By using a telephone survey, we could easily reach restaurants across the study region. Emailing restaurants' primary food purchasers a link to complete a choice experiment survey could be an option, but we did not have access to restaurants' primary food purchaser email addresses and even if we did, we assumed the response rate would be much greater by conducting the survey by telephone. Additionally, if farmers were interested in selling a TCB product through a restaurant, it is likely they would call the restaurant and speak to the restaurants' primary food purchaser. Our survey methodology reflects this last circumstance.

Hypothetical bias is a potential concern with any WTP elicitation study (Cummings & Taylor, 1999; Tonsor & Shupp, 2011), and is a limitation with our survey as well. However, given our approach to contacting the primary food purchaser is how farmers would actually contact a restaurant to purchase their product, we believe this procedure reduces hypothetical bias. Furthermore, we informed the restaurants that we were using the information from this survey to "better assess the markets for Tennessee-produced beef." Therefore, we also attempted to mitigate hypothetical bias by controlling for survey consequentiality, which involves survey participants believing survey results may affect an outcome they care about (e.g., Herriges, Kling, Liu, & Tobias, 2010; K. E. Lewis et al., 2016a; Vossler, Doyon, & Rondeau, 2012).

The survey contained a CV question corresponding with an 85% lean/15% fat ground beef product and a CV question about a sirloin steak cut. Before the CV questions, respondents were provided the following information: "TCB declares that the animal was born, raised, and harvested in Tennessee and graded US Department of Agriculture (USDA) Choice or Prime." The requirements of the TCB Program guarantee that cattle are from Tennessee and grade USDA Choice or Prime. The grading requirements were chosen because they are the same grading requirements as the Certified Angus Beef Program (Certified Angus Beef, 2018).

Respondents were assigned one of four price levels per pound for TCB ground beef and asked if they would purchase the product at the given price level or a generic ground beef product at a base price of $3.00 per pound.[2] Respondents were also given the option to choose neither product. The assigned price levels for TCB ground beef were $3.00, $4.00, $5.00, or $6.00 per pound. Next, respondents were asked a CV question for purchasing TCB sirloin steak compared with a generic sirloin steak at a $5.00 per pound base price. For the TCB sirloin steak, the price levels assigned were $5.00, $6.50, $8.00, or $9.50 per pound. Prices were determined based on the National Retail Report for beef (US Department of Agriculture & Agricultural Marketing Service, 2017), discussion with local restaurants, and by observing beef prices on the surveyed restaurant menus.

Questions regarding restaurant characteristics and the primary decision maker's attitudes about serving local foods were also included in the survey. These questions originated from a review of restaurant and consumer surveys on local foods (Carpio & Isengildina-Massa, 2009; Dentoni, Tonsor, Calantone, & Peterson, 2009; Duram & Cawley, 2012; Selfa & Qazi, 2005; Starr et al., 2003; Telligman, Worosz, & Bratcher, 2017).

[2]"Generic" beef is the unlabeled and unbranded option.

2.3 | Econometric model

A consumer will purchase one product over another when his or her utility for that product is greater than the utility derived from the other product. McFadden's (1974) random utility model is often used to model this decision, from which WTP for a good or service can be discerned. McFadden's random utility framework is extended to the restaurant's purchasing decision, assuming that a restaurant maximizes profit rather than utility. Following the framework of the random utility model, restaurant r will choose TCB instead of a generic (unlabeled) beef product if its expected profit from purchasing TCB, represented by $E(\Pi_{rTCB})$, is greater than its expected profit from purchasing generic beef, represented by $E(\Pi_{rG})$; that is $E(\Pi_{rTCB}) > E(\Pi_{rG})$.

Determining the probability (Pr) that a restaurant will choose TCB corresponds with the probability that the expected profit from serving TCB will exceed the expected profit from serving a generic beef product. Therefore,

$$Pr[y_{rTCB} = 1] = Pr[E(\Pi_{rTCB}) > E(\Pi_{rG})] = Pr[\boldsymbol{x_r}'\boldsymbol{\beta} + \varepsilon_r > 0] = F(\boldsymbol{x_r}'\boldsymbol{\beta}), \tag{1}$$

where $\boldsymbol{x}'\boldsymbol{\beta}$ are observable elements of the difference between the expected profits; ε the difference between the random elements; and F a cumulative distribution function (Greene, 2012). For this study, $\boldsymbol{x}$ is a vector of independent variables consisting of restaurant characteristics, TCB price, and restaurant manager attitudes toward serving local products. The latent model depicting this choice is

$$y^*_{rTCB} = \boldsymbol{x_r}'\boldsymbol{\beta} + \varepsilon_r, \tag{2}$$

where

$$y_{rTCB} = \begin{cases} 1 & \text{if } y^*_{rTCB} > 0 \\ 0 & \text{otherwise} \end{cases}, \tag{3}$$

because only the decision to purchase TCB is observed and not the actual expected profit.

Two separate regressions were estimated; one for the restaurant's decision to purchase the TCB ground beef product, and the other for the restaurant's decision to purchase the TCB sirloin steak. The dependent variable of the ground beef model was equal to one if a restaurant selected the TCB ground beef product (0 otherwise). The dependent variable in the steak model was equal to 1 if the restaurant selected the TCB sirloin steak (0 otherwise).

The errors of the linear model in Equation (2) are assumed to be normally distributed with an expected value of 0 and a variance of 1 (Greene, 2012). The normal cumulative density function is the probability a restaurant purchases a TCB product, that is

$$Pr[y_{rTCB} = 1] = F(\boldsymbol{x}'\boldsymbol{\beta}) = \int_{-\infty}^{x'\beta} \phi(z)dz = \Phi(\boldsymbol{x}'\boldsymbol{\beta}), \tag{4}$$

where $\phi(z)$ is the probability density function of the standard normal distribution. The log likelihood function is

$$\ln L = \sum_{r=1}^{N}, [y_{rTCB} \ln \Phi(\boldsymbol{x_r}'\boldsymbol{\beta}) + (1 - y_{rTCB}) \ln \{1 - \Phi(\boldsymbol{x_r}'\boldsymbol{\beta})\}], \tag{5}$$

where the vector of $\boldsymbol{\beta}$'s maximizing Equation (5) are the maximum likelihood estimates. Average marginal effects for discrete and continuous variables were calculated according to Wooldridge (2002).

2.4 | Willingness to pay calculations

Results from the model were used to estimate restaurant average WTP for TCB ground beef and sirloin steak with the formula:

$$\widehat{WTP}_{TCB} = -\frac{\hat{\beta}_0 + \boldsymbol{z}'\hat{\boldsymbol{\beta}}_{-p}}{\hat{\beta}_p} \tag{6}$$

where $\hat{\beta}_0$ is the estimated intercept, $\hat{\boldsymbol{\beta}}_{-p}$ is a vector of estimated parameters excluding the price coefficient, $\boldsymbol{z}$ is the vector of independent variables excluding price, and $\hat{\beta}_p$ is the estimated parameter for the price of TCB (Dobbs et al., 2016). WTP was determined as the average over the willingness to pay evaluated for each record.

2.5 | Hypotheses for explanatory variables

Independent variables included in the models, hypothesized signs, and sample means are reported in Table 1. Consistent with demand theory, as the price of TCB (*Price*) increases, restaurants will be less likely to purchase TCB (Table 1). Restaurants located in a city (*City*) were hypothesized to be more likely to purchase TCB products than those located in a suburb, small town, or rural area given the local foods movement has become popular in cities (Clark, 2016). On average, 40% of the surveyed restaurants stated they were located in a city. Three regional dummy variables corresponding with West, Middle, and East Tennessee were also included in the regressions to control for unobserved heterogeneity associated with these regions and determine where a TCB program could be the most successful. We are uncertain how location across the state will influence TCB preferences among restaurants. Nearly 60% of the restaurants surveyed were located in East Tennessee.

Restaurants stated that profitability (*Profits*) and quality (*Quality*) had a greater influence on their decision to offer TCB. It was hypothesized they would be less likely to adopt TCB. This is because a restaurant may consider TCB to be a riskier and possibly a lower quality product than their existing beef products. Restaurants indicating that sustainability issues (*Sustain*) factor into their purchasing decisions would be more likely to purchase TCB because consumers typically consider local products to be more sustainable than products not labeled as local (Megicks, Memery, & Angell, 2012).[3] On average, restaurant owners and managers stated higher expected profits, better quality, and sustainability could influence their choice to offer TCB "a lot" (Table 1). Restaurants already offering local foods (*Local*) were hypothesized to be more likely to purchase TCB. Almost 40% of surveyed restaurants were already offering local products. It was hypothesized that the longer a restaurant had been in business (*YrsBsns*), the less likely it would be to purchase TCB. This reasoning follows because these restaurants have likely used the same supplier for many years and would be less likely to change to TCB. The average number of years restaurants had been in business was 17. It was hypothesized that the more ground beef and sirloin steak purchases the restaurant made per week (*Purch*) the less likely they would be to choose TCB. A reliable supply of local meat can be more difficult to find if the restaurant is purchasing greater volumes of it, given the relative paucity of processing facilities in the state (Hughes et al., 2017). On average, restaurants purchased about 163 pounds of ground beef per week and about 148 pounds of steak per week. The higher the restaurant's seating capacity (*Seating*), the less likely the restaurant was hypothesized to be willing to purchase TCB. Smaller restaurants may find it easier to introduce TCB to their product mix than larger restaurants. Average seating capacity was about 150.

Sixteen percent and 20% of the restaurants in the ground beef and sirloin steak groups, respectively, considered themselves to be fine dining establishments (*FineDining*). The expected signs of the coefficients for *FineDining* were positive because clients frequenting expensive restaurants typically expect premium products. Restaurants with managers who were older (*MgrAge*) were hypothesized to be less likely to offer TCB products. Older individuals are often perceived as less willing to change their habits (Weiss & Maurer, 2004). The average age of managers was 46 (Table 1). It is uncertain how the percentage of clientele that are adults (*Adults*) or families

[3]Participants were not provided a formal definition of sustainability.

TABLE 1 Variable definitions, means, and hypothesized results for the ground beef and sirloin steak model

Variables	Description	Hyp. sign	Ground beef (n = 107)		Sirloin steak (n = 90)	
			Mean	*SD*	Mean	*SD*
Dependent variable						
TCB	Percent of respondents choosing TCB over generic beef		0.46	0.50	0.52	0.50
Independent variables						
Price	Ground beef price levels of $3.00, $4.00, $5.00, or $6.00/lb Steak price levels of $5.00, $6.50, $8.00, or $9.50/lb	−	4.29	1.00	7.17	1.51
City	1 if the restaurant is located in a city, 0 if the restaurant was located in a suburb, small town, or rural area	+	0.39	0.49	0.40	0.49
EastTn	1 if the restaurant is located in East Tennessee, 0 if located in West Tennessee or Middle Tennessee	?	0.59	0.49	0.57	0.50
WestTn	1 if the restaurant is located in West Tennessee, 0 if located in East Tennessee or Middle Tennessee	?	0.18	0.38	0.22	0.42
Profits	Influence of profitability on choice to offer TCB[a]	−	4.17	1.19	4.18	1.24
Quality	Influence of quality on choice to offer TCB[a]	+	4.45	1.06	4.50	1.01
Sustain	Influence of sustainability on choice to offer TCB[a]	+	4.12	1.19	4.27	1.11
Local	1 if the restaurant currently has products labeled as local on their menu, 0 otherwise	+	0.38	0.49	0.36	0.48
YrsBsns	Number of years the restaurant has been in business	−	16.53	18.55	16.56	18.97
Purch	Pounds of ground beef/steak purchased per week	−	162.59	190.74	148.48	276.78
Seating	Seating capacity of the restaurant	−	144.22	102.80	154.73	109.11
FineDining	1 if the restaurant is classified as fine dining, 0 otherwise	+	0.16	0.37	0.20	0.40
MgrAge	Age of manager/owner	−	46.04	12.44	45.98	12.03
Adults	Percentage of clientele that are adults	?	59.57	23.62	57.56	23.88
Families	Percentage of clientele that are families	?	47.79	24.63	47.60	24.94

Note. SD: standard deviation.

[a]1 = *not at all*, 2 = *influence slightly*, 3 = *influence moderately*, 4 = *influence a lot*, and 5 = *influence extremely*.

(*Families*) would impact restaurants' decision to offer TCB, given that no previous literature has yet examined this issue. Overall, a higher percentage of the clientele were adults than families.

3 | RESULTS

3.1 | Tennessee restaurants' preferences for TCB

The survey had an overall response rate of 19% with 152 restaurants responding to the telephone survey. After eliminating records with missing information, there were 107 records available for analysis of the ground beef model (13% response rate) and 90 observations available for analyses of the sirloin steak model (11% response rate).

Figure 1 shows the percentages of restaurants indicating they would purchase TCB products at each price level as opposed to the generic beef at a base price. As expected, for both TCB ground beef and sirloin steak, the percentage of restaurants indicating they would purchase the TCB product decreased with each increase in the price of TCB. For ground beef, almost 93% of the restaurants indicated they would purchase the TCB product over the generic ground beef product when both were $3.00 per pound. However, only 35% of restaurants chose TCB at $4.00 per pound over the generic ground beef product at $3.00 per pound. The purchasing pattern continued to decline to 29% when the TCB price was $5.00 per pound and to 14% when TCB product was $6.00 per pound. For the sirloin steak, 95% of restaurants indicated they would purchase the TCB sirloin steak rather than generic sirloin steak when both products were $5.00 per pound. When the TCB sirloin steak was $6.50 per pound compared with generic sirloin steak at $5.00 per pound, 54% of restaurants still chose the TCB product. Thirty-eight percent of the restaurants chose TCB sirloin steak when its price was $8.00 per pound, and 21% chose $9.50 per pound TCB sirloin steak over a generic sirloin steak at $5 per pound.

Overall, 46% of restaurants chose TCB ground beef and 52% of the respondents surveyed chose TCB sirloin steak regardless of price point (Table 1). In comparison, Dobbs et al. 's (2016) study of Tennessee consumers found 36% of consumers chose Tennessee ground beef and 42% chose Tennessee steak regardless of price point. Dobbs et al. (2016) price points were $3.36 to $5.88 for ground beef compared with this study's price point range of $3.00

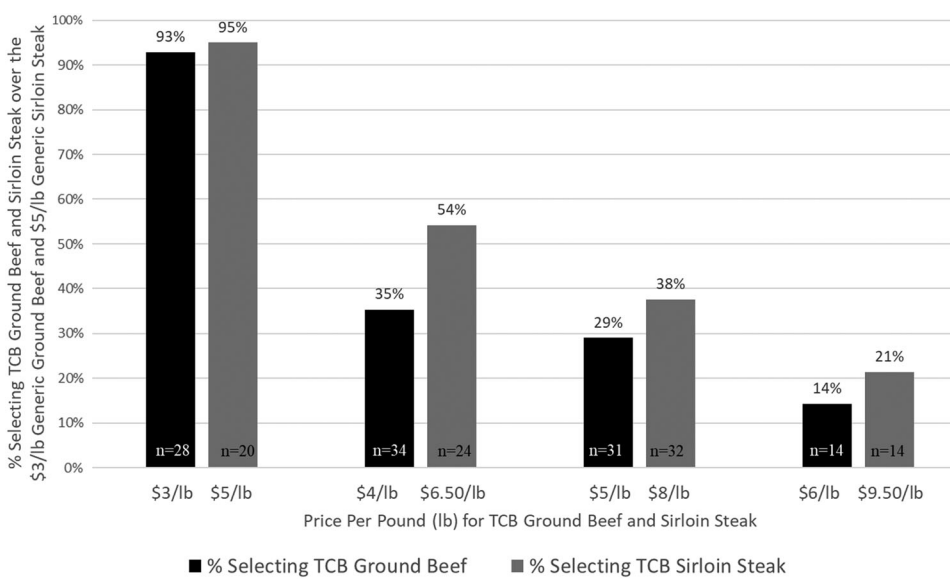

FIGURE 1 Percentage of restaurants selecting Tennessee Certified Beef (TCB) ground beef and sirloin steak over the $3/lb generic ground beef and $5/lb generic sirloin steak

to $6.00. Dobbs et al. (2016) used steak prices ranging from a base price of $9.25 per pound to $16.19 per pound compared with the steak prices used in this study, which ranged from $5 per pound to $9.50 per pound. In addition, Dobbs et al. (2016) surveyed consumers in a retail situation compared with this survey of restaurants in a "wholesale" situation.[4] Overall, these results suggest that restaurants were more likely to buy TCB beef than Tennessee consumers.

3.2 | Factors affecting restaurant preferences for TCB

Variance inflation factors (VIF) were calculated for both models to determine if multicollinearity was affecting estimates of the standard errors. None of the variables' coefficient standard errors had VIF scores exceeding 10. The average VIF across all standard errors of the coefficients was 1.50 for the ground beef model and 1.54 for the sirloin steak model. The VIF results suggest that multicollinearity is not inflating the standard errors of the estimates for either model. Additional collinearity tests were conducted using the StataCorp (2017) *coldiag2* command. The condition index number for the ground beef variables was 27.01 and was 27.37 for the sirloin steak model. Both indices are below 30, again supporting the VIF results (Belsley, 1991).

The average marginal effects of the choice models appear in Table 2. As hypothesized, higher prices for TCB ground beef were associated with lower demand for the product. The probability of a restaurant purchasing TCB product decreased as the per unit price increased. Restaurants were 23% less likely to purchase TCB ground beef and 16% less likely to purchase TCB sirloin steak, given a 1$ per pound increase in the price of the TCB product (Table 1). Restaurants located in a city compared with being located in a suburb, small town, or rural area (*City*) had a higher probability of choosing TCB ground beef. This is consistent with expectations as local foods movements have become especially popular in urban places (Clark, 2016). However, being located in a city was not significant in the sirloin steak model. A restaurant's likelihood of purchasing TCB ground beef increased by 20% if located in a city. Restaurants located in East Tennessee (*EastTn*), relative to Middle TN, were 16% more likely to choose the TCB ground beef product. Meanwhile, restaurants were 24% less likely to choose TCB sirloin steak if they were located in West Tennessee (*WestTn*) relative to Middle Tennessee.

As restaurants were more concerned that offering TCB would influence their profits (*Profits*), restaurants were 9% less likely to choose TCB sirloin steak. This variable did not have an influence on restaurants' decision to offer ground beef. Surprisingly, the influence of quality in the decision to offer TCB (*Quality*) did not have an influence on a restaurant choosing to offer TCB ground beef or sirloin steak. This could be explained by previous research suggesting that consumers (Brown, 2003) and restaurants (Sharma et al., 2014) perceive local foods to be of higher quality. Restaurants were 18% more likely to choose TCB sirloin steak as their importance of sustainability (*Sustain*) increased by one unit on the Likert scale. Restaurants already offering local foods (*Local*) to their customers were 24% more likely to choose TCB ground beef and 29% more likely to choose TCB sirloin steak. This is consistent with Sharma et al. (2014), who found that restaurants were willing to promote local foods and viewed local products as "clean", and Starr et al. (2003) who found supporting local businesses, choosing locally grown products, and minimizing environmental impact were factors influencing restaurants' decision to purchase local foods. Furthermore, Megicks et al. (2012) found that consumers consider local products more sustainable than nonlocal products.

The number of years a restaurant was in business (*YrsBsns*) and the amount of ground beef/steak the restaurant purchased (*Purch*) did not have an impact on a restaurant choosing TCB ground beef or sirloin steak. This is unexpected as it was hypothesized that restaurants that had been in business a longer amount of time might already have a steady supplier of beef and restaurants purchasing a large volume of beef might have concerns about the reliability of the local beef supply (Hughes et al., 2017). However, a restaurant was 6% less likely to offer

[4]It is likely the restaurants in our study viewed our prices as a wholesale price as they would need to serve it to customers at a higher price than they paid for it to make money.

TABLE 2 Probit model results and marginal effects for the ground beef and sirloin steak models

	Ground beef		Sirloin steak	
Variables	Coefficient	Marginal effect	Coefficient	Marginal effect
Price	−1.05*** (0.19)	−0.23*** (0.02)	−0.86*** (0.16)	−0.16*** (0.02)
City	0.95* (0.40)	0.20** (0.07)	0.28 (0.35)	0.05 (0.06)
EastTn	0.76* (0.39)	0.16* (0.08)	−0.37 (0.43)	−0.07 (0.08)
WestTn	−0.10 (0.50)	−0.02 (0.11)	−1.32* (0.53)	−0.24* (0.10)
Profits	0.11 (0.16)	0.02 (0.03)	−0.51** (0.20)	−0.09* (0.04)
Quality	0.31 (0.27)	0.07 (0.06)	0.05 (0.24)	0.01 (0.04)
Sustain	0.31 (0.22)	0.07 (0.05)	0.99*** (0.24)	0.18*** (0.04)
Local	1.13** (0.36)	0.24** (0.07)	1.57** (0.51)	0.29*** (0.08)
YrsBsns	−0.00 (0.01)	−0.00 (0.00)	−0.02 (0.01)	−0.00 (0.00)
Purch	−0.00 (0.00)	−0.00 (0.00)	−0.0005 (0.0007)	−0.00 (0.00)
Seating	−0.00 (0.00)	−0.00 (0.00)	−0.003* (0.002)	−0.0006* (0.0003)
FineDining	−0.60 (0.53)	−0.13 (0.11)	−1.67** (0.59)	−0.31** (0.10)
MgrAge	0.01 (0.01)	0.00(0.00) (0.00)	0.0003 (0.01)	0.00 (0.00)
Adults	0.02** (0.01)	0.004** (0.00)	0.01 (0.01)	0.00 (0.00)
Families	−0.00 (0.01)	−0.00 (0.00)	−0.01 (0.01)	−0.002* (0.001)
Constant	−1.41 (1.49)		5.19** (2.00)	
Observations	107		90	
Pseudo R^2	0.442		0.518	
Wald χ^2 (15)	54.20***		56.72***	

Note. Standard errors in parentheses.
*$p < 0.1$.
**$p < 0.01$.
***$p < 0.001$.

TCB sirloin steak as its seating capacity increased by 100 seats, which is consistent with Hughes (2017). This also could suggest that smaller farm-to-table restaurants would be more interested in serving TCB sirloin steak than larger restaurants. However, Sharma et al. (2014) did not find a relationship between seating capacity and restaurants' expenditures on local foods.

Fine dining restaurants (*FineDine*) were 31% less likely to choose TCB sirloin steak. The age of the manager responding to the survey did not have an impact on TCB purchases, which is consistent with expectations as older individuals are often perceived as less willing to change their habits (Weiss & Maurer, 2004). A 10% increase in adult clientele (*Adults*) increased the probability a restaurant would choose TCB ground beef by 4%. A 10% increase in the number of families (*Families*) represented in their clientele increased the probability a restaurant would choose TCB ground beef by 2%. Overall, these results suggest that restaurant personnel make beef purchasing decisions based on certain factors for ground beef that are different from factors influencing their purchase of sirloin steak.

3.3 | Willingness to pay

The mean WTP of restaurants for TCB ground beef was $4.09 per pound, a $1.09 per pound (36%) premium above the base price level for generic ground beef. For TCB sirloin steak, the mean WTP of restaurants was $7.41 per pound, a $2.41 per pound (48%) premium above the base price for generic sirloin steak. Dobbs et al. (2016) also reported higher premiums for Tennessee steak than for Tennessee ground beef with consumer WTP for Tennessee ground beef of $5.02 per pound, a $1.66 per pound (49%) premium above the base price. Their WTP for Tennessee steak was $14.31 per pound, a $5.06 per pound (55%) premium above the base price. The percentage premiums for TCB from this study are lower than premiums reported by Dobbs et al. (2016). This result could reflect that, unlike consumers purchasing beef at retail prices, restaurants purchase beef at a wholesale price, add value to the product, and then serve the beef at a higher price to customers. This difference could also indicate that hypothetical bias of those managing a business is lower than that of the average consumer. However, Carpio and Isengildina-Massa (2009) also used the CV method and found that South Carolina consumers were willing to pay a premium of 27% for local produce and 23% for local animal products. Therefore, our premiums for restaurants' WTP for TCB were greater than premiums found by Carpio and Isengildina-Massa (2009). Overall, our result that restaurants were willing to pay more for local beef is consistent with previous research on local foods that found consumers are willing to pay more for local foods (e.g., Adalja et al., 2015; Brown, 2003; Carpio & Isengildina-Massa, 2009; Gracia et al., 2012; Merritt et al., 2018).

4 | DISCUSSION AND CONCLUSIONS

In recent years, consumer demand for local foods has increased and there has been an increase in food away-from-home purchases. Thus, restaurant perceptions for local food products have become increasingly important. Although research on consumer perceptions for local food is abundant, no study has examined restaurant WTP for local foods and the factors influencing restaurant decisions to source local foods. Therefore, we develop an approach for estimating restaurant WTP for local foods. This study analyzed the willingness of restaurants to purchase TCB ground beef and sirloin steak, along with the factors influencing the restaurants' decision to purchase a hypothetical TCB product.

Results indicate that restaurants were interested in purchasing TCB ground beef and sirloin steak. On average, restaurants would be willing to pay premiums for both products. Factors influencing restaurant adoption of TCB products included product price, restaurant location, the type of clientele, the restaurant's current menu items, concerns for profit and sustainability, and whether the restaurant perceived itself to be a “fine dining” establishment. Restaurants located in a city, located in East Tennessee compared with Middle Tennessee, who were already selling local foods, and whose clientele were typically adults were most likely to adopt TCB ground beef. Restaurants already serving local foods, not self-classified as fine dining, located in Middle Tennessee compared with West Tennessee, less concerned with profitability and more concerned with

sustainability were most likely to adopt TCB sirloin steak. These results provide information to potential providers of TCB regarding the characteristics and location of their largest potential markets. For example, Tennessee cattle producers who want to sell locally produced ground beef should do so in a restaurant already selling local foods, located in a city (as opposed to suburb, small town, or rural area) in East Tennessee whose clientele were typically adults.

Restaurants were willing to pay premiums of 36% and 48% for TCB ground beef and TCB steak, respectively. This indicates that TCB suppliers would expect higher premiums from selling a TCB steak product than a TCB ground beef product to restaurants. WTP premiums for TCB from this study were lower than those of Dobbs et al. (2016), who found that consumers were willing to pay 49% and 54% for Tennessee ground beef and steak, respectively. This result might reflect that restaurants purchase beef at wholesale prices compared with consumers who purchase beef at retail prices. Alternatively, this could indicate that the hypothetical bias of restaurants might be lower than that of consumers. Future research could further examine the difference in WTP estimates between general consumer and restaurant samples to determine if this difference exists between other food products and the reasons why. Furthermore, limitations of this study include conducting a hypothetical survey to determine restaurant WTP for local foods; thus, hypothetical bias could have resulted in the premiums we found for TCB to be higher than in reality. Future research could conduct an incentive compatible survey to better control for hypothetical bias. This study provides an approach for estimating restaurant WTP for local foods. The results of study provide useful information for producers in marketing TCB, and on a broader scale, this study serves as an example for future studies of restaurants' WTP for products.

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