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Consumer Preferences for State-Sponsored Designations: The Case of the Missouri Grown Label

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There is much empirical evidence of consumer preferences for food products with state-sponsored designations. However, the behavioral characteristics that form the foundation of such consumer preferences are unknown. Using a choice experiment, we explain preferences for the Missouri Grown state-sponsored designation from the perspective of consumer ethnocentrism. According to the results, most consumers have a significant willingness-to-pay for the Missouri Grown label. However, the price premium is substantially higher for consumers who think that products from Missouri conform with in-group preferences. These novel findings imply a strong motivation for producers and legislators to expand adoption and support of state-sponsored programs.

Key words: choice experiment, consumer behavior, consumer ethnocentrism, CETSCALE, product origin

Introduction

Labeling food and drink products with their origins is a common and important marketing mechanism for producers. It is possible to indicate the product origin at almost every geographical level, from countries (e.g., Greek yogurt, Irish whiskey, Spanish paprika) and regions (e.g., Champagne, Cumberland sausage, Tyrolean grey cheese) to cities (e.g., Kobe beef, Gouda cheese, Parma ham, Yongfeng chili sauce). Generally, consumers have positive preferences for labels indicating the specific regional or national origin of food products (Deselnicu et al., 2013; Newman et al., 2014). While ambiguous in terminology, the local food label is also viable as a marketing mechanism to producers (Feldmann and Hamm, 2015).

In the United States, there exist several examples of food and drink products with distinct connections to states, such as Alaska salmon, Florida orange juice, Idaho potatoes, Tennessee whiskey, and Wisconsin cheese. In addition to trademarks of such place–product combinations, all 50 states have over time also developed state-sponsored designations (SSD) (Onken and Bernard, 2010). While qualifications differ by state, producers may generally use SSDs if they operate within the state. Like most labels of product origin, consumers in general have a positive attitude toward SSDs, such as PA Preferred (James, Rickard, and Rossman, 2009), Utah's Own (Barnes et al., 2014), and Kentucky Proud (Soley, Hu, and Vassalos, 2019).

This study focuses on the Missouri Grown label, an SSD that received academic attention from Brown (2003) when the program still existed under its original name of AgriMissouri. At the time, 64% of sampled consumers in the Southeast region of the state reported having no awareness of AgriMissouri, yet 79% expressed a general interest in the label as an indication of "local" product origin. At the same time, however, only 12% of the consumers considered food and drink products with a Missouri product origin label to be local. Since Brown (2003), little research has been

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conducted on Missouri's SSD. Aguilar et al. (2010) and Osburn, Holcomb, and Neill (2020) elicited consumer preferences for chestnuts and milk, respectively, from Missouri, but these studies did not specifically use or reference the Missouri Grown label. It is therefore unknown whether, or why, Missouri consumers have a positive attitude toward the Missouri Grown label, which is of importance to Missouri farm producers who seek to improve performance.

A possible explanation for product origin preferences is consumer ethnocentrism (Shimp and Sharma, 1987), an economic interpretation of a sociopsychological concept that concerns the tendency of consumers to favor in-group rather than out-group products and services. Often based on such characteristics as age, income, or religion, the in-group is a social group with which an individual identifies herself psychologically. By contrast, the out-group is composed of individuals who do not share the same demographic or psychographic characteristics. Consumer ethnocentrism is often measured with the Consumer Ethnocentric Tendencies Scale (CETSCALE) (Shimp and Sharma, 1987), which is also useful to explain food consumer behavior (e.g., Orth and Firbasová, 2003). Consumer ethnocentrism is most often applied at the national level (e.g., Kilders, Caputo, and Liverpool-Tasie, 2021), but applications at the subnational level are increasingly common (e.g., Fernández-Ferrín et al., 2020), including state-level analyses in the United States (Johnston et al., 2018; Osburn, Holcomb, and Neill, 2020).

We address the gap in the literature by exploring preferences for the Missouri Grown label in terms of ethnocentrism while controlling for other important product and process attributes (i.e., lean ratio, production system, price). To do so, we recruited 249 ground beef consumers from Missouri to participate in a choice experiment and take a modified CETSCALE. We find evidence of a significant willingness-to-pay (WTP) for the Missouri Grown label. At the mean, the price premium is estimated to be \$0.42/lb. However, there is significant heterogeneity in the WTP for the Missouri Grown label, which is in part explained by consumer ethnocentrism. For each one-unit increase in the average rating of the CETSCALE (1–7 scale), the price premium for the Missouri Grown label increases by \$0.15/lb. We contribute to the state-level food origin literature with behavioral explanations for consumer preferences. These novel findings have important implications for academics, practitioners, and legislators.

Literature Review

We review the empirical literature on consumer preferences for food and drink products with state-level origin labeling. To be clear, we do not review the literature on local food, which has complex and ambiguous dimensions in terms of geography and food product and process characteristics (Low et al., 2015). There is no evidence in the prior literature that suggests food consumers perceive local and state-level labels to be the same (e.g., Brown, 2003; Onken, Bernard, and Pesek, 2011; Carroll, Bernard, and Pesek, 2013). Therefore, we review studies in which (i) the state is indicated by name only, (ii) the state is indicated with a fictitious label, and (iii) the state is indicated by an SSD. Because the Missouri Grown label is the focus of this study, the review is restricted to the 50 states in the United States to avoid confusion with regions, countries, or other geographical bodies.

A common approach to the estimation of consumer preferences for SSDs is to include a binary attribute with no indication of the product origin as the base category. For example, Merritt et al. (2018) measured a WTP of \$1.15/lb to \$1.53/lb for ground beef and \$2.42/lb to \$2.89/lb for steak labeled as Tennessee Certified Beef, a fictitious label (see Table 1). With shrimp as the product of interest, Soley, Hu, and Vassalos (2019) observed WTPs of \$3.81/lb and \$2.93/lb in Kentucky and South Carolina, respectively. With Arizona Grown as the SSD, Nganje, Hughner, and Lee (2011) measured a WTP of \$0.10/lb for carrots and \$0.18/lb for spinach. Osburn, Holcomb, and Neill (2020) calculated own and cross-state WTP estimates for milk from eight states.

Another common approach is to include multiple credence attributes to determine if the product origin label is viable in the presence of other labels. For example, Fonner and Sylvia (2015) included not only the product origin label (i.e., Oregon) but also food safety, sustainable production, and

Table 1. Overview of WTP Estimates for Food and Drink Products with State-Level Product Origin Labeling

Author(s)	State	SSD	Product	WTP
Barnes et al. (2014)	Utah	Utah's Own	Cheese (lb)	\$0.17–\$0.33
Carpio and Isengildina-Massa (2009)	South Carolina	SC Grown	Produce Meat	27.5% 23%
Chakrabarti, Campbell, and Shonkwiler (2019)	Connecticut	No	Mushrooms (8 oz)	\$1.86
Curtis, Gumirakiza, and Bosworth (2014)	Utah	No	Peppers (lb) Cucumbers (lb) Yellow squash (lb)	\$4.00 \$2.21 \$2.25
Fonner and Sylvia (2015)	Oregon	No	Chinook salmon (lb) Dungeness crab (lb)	\$3.15 \$1.91
Hu et al. (2009)	Kentucky	No	Blueberry jam (10 oz)	\$1.46
James, Rickard, and Rossman (2009)	Pennsylvania	PA Preferred	Applesauce	12%–42%
Loureiro and Hine (2002)	Colorado	Colorado Grown	Potatoes (lb)	\$0.09
Merritt et al. (2018)	Tennessee	No	Ground beef (lb) Steak (lb)	\$1.15–\$1.53 \$2.42–\$2.89
Nganje, Hughner, and Lee (2011)	Arizona	Arizona Grown	Carrots (lb) Spinach (lb)	\$0.10 \$0.18
Onken, Bernard, and Pesek (2011)	Delaware Maryland New Jersey Pennsylvania Virginia	Grown Fresh Maryland's Best Jersey Fresh PA Preferred Virginia's Finest	Strawberry jam (18 oz)	\$0.90–\$1.33 \$0.63–\$0.93 \$0.07–\$1.39 \$0.72–\$1.06 \$0.73–\$1.08
Osburn, Holcomb, and Neill (2020)	Arkansas Colorado Kansas Louisiana Missouri New Mexico Oklahoma Texas	No	Milk (gallon)	\$4.74 \$2.73 \$5.29 \$3.61 \$4.70 \$5.31 \$6.18 \$3.17
Soley, Hu, and Vassalos (2019)	Kentucky South Carolina	Kentucky Proud Certified South Carolina	Shrimp (lb)	\$3.81 \$2.93

premium quality certifications. The product origin label and the food safety certification captured the highest WTP from consumers. According to Loureiro and Hine (2002), potatoes labeled as being from Colorado received a price premium of \$0.09/lb from consumers, significantly more than the organic label or the GMO-free label. Using a branded design, Barnes et al. (2014) concluded that Utah's Own only yielded a significant price premium for cheese from a relatively unknown brand, illustrating that SSDs may not work well in case of strong brand equity. Onken, Bernard, and Pesek (2011) studied how five SSDs performed in relation to both "local" and "nonlocal" product origin indications. In all but one case (i.e., Jersey Fresh), the "local" label received a higher WTP than the SSD.

Consumer preferences for SSDs are not only contingent on other product attributes but also on consumer characteristics, which are at times indicated by means of class analysis. For example, while noting a positive WTP for the Preferred PA label across the full sample, James, Rickard, and Rossman (2009) observed the highest WTP among consumers who frequently bought local and organic food yet had relatively limited knowledge of agriculture. In the context of Medjool dates, Peschel et al. (2019) observed only two classes of respondents (22% and 9% of the total sample) with a positive WTP for Arizona or California as the product origin. Similarly, only one of three classes (37% of the total sample) expressed a significant WTP for mushrooms from Connecticut (Chakrabarti, Campbell, and Shonkwiler, 2019). The latter two studies in particular illustrate how large segments of the population may not have positive preferences for SSDs.

According to the reviewed publications, consumers in general have a positive WTP for both actual and fictional SSDs. However, one common shortcoming of the studies is the lack of exploration for underlying motivations. Apart from standard demographic characteristics such as age, gender, and income, it is unclear why consumers would exhibit positive WTP for SSDs. Put differently, there is no empirical evidence of psychographic characteristics that explain consumer preferences for SSDs. This study addresses the gap.

Experimental Design

Most food products have too many characteristics to include in a choice experiment design. While the experimental design is normally at the discretion of the researcher, it is important to include the most relevant attributes to facilitate unbiased estimation of the consumer preferences. Ground beef is selected as the product of interest because of the lack of branding, which would otherwise facilitate biased estimates in common choice designs (e.g., Ubilava et al., 2011; Grashuis, 2021). Here, we in part follow Henchion, McCarthy, and Resconi (2017), who observed how product origin and production system ranked first and third, respectively, in terms of the importance of credence attributes to beef consumers. Considering the foregoing, the choice experiment design is defined by the following four product attributes:

- **Missouri Grown**. There are two levels: (i) no and (ii) yes.
- **Grass-fed**. Whether the main nutritional source of the cattle is grass is captured by two levels: (i) no and (ii) yes. Using the experimental auction method, both Umberger et al. (2002) and Xue et al. (2010) observed a positive WTP for grass-fed beef. In a review of the related literature on consumer preferences for pasture-raised beef, Stampa, Schipmann-Schwarze, and Hamm (2020) concluded that there exist various segments of consumers who are willing to pay a price premium.
- **Lean point**. We consider five lean points, which indicate the proportion of lean meat to fat: (i) 73% lean, 27% fat, (ii) 80% lean, 20% fat, (iii) 85% lean, 15% fat, (iv) 90% lean, 10% fat, and (v) 96% lean, 4% fat. In choice experiments with ground beef products, only Lusk and Parker (2009) included the lean point as an attribute. However, their design only included two fat percentages (i.e., 10%, 20%). Because leaner beef is healthier, we expect a positive WTP.
- **Price**. Based on local market research at the time of the study, we include five price levels: (i) \$3.49/lb, (ii) \$3.99/lb, (iii) \$4.49/lb, (vi) \$4.99/lb, and (v) \$5.49/lb. Price is expected to have a negative impact on consumer preferences.

Based on the attributes and their levels, the total number of unique product profiles is $2 \times 2 \times 5 \times 5 = 100$. Following Kuhfeld (2010), we first compose a fractional factorial design with 80 of the 100 unique product profiles. Using a conventional setup with two product profiles per choice set, the total number of choice sets is $80/2 = 40$. We then construct five blocks of eight choice sets to ensure each level in the choice experiment design is included at similar frequencies while limiting respondent fatigue. The D-efficiency of the choice design was 98.17.

Table 2. Example of a Choice Scenario

Attribute	Product 1	Product 2
Lean point	96%	90%
Grass-fed	No	No
Missouri Grown	No	Yes
Price	$4.49/lb	$4.99/lb
Which of the above products do you choose?		
Product 1		
Product 2		
Neither		

Experiment and Survey Procedure

We recruited 249 respondents on Amazon's Mechanical Turk (MTurk), an online platform where surveyors and respondents meet remotely.[1] The sample size was in part determined by industry guidelines (Orme, 1998; Kuhfeld, 2010) and past choice experiments with ground beef products (Lusk and Parker, 2009; Merritt et al., 2018). MTurk is widely considered to be a viable alternative to more traditional sampling procedures (Berinsky, Huber, and Lenz, 2012; Hauser and Schwarz, 2016; Kees et al., 2017), particularly during the COVID-19 pandemic (Grashuis, Skevas, and Segovia, 2020). To participate in the experiment, respondents needed to be (i) 18 years of age or older, (ii) residents of Missouri, (iii) primary grocery shoppers in their household, and (iv) ground beef consumers.

The experiment opened with a cheap talk script to encourage honest responses. Cheap talk scripts have proven to be effective at limiting hypothetical bias when using the contingent valuation method (Silva et al., 2011; Penn and Hu, 2018). After giving instructions on how to read and answer choice scenarios (see Table 2 for an example), we then randomly assigned respondents to one of five blocks. Altogether, the respondents stated preferences for 16 ground beef product profiles (and eight opt-out options) in eight choice scenarios. The total number of observations per respondent is thus $3 \times 8 = 24$, and the total number of observations for the full sample is therefore $249 \times 3 \times 8 = 5{,}976$. Each block also contained an extra choice scenario as an attention check. Respondents who failed the attention check were excluded from the analysis. Following the choice experiment, we administered the modified 10-item CETSCALE (Shimp and Sharma, 1987). Finally, we elicited demographic characteristics.

Empirical Model

Consumer behavior in conjoint analysis is analyzed on the basis of random utility theory (Lancaster, 1966). We follow the recent choice experiment literature and estimate a WTP-space random utility model in which WTP is captured directly in the utility function (e.g., Segovia and Palma, 2021). Following Train (2016), the utility derived by individual i when choosing product profile j in choice situation t is given by

$$U_{ijt} = -\gamma_i' p_{ijt} + (\gamma_i \boldsymbol{WTP}_i)' \boldsymbol{x}_{ijt} + \varepsilon_{ijt}, \tag{1}$$

where p_{ijt} represents the price of product profile j in choice scenario t, $\boldsymbol{x}_{ijt}$ is a vector of product attributes for individual i in choice scenario t, and $\boldsymbol{WTP}_i$ is a vector of WTP for each nonprice attribute (i.e., lean point, grass-fed, Missouri Grown) in the choice experiment design. The random

[1] University of Missouri IRB Project Number 2051783.

scalar γ_i is positive and equals θ_i/k_i, where θ_i represents the price coefficient in preference space and k_i the scale parameter for individual i. The probability of individual i choosing profile j rather than product profile m in choice scenario t becomes

$$Q_{ilt}(\boldsymbol{\beta}_i) = \frac{e^{-\gamma_i(p_{ijt}+WTP_i' x_{ijt})}}{\sum_{j\in J} e^{-\gamma_i(p_{imt}+WTP_i' x_{imt})}}, \tag{2}$$

where $\boldsymbol{\beta}_i$ is the vector of $\gamma_i \boldsymbol{WTP}_i$. Using WTP notation, the basic model is then specified as

$$\begin{aligned} Q_{ilt}(\beta_i) = {} & \beta_1 80\%Lean + \beta_2 85\%Lean + \beta_3 90\%Lean + \beta_4 96\%Lean \\ & + \beta_5 GrassFed + \beta_6 MissouriGrown + \beta_7 OptOut + \beta_8 Price. \end{aligned} \tag{3}$$

To explore heterogeneity in WTP for the Missouri Grown label in terms of consumer ethnocentricity, an extended model with an interaction term between the Missouri Grown label and the CETSCALE is denoted as

$$\begin{aligned} Q_{ilt}(\beta_i) = {} & \beta_1 80\%Lean + \beta_2 85\%Lean + \beta_3 90\%Lean + \beta_4 96\%Lean \\ & + \beta_5 GrassFed + \beta_6 MissouriGrown + \beta_7 MissouriGrown \times CETSCALE \\ & + \beta_8 OptOut + \beta_9 Price, \end{aligned} \tag{4}$$

where β_6 indicates the estimated WTP for the Missouri Grown label for respondents with a minimum CETSCALE rating and β_7 indicates the marginal effect of the CETSCALE rating on the WTP for the Missouri Grown label. The price coefficients β_8 and β_9 are assumed to have log-normal distributions. Following Hole (2007, p. 395), the formulas for the transformation of log-normal price coefficients to level price coefficients are $\exp\left(\beta_{price} + s^2_{price}/2\right)$ for the mean and $\exp\left(\beta_{price} + s^2_{price}/2\right) \times \sqrt{\exp\left(s^2_{price}\right) - 1}$ for the standard deviation. The associated log-likelihood function is estimated by means of maximum simulated likelihood using the *mixlogitwtp* command in Stata 17 (Hole, 2007).

Results and Discussion

First, Table 3 reports the summary statistics for respondents' demographic characteristics: 63% of respondents were female, which is not surprising as we targeted consumers who were the primary grocery shoppers in their households. Our respondents had an average age of almost 38 and an average income of approximately $59,000. Also, 52% reported possessing a four-year or advanced college degree, and 61% claimed to be employed. Most respondents (81%) were Caucasian. In comparison to the overall adult population in Missouri, the sample is somewhat overrepresented by young, female, (highly) educated, and non-Caucasian individuals. Because of our inclusion criteria (i.e., 18 years of age, primary grocery shopper, ground beef consumer), our target population may not necessarily be the same as the overall population. We are therefore not too concerned with representativeness.

CETSCALE

Table 4 reports the summary statistics for the ten items in the CETSCALE. We measured each item with a seven-point Likert statement, where 1 corresponded to "entirely disagree" and 7 to "entirely agree." Higher ratings indicate a higher degree of consumer ethnocentrism. The statement "It may cost me in the long run but I prefer to support Missouri-made products" received the highest rating on average (4.09), and the statement "Missourians who buy products made in other

Table 3. Summary Statistics of Demographic Characteristics of Study Participants

Variable	Mean	Median	S.D.	Missouri
Female	0.59	1	0.49	0.53
Age	37.55	35	11.73	49.21
Education				
Less than high school	0.01	0	0.11	0.08
High school degree	0.27	0	0.44	0.51
2-year college degree	0.13	0	0.34	0.11
4-year college degree	0.41	0	0.49	0.2
Advanced college degree	0.17	0	0.38	0.1
Employment Status				
Full-time employed	0.82	1	0.38	0.61
Unemployed	0.08	0	0.27	0.03
Retired	0.04	0	0.19	0.19
Other	0.06	0	0.24	0.16
Income ($1,000)	3.19	1	2.78	55.46
Ethnicity				
Caucasian	0.75	1	0.43	0.88
African American	0.12	0	0.33	0.08
Other	0.12	0	0.33	0.04

Table 4. Ratings of the 10-Item CETSCALE

Statement	Mean	S.D.
1. Only products that are unavailable in Missouri should be imported.	3.81	1.88
2. Missouri products first, last, and foremost.	3.93	1.71
3. Purchasing non-Missouri-made products is not Missourian.	2.93	1.91
4. It is not right to purchase non-Missouri-made products, because Missourians will lose jobs.	3.02	1.8
5. A real Missourian should always buy Missouri-made products.	3.06	1.85
6. We should purchase products made in Missouri instead of letting other states get rich.	3.69	1.72
7. Missourians should not buy non-Missouri-made products or it will hurt the economy.	2.96	1.68
8. It may cost me in the long run but I prefer to support Missouri-made products.	4.09	1.62
9. We should buy from other states only those products that we cannot make ourselves.	3.77	1.78
10. Missourians who buy products made in other states are responsible for unemploying fellow Missourians.	2.79	1.78

states are responsible for making fellow Missourians unemployed" received the lowest rating on average (2.79). As the CETSCALE facilitates a single factor on which all 10 items load significantly in the United States (e.g., Shimp and Sharma, 1987), we derive a single indicator of consumer ethnocentrism by taking the average of the 10 ratings. Figure 1 illustrates the distribution of the average rating. Clearly, the distribution is skewed to the left, indicating a relatively large proportion of respondents with a relatively low degree of consumer ethnocentrism, which corresponds to observations by Osburn, Holcomb, and Neill (2020) in the context of state-level preferences among US milk consumers.

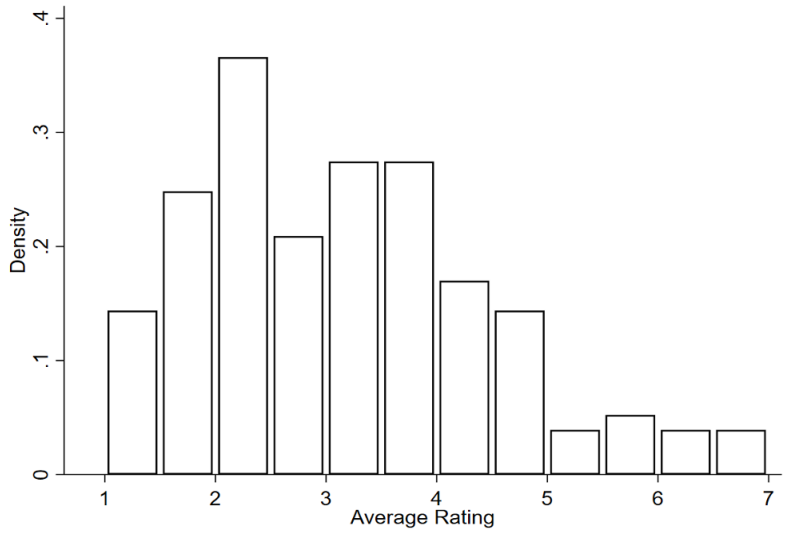

Figure 1. Distribution of the Average Rating of the CETSCALE

Consumer Preferences for the Missouri Grown Label

Table 5 reports the estimates for the model based on equation (3). Because the model is estimated in WTP space, not preference space, the reported estimates are already expressed in $/lb as opposed to part-worth utilities. The model in the left column is the base model (Model 1). Our variable of interest, the Missouri Grown label, is associated with a significant WTP of approximately $0.42/lb at the mean. The estimate is substantially lower in comparison to the $1.15/lb to $1.53/lb price premium estimated for ground beef using the fictitious Tennessee Certified Beef label (Merritt et al., 2018). One possible explanation is the exclusion of fat percentage as a product attribute in the choice experiment design of Merritt et al. (2018),[2] which may have facilitated an upward bias in the estimate for the SSD. The standard deviation for the Missouri Grown label is also statistically significant, which indicates heterogeneity in the WTP estimate across the sample.

Based on equation (4), the model in the right column includes an interaction term between the Missouri Grown label and the average rating of the CETSCALE (Model 2). The interaction term indicates whether the WTP for the Missouri Grown label varies according to the average rating of the CETSCALE. Per the estimates, consumer ethnocentrism is able to explain the heterogeneity in WTP for the Missouri Grown label observed in Model 1. The level term of the Missouri Grown label, which concerns the estimated effect when the average rating of the CETSCALE is at its minimum of one, is no longer statistically significant. Instead, the WTP for the Missouri Grown label is explained by the interaction term, which is associated with an estimated WTP of $0.15/lb. As such, when the average rating of the CETSCALE increases by one unit or one point, WTP increases by $0.15/lb. With everything else held constant, consumers with a maximum rating of 7 are willing to pay $0.90/lb ($0.15/lb $\times$ 6) more for ground beef with the Missouri Grown label than consumers with a minimum rating of 1. Of course, as discussed in the prior section, relatively few consumers have a maximum rating of 7. When considering the median CETSCALE rating of 3, we see a WTP of $0.30/lb ($0.15/lb $\times$ 2) compared to the base level. The effect of $0.30/lb estimated at the median in Model 2 is comparable in magnitude to the effect of $0.42/lb estimated at the mean in Model 1.

[2] Merritt et al. (2018) used 85% lean ground beef as the product of interest.

Table 5. Results of Mixed Logit in WTP-Space Models

Mean	Model 1	Model 2	Model 3
80% Lean	1.220*** (0.144)	1.153*** (0.124)	1.208*** (0.14)
85% Lean	1.080*** (0.116)	1.171*** (0.121)	1.219*** (0.131)
90% Lean	1.506*** (0.139)	1.54*** (0.141)	1.574*** (0.148)
96% Lean	1.261*** (0.131)	1.212*** (0.17)	1.208*** (0.138)
Grass-Fed	0.624*** (0.076)	0.657*** (0.083)	0.574*** (0.094)
Missouri Grown	0.421*** (0.058)	0.079 (0.136)	0.291*** (0.108)
MG × CETSCALE		0.148*** (0.049)	
MG × CETSCALE (Group2)			−0.046 (0.148)
MG × CETSCALE (Group3)			0.436** (0.187)
MG × CETSCALE (Group4)			0.637** (0.251)
Opt Out	−8.154*** (0.606)	−8.227*** (0.674)	−7.79 (0.602)
Price	−0.783*** (0.061)	−0.764*** (0.061)	0.764*** (0.061)
S.D.			
80% Lean	−0.110 (0.177)	−0.171 (0.162)	−0.630*** (0.191)
85% Lean	−0.100 (0.082)	−0.053 (0.141)	0.174 (0.107)
90% Lean	−0.602*** (0.204)	−0.527*** (0.115)	0.337 (0.193)
96% Lean	1.355*** (0.149)	1.203*** (0.146)	0.963*** (0.144)
Grass-Fed	−0.289 (0.169)	0.494*** (0.134)	−0.759*** (0.13)
Missouri Grown	0.302*** (0.087)	−0.112 (0.127)	0.016 (0.087)
MG × CETSCALE		0.059 (0.042)	
MG × CETSCALE (Group2)			−0.391** (0.154)
MG × CETSCALE (Group3)			−0.207 (0.161)
MG × CETSCALE (Group4)			−0.904*** (0.246)
Opt Out	−4.216*** (0.456)	−3.22*** (0.381)	−3.014*** (0.405)
Price	0.114*** (0.041)	0.156*** (0.042)	0.142*** (0.046)

Notes: ***, **, and * denote statistical significance at p=0.01, p=0.05, and p=0.10, respectively.

Model 3 offers an alternative look at heterogeneity in WTP for the Missouri Grown label. Instead of the level term of the CETSCALE rating, the Missouri Grown label is interacted with four groups on the basis of the three quartiles of the CETSCALE ($q_1 = 2.20$, $q_2 = 3.20$, $q_3 = 4.50$). The objective here is to determine if there exist differences in the WTP for the Missouri Grown label across the four groups with varying degrees of consumer ethnocentrism. In this case, the level term indicates the effect of the Missouri Grown label on WTP for the first group ($0.29/lb). The estimated WTP for consumers in the second group is not significantly different, which implies the lower half of the sample in terms of consumer ethnocentrism has the same WTP for the Missouri Grown label. In comparison to the first group, the third group and the fourth group have a significant WTP of $0.44/lb and $0.64/lb, respectively. According to a Wald test, however, the two coefficients are not significantly different ($X^2 = 0.54$, $p = 0.464$). As such, Model 3 suggests that the relationship of consumer ethnocentrism to the WTP for the Missouri Grown label is a tale of two halves, with a point estimate of approximately $0.29/lb for the bottom half and a range of $0.44/lb to $0.64/lb for the upper half.

The above results in general relate to several literatures. To begin, we inform consumer preferences for ground beef (Lusk and Parker, 2009; Merritt et al., 2018), which is often overshadowed by beef steak in the literature. We produce more evidence of consumer preferences for fat percentages (Lusk and Parker, 2009) as well as state-level labels (Merritt et al., 2018). We also inform consumer preferences for SSDs in general (e.g., Soley, Hu, and Vassalos, 2019) and the Missouri Grown label in particular (Brown, 2003), which is important for Missouri beef producers who have interest in marketing beef across the state. The viability of the Missouri Grown label

in the context of ground beef is motivational for producers of other food products with local and regional applications in Missouri. According to the prior literature, SSDs are also compatible with applesauce (James, Rickard, and Rossman, 2009), cheese (Barnes et al., 2014), strawberry jam (Onken, Bernard, and Pesek, 2011), fruits and vegetables (Carpio and Isengildina-Massa, 2009; Nganje, Hughner, and Lee, 2011), and other food products grown in Missouri. From a broader perspective, we extend the literature on consumer ethnocentrism at the subnational level (Fernández-Ferrín et al., 2020), confirming how consumer preferences for local and regional environments follow in-group preferences. Finally, we also extend the recent literature on the relationship of consumer ethnocentrism to SSDs (Johnston et al., 2018; Osburn, Holcomb, and Neill, 2020). Consumer ethnocentrism is likely an important driver behind the success (or the lack thereof) of SSDs, perhaps even serving as a necessary condition to consumer WTP.

Consumer Preferences for Lean Ratio and Grass-Fed Attributes

The estimates for the lean ratio attribute for the most part conform to our expectations. Upon inspection of the results of Model 2, respondents have a positive WTP for any level in comparison to the 73% lean, 27% fat level. The relationship of the lean ratio to utility is not linear, however, as the 90% lean, 10% fat level is the most preferred ($1.54/lb). The leanest option (i.e., 96% lean, 4% fat) is associated with a price premium of $1.21/lb. Our result is explained in part by Schulz, Schroeder, and Xia (2012), who used scanner data to study revenue and market share on the basis of brands and lean ratios. According to their results, the 96%–100% lean product category is a niche market, having only 3% of the total revenue in the ground beef sector. Our result complements prior research by Lusk and Parker (2009), who also conducted a choice experiment with ground beef products and observed a negative WTP for increases in fat percentage. However, Lusk and Parker (2009) only included two levels (i.e., 80% lean, 90% lean) and thus failed to cover the wider range of lean ratios available in the marketplace.

Also consistent with prior findings is our positive estimate for the grass-fed attribute. At the mean, the WTP for the grass-fed label is $0.66/lb in Model 2 and $0.57/lb in Model 3. We thus corroborate the research of Umberger et al. (2002), Kerth et al. (2007), and Xue et al. (2010), who all found segments of consumers who have positive preferences for grass-fed or forage-finished beef. Our ability to compare estimates is limited as the grass-fed attribute is either equated with the foreign origin attribute (Umberger et al., 2002) or applied to beef steak as opposed to ground beef (Kerth et al., 2007; Xue et al., 2010). Other studies with observations of consumer preferences for the grass-fed attribute came without WTP estimates (e.g., Realini et al., 2013). Regardless, the presence of a WTP is useful information for grass-fed beef producers, who are generally still operating in a niche market (Gillespie et al., 2016).

Conclusion

From countries to cities, consumer behavior is in part based on where products are grown or processed. In support of local producers, all states in the United States have developed an SSD, with varying degrees of success. In this study, we explored consumer preferences for the Missouri Grown label, which has received scant attention in the academic literature. We conducted a choice experiment with 249 ground beef consumers to estimate WTP for the Missouri Grown label while considering other important product and process attributes (i.e., lean ratio, production method, price) as well. Further, we explained consumer preferences for the Missouri Grown label from the perspective of consumer ethnocentrism, a sociopsychological concept with an economic interpretation. The Missouri Grown label is associated with a price premium at the mean, but there is significant heterogeneity across the WTP distribution. Generally, consumers who consider products and services from Missouri to conform with in-group preferences have a significantly higher WTP for the Missouri Grown label.

Our findings have several implications for practitioners and legislators. First, there is obvious motivation for Missouri beef producers to use the Missouri Grown label as part of their in-state marketing strategies. If able to market across the state, Missouri beef producers may capture a price premium of up to $0.90/lb depending on the degree of consumer ethnocentrism. Second, in order to capture the upper range of the price premium, Missouri beef producers ought to target consumers with a high degree of ethnocentrism in relation to the state of Missouri. While direct marketing is often employed by beef producers, especially in case of niche markets such as grass-fed, there may exist opportunities to use other channels with local and regional orientations. Third, state legislators may expand funding for the Missouri Grown program in support of Missouri producers in general. With improved consumer recognition and awareness, the Missouri Grown label may provide greater opportunities for Missouri producers to compete with producers from other states and other countries who sell products and services in the state. Fourth, for program operators and state-level producers, it may prove useful to measure and analyze the demographic and psychographic characteristics of Missouri consumers across the ethnocentrism distribution. Missouri consumers with low or high degrees of ethnocentrism may have common characteristics in terms of age, income, risk perception, price responsiveness, or political affiliation, thus facilitating opportunities to engage in market segmentation. There is motivation to explore opportunities to improve state-level ethnocentrism among Missouri consumers. Then, if geographic origin is an important product or process attribute, Missouri consumers are potentially more likely to support Missouri producers. The potential impact of state-level ethnocentrism is not necessarily limited to the food industry nor to the state of Missouri.

Weaknesses and limitations of our study in part inform future research directions. First, increasingly more choice experiments use framing to consider the impact of information or some other variable on consumer behavior. Providing information to consumers in terms of the history of the Missouri Grown label may create stronger preferences. Second, beef is merely one of many food and drink products grown or processed in the state of Missouri. Consumer preferences for the Missouri Grown label may vary across product categories for any number of reasons. Future research may expand the scope from beef to milk, honey, chicken, and other food and drink products. Third, consumer preferences for the Missouri Grown label only present one side of the equation. Information on producer preferences for the Missouri Grown label is necessary to inform common challenges and opportunities in terms of market access, quality, finance, and more.

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