Preferences for local food: Tourists versus local residents

Tongzhe Li
Department of Food, Agricultural and Resource Economics, University of Guelph
50 Stone Rd E., Guelph, Ontario N1G 2W1, Canada
Tel: 519-824-4120 ext 53332; Email: tongzhe@uoguelph.ca

Kent D. Messer
Department of Applied Economics and Statistics, University of Delaware
531 S. College Avenue, Newark, Delaware 19716, USA
Tel: 302-831-1316; Email: messer@udel.edu

Alisher Mamadzhanov
United Nations Economic Commission for Europe
Palais des Nations, 8-14 Avenue de la Paix, CH-1211 Geneva 10, Switzerland
Tel: + 41 22 917-24-42; Email: alisher.mamadzhanov@un.org

Jill J. McCluskey
School of Economic Sciences, Washington State University
PO Box 646210, Pullman, Washington 99164-6210, USA
Tel: 509-335-2835; Email: mccluskey@wsu.edu

Abstract: This study examines preferences for local foods by two distinct consumer groups: local residents and tourists. In an incentive-compatible framed field experiment, a series of dichotomous-choice tasks involving oyster purchases were completed by 758 individuals: 341 local residents recruited at a Division of Motor Vehicles office and 417 tourists recruited at a beach ferry terminal. The experimental design allowed us to investigate differences in preferences between tourists and local residents for locally produced oysters. Our estimates suggest both locals and tourists are willing to pay more for local oysters than for non-local ones, though this result is only statistically significant among tourists. The findings from this study shed light on potential designs for labels of food products, particularly when marketed in popular tourism areas.

Résumé: Cette étude examine les préférences pour les aliments locaux de deux groupes de consommateurs distincts: les résidents locaux et les touristes. Dans le cadre d'une expérience terrain qui incite la révélation des valeurs, une série de tâches à choix dichotomique impliquant l'achat d'huîtres ont été effectuées par 758 personnes: 341 résidents locaux

This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/cjag.12261.

recrutés dans un bureau de la Division des véhicules automobiles et 417 touristes recrutés sur une plage servant de terminal de traversiers. Le design expérimental nous a permis d'étudier les différences de préférences entre les touristes et les résidents locaux pour les huîtres produites localement. Nos estimations suggèrent que les habitants et les touristes sont prêts à payer plus pour les huîtres locales que pour les huîtres non locales, bien que ce résultat ne soit statistiquement significatif que parmi les touristes. Les résultats de cette étude mettent en lumière les conceptions potentielles d'étiquettes de produits alimentaires, en particulier lorsqu'ils sont commercialisés dans des zones touristiques populaires.

Acknowledgements: This research was funded by the National Oceanic and Atmospheric Administration Sea Grant, National Science Foundation EPSCoR, and the Center for Behavioral and Experimental Agri-Environmental Research. The authors thank Ana Espinola, Alan Love, Ron Mittelhammer and participants at the 2019 Canadian Agricultural Economics Society's annual meeting for helpful comments, thank James Geisler, Julia Parker, Francesca Piccone, Kaitlynn Ritchie, Maddi Valinski, Shang Wu, and Huidong Xu for their assistance in computer programming and administering the experiment. The views expressed herein are those of the authors and do not necessarily reflect the views of the United Nations. Any remaining errors are the responsibility of the authors.

Keywords: Local food; Local residents; Tourists; Field experiment; Oysters

JEL codes: D12, L15, O13, Q55

Introduction

Consumers' preferences for locally produced foods have been growing throughout the past two decades (Adams & Salois, 2010) and are particularly evident in the increase in community-supported agriculture organizations and farmers' markets (Thilmany et al., 2008). There is a growing literature on consumer preferences for local food (e.g., Soley et al., 2019; Lim & Hu, 2015). Among the many reasons consumers prefer local products are the resulting support of local producers (Zepeda & Leviten-Reid, 2004), creation of local jobs (Cooke & Watson, 2011), and quality and freshness considerations (Ahearn & Sterns, 2013).

An interesting follow-up question is whether some groups of consumers have a stronger preference for local foods. Consider, for example, popular tourism destinations where residents and visitors may have different motives for being interested in local foods

and where tourist spending is a major contributor to the local economy. Quantifying residents' and tourists' willingness to pay (WTP) for local foods can provide important information for producers and marketers and show whether tourists generally are as willing to pay a premium for foods produced in the areas in which they travel as residents are.[1]

In a trade study, Armington (1969) first proposed that home and foreign goods were differentiated based purely on the origin of their production and that consumers favored goods produced in their home countries. Morey (2016) recently verified that consumers place greater value on items produced in their own country when origin was the only tangible difference in the products. Numerous studies have shown that consumers are often willing to pay a premium for fresh food products produced within the region in which they live (Peterson et al., 2015; Grebitus et al., 2013; Toler et al., 2009; Jekanowski et al., 2000). However, little is known about how those preferences apply when consumers travel to other areas of the country. Studies have shown that a large share of the motivation for paying a premium for locally produced food is related to support for the local economy and its producers (e.g., Zepeda & Leviten-Reid, 2004). Such motivations may not necessarily apply to tourists, but travelers may have other motives for preferring locally produced foods, such as experiencing the local culture or tasting local cuisine. This study compares the responses of residents and tourists to opportunities to purchase locally produced oysters to begin to answer these questions.

Tourism generates billions of dollars in revenue annually that goes directly to producers and communities in these areas. Worldwide, annual revenue generated from tourism increased from $0.49 trillion in 1995 to $1.39 trillion in 2016. It doubled in Canada

[1] Some "experience" products, such as Bordeaux wines, Maine and Maritimes lobsters, and Maryland blue crabs, are clearly popular among tourists but other, lesser known products, such as wines from the Midwest of the United States are unattractive to tourists.

and nearly tripled in the United States over the past 20 years, rising from $9.18 billion and $93.74 billion to $18.09 billion and $246.17 billion, respectively (World Bank, 2018). Numerous empirical studies have confirmed that tourism growth has had positive effects on long-term economic performance in various nations (e.g., Fayissa et al., 2008; Balaguer & Cantavella-Jorda, 2002).

Seafood can be a popular attraction for visitors to coastal areas. Consumers' preferences for local seafood products have been attributed to food safety concerns (Wessells & Anderson, 1995), interest in supporting sustainable fisheries (McClenachan et al., 2014), and a willingness to avoid the negative environmental consequences and degrading of food quality associated with transporting seafood products over long distances (McClenachan et al., 2014). Similar to a wine's *terroir*, oysters have their own *merroir*, which means that the taste of an oyster depends on the location where it grew (Shilcutt, 2012). The U.S. produced $1.5 billion worth of aquaculture (farmed) seafood in 2016, among which the top species was oysters ($192 million) (NOAA, 2019).

Moreover, oysters provide a wide range of ecosystem services (Coen et al., 2007) at local and global levels. Therefore, researchers have investigated consumer valuations for a variety of oyster attributes (Li & Messer, 2019; Alfnes et al., 2018). Examples include the nutrient level of the watershed from which they are harvested (Li et al., 2018), growing methods (Kecinski et al., 2017), concerns about human health associated with eating raw oysters (Petrolia et al., 2014), product packaging (Loose et al., 2013), and type of harvest location such as wild-caught versus aquaculture (Chen et al., 2017). Generally, these studies have found that consumers are sensitive to the harvest location of oysters and are willing to pay a premium for locally produced oysters (see Chen et al. (2017) for a choice experiment conducted in Hawaii, and Li et al. (2017) for a field experiment conducted in the U.S. East

Coast). Though oysters are harvested in many areas that attract tourists, little is known about potential differences in the preferences of tourists and local residents. This information is important to efforts by producers and marketers to predict demand, develop marketing strategies for tourism areas, and inform local businesses about opportunities to offer local foods to tourists and residents.

Our study extends the existing literature on preferences for local fresh foods by introducing consumer differentiation associated with tourism. We conducted a framed field experiment involving oyster-purchasing decisions at sites in the U.S. Mid-Atlantic region to estimate WTP for local and non-local foods by two types of subjects: local residents of Delaware and tourists visiting the Delaware coast.[2] "Local residents" were recruited at the Delaware State Division of Motor Vehicles (DMV) and "tourists" were recruited at the ferry terminal in Lewes, Delaware, a popular tourist destination.[3] The two sites are located less than 100 miles apart and are both in Delaware but attract different segments of the population. We compare the two groups' WTP for local and non-local oysters to determine if tourists bring a preference for locally produced fresh foods with them when they travel and how their preferences might vary in magnitude from preferences of local residents.

A single-bounded dichotomous-choice format was used to collect data in this framed field experiment. The 758 adult participants in the experiment made yes/no decisions regarding purchasing local and non-local oysters at stated market prices, and we then used a random-effects logit model to assess whether residents and tourists' WTP for local oysters vary. Our point estimates suggest both locals and tourists are willing to pay more for local

[2] Until 2019, Delaware was the only coastal US state that lacked a commercial aquaculture industry. Given this nascent industry, policymakers and potential oyster farmers are keenly interested in consumer preferences for oysters (Li et al., 2017). In this case, oyster is not an "experience" product that is popular among tourists to that area.

[3] The Delaware tourism industry is the 4th largest private employer in the state, which contributed $3.4 billion to the state's GDP in 2017 (Delaware Tourism Office, 2019).

oysters than for non-local ones, though this result is only statistically significant among tourists.

Conceptual Framework

Suppose that consumers $C \in \{R,T\}$, including both local residents (R) and tourists (T), make consumption decisions for goods endowed with a vector of characteristics: quality, $Q \in [0,1]$, and origin of production as either local or non-local indexed by $O \in \{L, NL\}$. The origin of production affects the taste of the oysters through *merroir* (Shilcutt, 2012). These taste factors (e.g., brininess, sweetness, and size) are horizontal quality attributes, meaning that different consumers prefer different levels. These individuals are presented with a single variety of the good, $X_{Q^C}^{O^C}$, and all other commodities become numeraire goods, Y. Assume that the quality of the good is objective and perfectly observable, and that all individuals value it equally. The utility a consumer derives from consumption of $X_{Q^C}^{O^C}$ is a function of Q and O^C. Let $U\left(X_Q^{O^C}\right)$ be the utility function, which is increasing and concave

$$\partial U\left(X_Q^{O^C}\right)/\partial Q > 0,\ \partial^2 U\left(X_Q^{O^C}\right)/\partial Q^2 < 0. \tag{1}$$

Thus, quality is a vertical quality attribute, meaning that all consumers prefer more quality to less. Consumers maximize $U\left(X_Q^{O^C}, Y\right)$ subject to a budget constraint. The first-order conditions indicate that

$$\frac{\partial U\left(X_Q^{O^R}\right)/\partial X_Q^L}{\partial U\left(X_Q^{O^R}\right)/\partial X_Q^{NL}} = \frac{P_L^R}{P_{NL}^R},\ \frac{\partial U\left(X_Q^{O^T}\right)/\partial X_Q^L}{\partial U\left(X_Q^{O^T}\right)/\partial X_Q^{NL}} = \frac{P_L^T}{P_{NL}^T}. \tag{2}$$

Therefore, the relative prices are determined by the relative marginal utilities consumers derive from local and non-local foods, all else being equal.

We assume that quality is perceived objectively (the same for all consumers) and has a homogeneous effect on the marginal utility of local residents and tourists.[4] We acknowledge that local foods may be correlated with freshness, especially for seafood. However, this assumption holds as long as local residents and tourists both value the freshness associated with lower food miles. We assume that different consumer groups may have heterogeneous preferences for local origin, which affects the oyster's *merroir*. For instance, some local residents have a desire to support their State's economy and consequently are willing to pay a premium for local products. Tourists, on the other hand, may have a relatively strong preference for local products because they are interested in trying new products and experiences while traveling. Thus, the desire to experience local culture and cuisine could be a primary motivator for their interest in purchasing local products.

To estimate residents' and tourists' WTP for a local food, we use the following hedonic model, which is derived from equation 2:

$$P_O^T = \pi\left(O^T, Z_i; \beta^T, Q\right) + \varepsilon_{iT}, \; P_O^R = \pi\left(O^R, Z_i; \beta^R, Q\right) + \varepsilon_{iR} \tag{3}$$

where Z_i, $i \in \{1, \ldots, I\}$, denotes participant i's demographic characteristics and β^T, β^R are unknown parameters to be estimated.

[4] This assumption can be violated if a local product has a well-known reputation, either good or bad, among local communities. For example, as pointed out by a reviewer, there may be regions in France that do not historically produce good wine. Foreign tourists may still think local wine has high quality there because it is grown in France, but many local residents will have different perceptions. However, this assumption holds for food products that do not have a historical reputation tied to a certain region, such as seaweed salad produced in the Canadian Maritimes Local oysters are defined as harvested within 100 miles in our study instead of tied to the state of Delaware. Given that Delaware is a small state surrounded by different watersheds and their local oyster market is nascent (only re-starting in 2018), local residents and tourists likely perceive the quality similarly.

Experimental Design

We conducted a field experiment in two locations in Delaware separated by less than 100 miles, allowing us to use the same products and location labels at both sites. Those sites – a Delaware State DMV office that primarily serves drivers living in the surrounding area and the ferry terminal at Lewes, Delaware, a popular beach that primarily attracts recreational visitors – allowed us to sample fundamentally different populations, one consisting entirely of residents and the other drawing a significant number of people from outside the area.

Identical methods were used to recruit adult participations at the two experiment sites, and individuals who agreed to participate in the study signed a consent form approved by the University of Delaware's Institutional Review Board. The experiment activities were completed on tablet computers using Willow, a python-based program for economic experiments. The experiment took 10 to 15 minutes to complete and participants received $10 in cash compensation that they could keep or use to purchase oysters in the experiment.

We elicited consumers' WTP for local and non-local oysters using a price-based revealed-preference experiment involving single-bounded dichotomous choices in which the participants were offered three opportunities to purchase oysters that had different labels regarding their origin. This method was adopted instead of alternative experimental auctions because this field experiment mimicked a real oyster market where individuals simply decide whether to purchase oysters at a posted price that is exogenously determined. The participants, in response to each type of oyster offered at a stated price, made a yes/no decision regarding whether to purchase them. Each participant was allowed to select the number of oysters they desired (they could choose to buy three, six, nine, or twelve of the oysters) and the preparation method they preferred (served on-site raw on a half shell, served

on-site deep fried, or provided bagged on ice to take home). These choices were provided as suggested by oyster professionals, as they are generally available in seafood markets. The posted prices were generated by random draws from a normal distribution with mean of $1.50 and standard deviation of $0.50 that represented common market prices for oysters at the time of the experiment (see Appendix A for experiment instructions). The price distribution was based on consultations with local oyster experts and represents the common market prices for oysters at the time. There was no significant price difference between local oysters and non-local oysters in Delaware's market.

To maintain incentive-compatibility, the participants were informed prior to the experiment that one of the three purchase decisions that they make on the oysters presented would be randomly selected for implementation at the end of the experiment. Participants who had chosen to purchase that type of oysters paid for them at the posted price using the compensation of $10 provided (and potentially had to contribute some of their own money depending on how many oysters they chose to purchase). Given this design, the dominant strategy is to answer yes and choose to purchase the oysters only if the posted price is lower than or equal to the participants' true WTP for them.

At each site, employees of a professional oyster-shucking service prepared the oysters as requested in an area separate from the experiment to ensure a high quality of presentation of the products and adherence to food safety requirements. Thus, the participants could not see, smell, or taste the oysters they were considering for purchase during the experiment, reducing statistical noise in our elicitation of consumers' preferences. Nevertheless, the service ensured that participants were provided with the right products. Specifically, each participant who answered yes to the binding option received a ticket from the administrator that states the quantity, preparation, type (local, non-local and non-specified; participants who

had the non-specified option binding may have received either the local or non-local type) and price of oysters. The professional shuckers strictly followed the information presented on each ticket.

The labeling treatments provided general information to the participants about the oysters' localness: (1) local, (2) non-local, and (3) no statement about the harvest location. "Local" was defined for participants as oysters harvested within 100 miles of the experiment location[5] and "non-local" was defined as oysters that had been harvested more than 100 miles from the site. To mimic a realistic market, each participant was presented with all three options simultaneously (we observe that stores with a kiosk ordering system commonly group food from the same category into the same page). Furthermore, to control for potential order effects, the software randomly arranged the oyster choices presented to each participant. See Appendix B for a screenshot of the decision-making interface.

We also identified numerous characteristics (e.g., color, smell, meatiness) that affect consumers' preferences for fresh oysters in consultation with local restaurant owners and retailers to create a realistic oyster market in the experiment. After completing the purchase decisions, the participants filled out an on-screen survey that collected information on their demographic characteristics, shopping preferences, and perceptions regarding eight of those oyster attributes: appearance, species, size, saltiness, smell, shell color, meat color, and harvest location.

Following the survey, participants who had chosen to purchase the oysters randomly selected as binding paid for the oysters at the posted price using the $10 compensation (and potentially had to provide additional money depending on how many of the oysters they

[5] Definitions of "local" food have varied widely in prior studies (Hand & Martinez, 2010). They have been based on the food having been produced within a specified distance from the consumer (Darby et al., 2008) or as produced within a local political boundary such as a state (Giraud et al., 2005) or county (Schneider & Francis, 2005).

chose to buy) and received the oysters prepared as they had requested and any money remaining. Participants who had chosen not to purchase those oysters received the full $10 compensation and no oysters.

Model

We use a single-bounded dichotomous-choice model (Venkatachalam, 2004) to analyze the outcomes of the field experiment. Each dichotomous choice leads to one of two outcomes: yes, the participant chooses to purchase the oyster, or no, the participant chooses not to purchase the oyster at the posted price. Thus, a respondent's true WTP can be placed in one of two intervals, $(-\infty, p)$ or $[p, +\infty)$, in which p is the posted price randomly drawn from the market price distribution. The bidding mechanism produces the following discrete outcomes:

$$D = \begin{cases} 0 & WTP < p \quad (No) \\ 1 & p \le WTP \quad (Yes). \end{cases} \tag{4}$$

Individuals' WTP for a particular product is based on random utility – respondents maximize their utility by choosing to purchase a product at the associated price only if the utility they derive from the good is greater than the utility derived from refusing the price and foregoing purchasing the product. The probability of each outcome can be expressed as

$$\Pr(Y = D) = \begin{Bmatrix} G(v(p, \boldsymbol{\psi})) \\ 1 - G(v(p, \boldsymbol{\psi})) \end{Bmatrix} \text{for} \quad D = \begin{Bmatrix} 0 \\ 1 \end{Bmatrix} \tag{5}$$

where $G(\cdot)$ is a cumulative distribution function characterizing the random components of utility, $v(p, \boldsymbol{\psi})$ is the difference in indirect utility between purchasing the product at price p and declining the price, and $\boldsymbol{\psi}$ is a vector of characteristics that influence the indirect utility. The function $v(p, \boldsymbol{\psi})$ in equation 6 for individual i can be written as

$$v\left(p_{ij},\boldsymbol{\psi}_{ij}\right)=\alpha-\rho p_{ij}+\lambda'\mathbf{Z}_i+\mu'O_j \qquad i=1,2,\ldots,n \quad j=1,2,3 \tag{6}$$

where p_{ij} is the price of oyster *j* offered to participant *i* and $\mathbf{Z}_i$ is a vector of observable characteristics of *i,* including frequency of consumption of oysters per year, gender, age, education, income, shopping behaviors, and oyster perception factors calculated by factor analysis, and α, ρ, λ, and μ are unknown parameters to be estimated. The log-likelihood function can then be expressed as

$$\ln L=\sum_{i=1}^{n}\begin{Bmatrix} I_{D=0}\ln G\left(\alpha-\rho p_{ij}+\lambda'Z_i+\mu'O_j\right)+ \\ I_{D=1}\ln\left[1-G\left(\alpha-\rho p_{ij}+\lambda'Z_j+\mu'O_j\right)\right]\end{Bmatrix} \tag{7}$$

where $I_{D=\{0,1\}}$ is the indicator for each *D* outcome for individual *i*. We define the $G(\cdot)$ function as the standard logistic distribution with mean zero, a within-subject error term $\upsilon_i \sim$, and an individual error term $\varepsilon_{ij} \sim$ where $\sigma^2=\pi^2/3$.

Data

Table 1 summarizes the demographic characteristics of the 758 adult participants in the study comprised of 341 individuals from the State DMV and 417 individuals from the Lewes-Cape May ferry terminal. Note that although the DMV only serves Delaware residents, ferry passengers may not be exclusively tourists. However, the ferry is operated for tourism purposes and is not known for a commuter route, it is reasonable to assume that the vast majority of passengers are tourists. Thus, we refer to participants at this location as tourists for simplicity. The average tourist respondent was about 49 years old while the average local respondent was about 40 years old. The ratio of women to men was somewhat greater than 50% in the tourist group (56.51%) and somewhat less than 50% in the local resident group (45.06%). In terms of education, 63.11% of the tourist participants and 31.45% of the local

resident participants had some type of university degree. The two groups did not differ significantly in the percentage of participants who frequently consumed oysters (defined as individuals who consume oysters at least six times per year) or in the number of respondents who reported being the household's primary shopper.

The groups differed markedly in the ratio of respondents having annual household incomes exceeding $75,000. The ratio for the local resident group was 22.15%, while just over half of the participants in the tourist group (51.12%) had incomes that exceeded that threshold. From the survey data, we can conclude that the average tourist participant was older and had a higher income and higher level of education than the average local resident participant had. This is not necessarily surprising since the participants in the tourist group were traveling for recreation while the local resident group drew from the population in general.

The survey asked participants to evaluate the importance of each of the eight oyster attributes (species, shell size, meat size, saltiness, smell, shell color, meat color, and harvest location) on a 1 to 9 scale in which 1 represented not at all important and 9 indicated extremely important. As shown in Figure 1, which depicts average scores for the two groups, respondents in both samples valued oysters' smell and meat color most (average score between 6 and 7) and oyster size and species least (average score between 4 and 5). The other attributes received average scores of about 5.5 in both samples. Interestingly, local residents reported higher scores for the attributes than tourists with the exception of harvest location, suggesting that consumers tend to pay more attention to the locality of their food when traveling than when making purchases at home.

We estimated correlation coefficients for consumer valuations for pairs of oyster attributes and present the results for local residents in Table 2 and for tourists in Table 3. All

of the coefficients are positive and significantly correlated at the 1% level of significance, which indicates that consumers who value one oyster attribute as very important are likely to place relatively high importance on other attributes as well. The tourist and resident groups produce similar correlation coefficients for each pair of oyster attributes. It suggests that there is a set of underlying variables that can help explain the interrelationship among consumer valuations for different oyster attributes. Therefore, next we conduct an exploratory factor analysis to gain understanding of the underlying reasons that affect these variables.

Table 4 shows the results of a factor analysis used to identify potential influences on consumption behavior such as general perceptions of seafood safety and quality. The table presents factor loadings (Hair, 1998) for the resident group; the loadings for the tourist group are similar and thus are not reported. The first factor incorporated into the econometric model, labeled *undiscerning*, describes consumers who are not particularly interested in specific attributes of oysters they consume in which all of the oyster attributes are perceived as approximately equally important. The second, *discerning*, describes the latent sense of more-professional oyster consumers as it puts significantly more weight on the oysters' harvest locations and species. We expected that *undiscerning* would have an insignificant coefficient on the oyster purchase decision while *discerning* would have a positive coefficient. We further expected that the effects of these variables, along with the demographic characteristics, on WTP for oysters for tourists and residents would be similar.

Results

Using a random-effects logit model, we investigate factors that influence respondents' decisions regarding purchasing fresh oysters. In Table 5, we summarize the results of our analysis of the local residents group and the tourists group separately. We first discuss the results from the local residents' sample. As anticipated, price had a significant and largely

negative effect. When the price of the oysters increased by one dollar, respondents were 18% less likely to choose to purchase them. Among resident consumers, participants who consumed oysters frequently were more likely to buy oysters, a result that was significant at the 10% level. Age had a significantly negative effect on likelihood of purchasing. The discerning oyster consumers, who most valued the oysters' species and harvest locations, were more likely to buy oysters than undiscerning consumers were.

The results for local and non-local labeling are compared to oysters that had no label regarding their origin. Participants who learned from the label that the oysters were not local were 6% less likely to buy (significant at the 5% level). The coefficient for likelihood of purchasing oysters labeled as local was not statistically significant. A Wald test shows inequality between these two coefficients ($p = 0.003$), suggesting that participants in this sample preferred local oysters to non-local ones at the 1% significance level. The coefficients on the demographic variables signifying gender and level of education of the local resident respondents were not statistically significant.

Next, we report results of our analysis of the tourists group. Again, as expected, price had a significant and largely negative effect – a one-dollar increase in the price reduced their likelihood of purchasing the oysters by 10%. As with the local residents, participants who frequently consumed oysters were more likely to buy oysters than the other tourist participants were. In this case, education had a significantly positive effect at the 1% level of significance. With each step up in education category, the likelihood of purchasing oysters increased by 3%. None of the other demographic variables had a statistically significant effect.

Labeling the origin of the oysters had a stronger effect on the tourist participants. The coefficient on oysters labeled as local was statistically significant, indicating that the tourist

participants were 3% more likely to buy those oysters than oysters with no origin label, and they were 11% less likely to buy the oysters labeled as non-local. A Wald test also shows statistically significant inequality between these two coefficients ($p = 0.000$).

In both samples, participants' *preference for* local oysters is to a lesser degree compared to their *distaste against* non-local oysters. Many other studies find a similar result that negative information has a much greater impact than positive information. For example, Anand et al. (2007) find that negative information had substantially more of an effect on consumers' WTP for food products than the positive information. This is also consistent with other studies including Tegene et al. (2003), who observe that individuals place a greater weight on negative information than on positive information.[6] From an economic theory standpoint, negative information has a larger utility effect than positive information with concave utility functions, so one should expect the impact to be larger (McCluskey et al., 2015).

We further analyze the pooled data with an interaction term between two indicator variables representing the tourist sample and the local label (Table 6). To directly draw evidence on participants' relative preference for local versus non-local oysters, we use non-local oysters as the baseline in this model. The estimated marginal effects suggest that, compared to local residents, the tourist sample has a stronger distaste for non-local oysters while a stronger preference for local oysters.

In summary, the results show that the demographic and attitudinal variables had similar effects on resident and tourist participants. Demand for oysters in both groups was negatively correlated with price but tourists were less sensitive to price changes than

[6] There are other similar findings in the literature. For example, Li et al. (2018) find that when individuals are presented with three-tiered eco-labels, their average WTP premium for the highest tier is smaller compared to discount for the lowest tier, with the middle tier being the reference point. Another relevant study by Kanter et al. (2009) suggests the introduction of organic milk reduces consumers' WTP for conventional milk.

residents were. Both groups also preferred local oysters to non-local oysters but the effect of locality was stronger among the tourists.

We subsequently calculated mean WTP for both samples using Hanemann's approach (1984):

$$WTP = \frac{1}{\hat{\rho}}(\hat{\alpha} + \hat{\lambda}'\bar{Z} + \hat{\mu}'\bar{O}_j) \quad \forall j. \tag{8}$$

For this calculation, we truncated protest respondents from our samples – respondents who always chose not to purchase the offered oysters (Dziegielewska & Mendelsohn, 2007). The administrators strived to recruit only individuals who already consumed oysters or were interested in trying them. The proportions of first-time oyster consumers in the resulting samples were 26% of the local residents and 25% of the tourists, which could explain the presence of protest respondents observed in both groups. We acknowledge that eliminating protest respondents from the samples reduces downward bias in the WTP estimates but may introduce self-selection bias (Halstead et al., 1992). However, eliminating those respondents enabled us to gain clearer insight into any potential variation in consumers' preferences for local and non-local oysters.

We found that local residents were willing to pay an average of $1.67 for an oyster and tourists were willing to pay an average of $1.69. Figure 2 presents our estimates of mean WTP for local and non-local oysters. The results suggest that, on average, both residents and tourists were willing to pay more for local oysters – WTP of $1.82 and $2.14 respectively – than for non-local oysters, which had a WTP of $1.63 and $1.51 respectively. The difference in WTP for local and non-local oysters was greater for tourists (a premium of $0.63) than for residents (a premium of $0.19).

Conclusions

Buying locally produced food continues to grow in popularity as a way to obtain fresher food products, support local businesses, and potentially reduce the negative environmental consequences of transporting food long distances. In the case of seafood, food safety concerns and a desire for higher quality likely also motivate consumers, as can ecosystem services provided by some species such as oysters that improve the quality of the water in which they grow. Many of these motivations for purchasing locally produced food are associated with consumers' connections to their local communities. We are interested in understanding whether community concerns dominate the desire to purchase local foods or whether visitors to an area also prefer to buy foods produced locally. The results can inform both producers and marketers of local food products, particularly in areas in which tourism is a significant contributor to the economy. Using a framed field experiment, this study focuses on estimating local resident and tourist consumers' likelihood of purchasing and WTP for local and non-local oysters. We also identify how various demographic characteristics and attitudes regarding oyster attributes affect their willingness to purchase oysters.

In general, we find the effects of the demographic and attitudinal characteristics on WTP are consistently similar across groups. Consumers in both groups favor local oysters to oysters with no information about their origin and are less willing to pay for oysters identified as non-local. Interestingly, in both groups the WTP premiums for local oysters are smaller than the WTP discounts for non-local oysters in terms of magnitude and statistical significance. We find, however, that the magnitude of preferences for local oysters are stronger in the tourist group – they are willing, on average, to pay a larger premium for local oysters than local residents, indicating that tourists care somewhat more about the origin of the oysters. Additional study is required to elucidate the reasons for this difference. Tourists

may be particularly interested in "local flavor" and culture in destinations they visit (Sengel et al., 2015) or may associate locally produced food as fresher and higher in quality.

The results of this study suggest that areas that provide popular tourism destinations should develop their local food industries and market those locally produced foods to residents and to tourists. They likely will benefit from emphasizing not only the greater freshness and environmental benefits of local foods but also the unique brands and varieties of products that define particular communities and destinations.

REFERENCES

Adams, D. C., & Salois, M. J. (2010). Local versus organic: A turn in consumer preferences and willingness-to-pay. *Renewable agriculture and food systems*, 25(4), 331-341.

Ahearn, M., & Stern, J. (2013). Direct-to-consumer sales of farm products: Producers and supply chains in the Southeast. *Journal of Agricultural and Applied Economics,* 45(3), 497-508.

Alfnes, F., Chen, X., & Rickertsen, K. (2018). Labeling farmed seafood: A review. *Aquaculture Economics & Management*, *22*(1), 1-26.

Anand, A., Mittelhammer, R. C., & McCluskey, J. J. (2007). Consumer response to information and second-generation genetically modified food in India. *Journal of Agricultural & Food Industrial Organization*, *5*(1), Article 8.

Armington, P. S. (1969). A theory of demand for products distinguished by place of production. *Staff Papers*, *16*(1), 159-178.

Balaguer, J., & Cantavella-Jorda, M. (2002). Tourism as a long-run economic growth factor: The Spanish case. *Applied economics*, *34*(7), 877-884.

Chen, J. Q., Haws, M. C., Fong, Q. S., & Leung, P. (2017). Locally grown oysters in Hawaii: Chef preference and local premium? *Journal of the World Aquaculture Society*, *48*(6), 972-980.

Coen, L. D., Brumbaugh, R. D., Bushek, D., Grizzle, R., Luckenbach, M. W., Posey, M. H., ... & Tolley, S. G. (2007). Ecosystem services related to oyster restoration. *Marine Ecology Progress Series*, *341*, 303-307.

Cooke, S., & Watson, P. (2011). A comparison of regional export enhancement and import substitution economic development strategies. *Journal of Regional Analysis & Policy*, *41*(1), 1-15.

Darby, K., Batte, M. T., Ernst, S., & Roe, B. (2008). Decomposing local: A conjoint analysis of locally produced foods. *American Journal of Agricultural Economics*, *90*(2), 476-486.

Delaware Tourism Office (2019). The value of tourism in Delaware. Accessed July, 2019 at https://www.visitdelaware.com/industry/tourism-statistics/.

Dziegielewska, D. A., & Mendelsohn, R. (2007). Does "No" mean "No"? A protest methodology. *Environmental and Resource economics*, *38*(1), 71-87.

Fayissa, B., Nsiah, C., & Tadasse, B. (2008). Impact of tourism on economic growth and development in Africa. *Tourism Economics*, *14*(4), 807-818.

Giraud, K. L., Bond, C. A., & Bond, J. K. (2005). Consumer preferences for locally made specialty food products across northern New England. *Agricultural and Resource Economics Review*, *34*(2), 204-216.

Grebitus, C., Lusk, J. L., & Nayga Jr, R. M. (2013). Effect of distance of transportation on willingness to pay for food. *Ecological Economics*, *88*, 67-75.

Hair, J. F. (1998). Multivariate data analysis. www.worldcat.org/title/multivariate-data-analysis/oclc/989250636?referer=brief_results.

Halstead, J. M., Luloff, A. E., & Stevens, T. H. (1992). Protest bidders in contingent valuation. *Northeastern Journal of Agricultural and Resource Economics*, *21*(2), 160-169.

Hand, M. S., & Martinez, S. W. (2010). Just what does local mean?. *Choices*, *25*(1), 1-4.

Hanemann, W. M. (1984). Welfare evaluations in contingent valuation experiments with discrete responses. *American Journal of Agricultural Economics*, *66*(3), 332-341.

Jekanowski, M. D., Williams, D. R., & Schiek, W. A. (2000). Consumers' willingness to purchase locally produced agricultural products: An analysis of an Indiana survey. *Agricultural and Resource Economics Review*, *29*(1), 43-53.

Kanter, C., Messer, K. D., & Kaiser, H. M. (2009). Does production labeling stigmatize conventional milk? *American Journal of Agricultural Economics, 91(4), 1097-1109.*

Kecinski, M., Messer, K. D., Knapp, L., & Shirazi, Y. (2017). Consumer preferences for oyster attributes: Field experiments on brand, locality, and growing method. *Agricultural and Resource Economics Review*, *46*(2), 315-337.

Li, T., Kecinski, M., & Messer, K. D. (2018). Behavioural responses to science-based eco-labelling: Gold, silver, or bronze. *Applied Economics*, *50*(39), 4250-4263.

Li, T., Kecinski, M., & Messer, K. D. (2017). Heterogeneous preferences for oysters: Evidence from field experiments. *Agricultural and Resource Economics Review*, *46*(2), 296-314.

Li, T., & Messer, K. D. (2019). To scan or not to scan: The question of consumer behavior and QR codes on food packages. *Journal of Agricultural and Resource Economics*, *44*(2), 311-327.

Lim, K. H., & Hu, W. (2016). How local is local? A reflection on Canadian local food labeling policy from consumer preference. *Canadian Journal of Agricultural Economics/Revue canadienne d'agroeconomie*, *64*(1), 71-88.

Loose, S. M., Peschel, A., & Grebitus, C. (2013). Quantifying effects of convenience and product packaging on consumer preferences and market share of seafood products: The case of oysters. *Food Quality and Preference*, *28*(2), 492-504.

Loureiro, M. L., & Hine, S. E. (2002). Discovering niche markets: A comparison of consumer willingness to pay for local (Colorado grown), organic, and GMO-free products. *Journal of Agricultural and Applied Economics*, *34*(3), 477-487.

McClenachan, L., Neal, B. P., Al-Abdulrazzak, D., Witkin, T., Fisher, K., & Kittinger, J. N. (2014). Do community supported fisheries (CSFs) improve sustainability?. *Fisheries Research*, *157*, 62-69.

McCluskey, J. J., Swinnen, J., & Vandemoortele, T. (2015). You get what you want: A note on the economics of bad news. *Information Economics and Policy*, *30*, 1-5.

Morey, M. (2016). Preferences and the home bias in trade. *Journal of Development Economics*, *121*, 24-37.

NOAA (National Oceanic and Atmospheric Administration). (2019). Basic questions about aquaculture. Accessed July, 2019 at http://www.nmfs.noaa.gov/aquaculture/faqs/faq_aq_101.html.

Peterson, H. H., Taylor, M. R., & Baudouin, Q. (2015). Preferences of locavores favoring community supported agriculture in the United States and France. *Ecological Economics*, *119*, 64-73.

Petrolia, D. R., Walton, W., & Acquah, S. (2014). A national survey of consumer preferences for branded Gulf oysters and risk perceptions of Gulf seafood. *Available at SSRN 2528576*.

Schneider, M. L., & Francis, C. A. (2005). Marketing locally produced foods: Consumer and farmer opinions in Washington County, Nebraska. *Renewable Agriculture and Food Systems*, 20(4), 252-260.

Sengel, T., Karagoz, A., Cetin, G., Dincer, F. I., Ertugral, S. M., & Balık, M. (2015). Tourists' approach to local food. *Procedia-Social and Behavioral Sciences*, *195*(1), 429-437.

Shilcutt, K. (2012). Wine has Terroir; Oysters have 'Merroir,' and we'll pay more for it. *Houston Press*. Available at www.houstonpress.com/restaurants/wine-has-terroir-oysters-have-merroir-and-well-pay-more-for-it-6403224.

Soley, G., Hu, W., & Vassalos, M. (2019). Willingness to pay for shrimp with Homegrown by Heroes, Community-Supported Fishery, Best Aquaculture Practices, or Local Attributes. *Journal of Agricultural and Applied Economics*, *51*(4), 606-621.

Tegene, A., Huffman, W. E., Rousu, M., & Shogren, J. F. (2003). The effects of information on consumer demand for biotech foods: Evidence from experimental auctions. *Technical bulletins*, United States Department of Agriculture- Economic Research Service (USDA-ERS).

Thilmany, D., Bond, C. A., & Bond, J. K. (2008). Going local: Exploring consumer behavior and motivations for direct food purchases. *American Journal of Agricultural Economics*, *90*(5), 1303-1309.

Toler, S., Briggeman, B. C., Lusk, J. L., & Adams, D. C. (2009). Fairness, farmers markets, and local production. *American Journal of Agricultural Economics*, *91*(5), 1272-1278.

Venkatachalam, L. (2004). The contingent valuation method: A review. *Environmental Impact Assessment Review*, *24*(1), 89-124.

Wessells, C. R., & Anderson, J. G. (1995). Consumer willingness to pay for seafood safety assurances. *Journal of Consumer Affairs*, *29*(1), 85-107.

World Bank (2018). World tourism organization, yearbook of tourism statistics. https://data.worldbank.org/indicator/ST.INT.RCPT.CD. Retrieved October 2018.

Zepeda, L., & Leviten-Reid, C. (2004). Consumers' views on local food. *Journal of Food Distribution Research*, *35*(3), 1-6.

Table 1. Summary statistics for Demographic Variables

	Local residents	**Tourists**
Number of respondents	341	417
Average age (years)	40.20	48.65
Variable	**Percent of respondents**	
Female	45.06%	56.51%
Primary shopper	67.59%	65.11%
Education (highest level)		
Some school	6.23%	1.21%
High school diploma	33.83%	16.50%
Some college	28.49%	19.17%
Bachelor's/Associate degree	22.55%	34.95%
Graduate/Professional degree	8.90%	28.16%
Household income (in 2014 or 2015)		
Less than $10,000	13.47%	3.23%
$10,000 to $24,999	16.47%	10.42%
$25,000 to $34,999	19.46%	7.44%

$35,000 to $74,999	28.44%	27.79%
$75,000 to $99,999	8.98%	14.89%
$100,000 to $149,999	8.98%	18.86%
$150,000 to $249,999	3.59%	11.41%
$250,000 or more	0.60%	5.96%
Annual Oyster Consumption (times)		
0	23.67%	34.95%
1–2	36.09%	30.83%
3–5	22.78%	13.59%
6–9	9.17%	8.74%
10 or more	8.28%	11.89%

Table 2. Correlation coefficients between Consumer Valuations for Oyster Attributes for the sample of local residents

	Smell	**Meat color**	**Saltiness**	**Location**	**Appearance**	**Size**	**Shell Color**	**Species**
Smell	1.00							
Meat color	0.67	1.00						
Saltiness	0.43	0.50	1.00					
Location	0.35	0.47	0.31	1.00				
Appearance	0.53	0.54	0.42	0.35	1.00			
Size	0.37	0.45	0.39	0.41	0.41	1.00		
Shell color	0.43	0.64	0.38	0.39	0.66	0.40	1.00	
Species	0.24	0.30	0.30	0.52	0.35	0.50	0.35	1.00

Note: Pair-wise correlation coefficients between all variables are significant at the 1% level.

Table 3. Correlation coefficients between Consumer Valuations for Oyster Attributes for the tourists' sample

	Smell	Meat color	Saltiness	Location	Appearance	Size	Shell Color	Species
Smell	1.00							
Meat color	0.68	1.00						
Saltiness	0.53	0.51	1.00					
Location	0.43	0.44	0.50	1.00				
Appearance	0.48	0.60	0.47	0.34	1.00			
Size	0.40	0.50	0.49	0.38	0.56	1.00		
Shell color	0.40	0.60	0.45	0.43	0.63	0.48	1.00	
Species	0.30	0.31	0.45	0.48	0.31	0.53	0.36	1.00

Note: Pair-wise correlation coefficients between all variables are significant at the 1% level.

Table 4. Summary of Factor Analysis Results for the local residents' sample

	Factor Loading	
Variable	**Factor 1 (Undiscerning)**	**Factor 2 (Discerning)**
Location	0.5954	0.2880
Species	0.5431	0.4424
Size	0.6158	0.2466
Appearance	0.7219	–0.1461
Saltiness	0.5808	–0.0356
Smell	0.6768	–0.2478
Shell color	0.7341	–0.1309
Meat color	0.8056	–0.2154

Table 5. Coefficient estimates of the explanatory variables on Yes-decisions to purchase oysters using Random-Effects Logistic Regression for the local residents' sample and the tourists' sample.

Parameters	Coefficient estimates	Marginal effects	Coefficient estimates	Marginal effects
Price	–1.92(0.33)***	–0.18***	–1.50(0.28)***	–0.10***
Frequent	0.38(0.20)*	0.04*	0.69(0.19)***	0.05***
Female	–0.28(0.38)	–0.03	–0.42(0.42)	–0.03
Age	–0.03(0.01)**	–0.003**	–0.01(0.01)	–0.001
Education	0.09(0.14)	0.01	0.36(0.15)***	0.03***
Income	0.08(0.10)	0.01	0.02(0.09)	0.002
Primary shopper	–0.30(0.40)	–0.03	0.15(0.46)	0.01
Discerning	0.60(0.29)**	0.06**	0.32(0.28)	0.02
Undiscerning	–0.14(0.23)	–0.01	–0.11(0.25)	–0.01
Local	0.17(0.24)	0.02	0.47(0.25)*	0.03*
Non-local	–0.64(0.28)**	–0.06**	–1.60(0.31)***	–0.11***
	Local resident's sample, N=972		**Tourists' sample, N=1,221**	

Note: *10% significance level, **5% significance level, ***1% significance level, robust standard errors in parentheses.

Table 6. Coefficient estimates of the explanatory variables on Yes-decisions to purchase oysters using Randomized-Effects Logistic Regression (Pooled sample)

Parameters	**Coefficient estimates**	**Marginal effects**
Price	–1.50(0.26)***	–0.12***
Frequent	0.48(0.14)***	0.04***
Female	–0.42(0.29)	–0.03
Age	–0.03(0.01)***	–0.00***
Education	0.18 (0.10)*	0.01*
Income	0.04(0.07)	0.00
Primary shopper	–0.06(0.31)	0.01
Discerning	0.32 (0.21)	0.03
Undiscerning	–0.01(0.17)	0.00
Local	0.75(0.27)***	0.06***
Non-local	Baseline	—
Tourist	–1.38(0.40)***	–0.11***
Tourist*Local	1.14(0.39)***	0.09***
	Pooled sample, N=1462	

Note: *10% significance level, **5% significance level, ***1% significance level, robust standard errors in parentheses.

Appendix A- Experiment Instructions

Please read these instructions carefully and do not communicate with any other participants while you are making your decisions.

- **We will give you $10 that you may use to purchase oysters in this study or you may keep.**
- Depending on the choices you make, you may receive a combination of cash and oysters. There is the possibility of you owing us money if the cost of your oysters is greater than $10. In such case, you can pay with cash, check or credit card for the oysters.
- Your decisions are just like the ones you make in a store, you either buy at the listed price or you don't.

Guidelines:

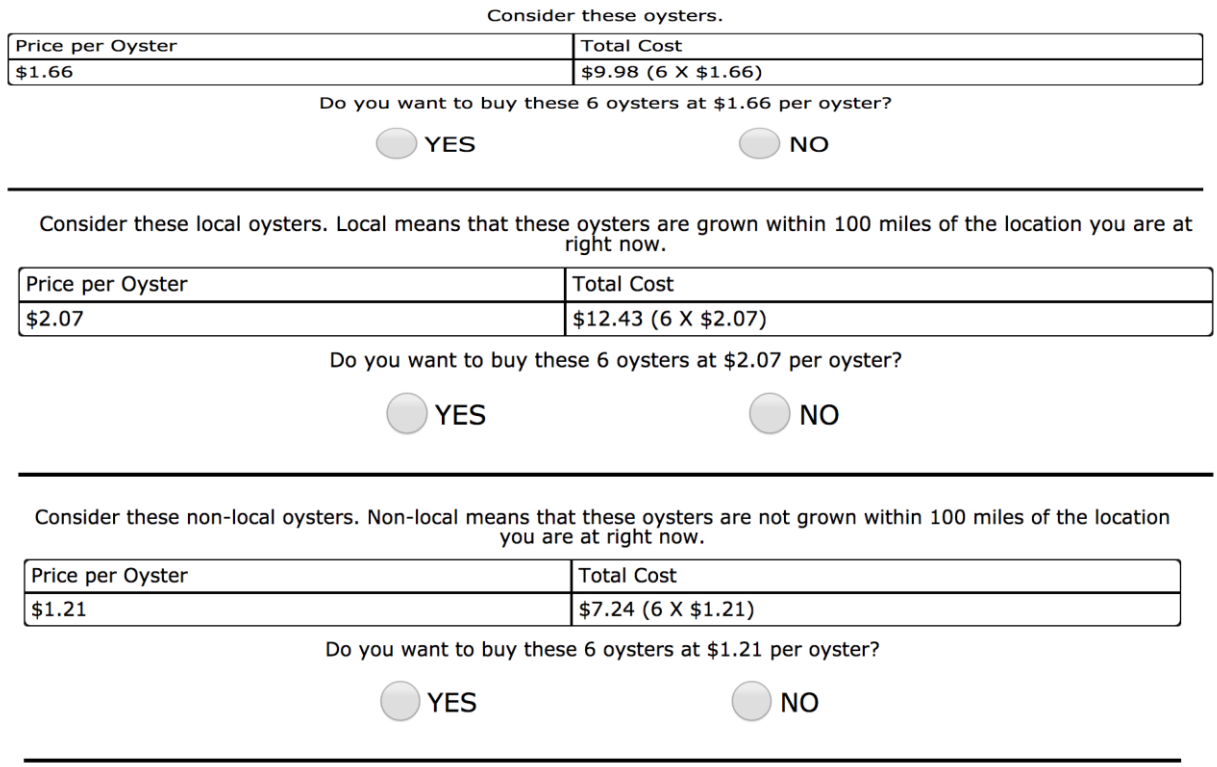
1. Decide how many oysters you want to buy (3, 6, 9 or 12)
2. Decide how you would like your oysters prepared (raw on the half shell, fried, in a bag with ice)
3. Decide if you want to buy the oyster options at the listed price by selecting 'Yes' or 'No'
4. Fill out a short survey
5. Roll a digital die to determine which oyster option will be implemented (only one will be implemented)

Example 1: If you selected 'Yes' for an oyster option that costs $7 and this option is implemented, you will receive the oysters and $3 cash ($10 - $7 = $3).

Example 2: If you selected 'No' for an oyster option and this option is implemented, you will receive $10 and will not receive any oysters.

Example 3: If you selected 'Yes' for an oyster option that costs $15 and this option is implemented, you will receive the oysters and owe $5 ($10 - $15 = -$5).

Appendix B – Decision-making Interface



***Note*:** The order of the second and third options (between local and non-local) was randomized by Python-Willow so participants were presented with various orders. The price for each product was randomly drawn from a distribution that represents the market price of oysters.

Appendix C – Survey

1. Are you a first time oyster consumer?
   - Yes
   - No
2. How often do you consume oysters?
   - 0 times per year
   - 1-2 times per year
   - 3-5 times per year
   - 6-9 times per year
   - >9 times per year
3. Are you the primary shopper in your household?
   - Yes
   - No
4. In a typical month, approximately how many times do you eat seafood?

5. In a typical month, approximately how many times do you eat at restaurants?

6. When you eat at a restaurant, what is the percentage of seafood versus other food?

7. How often do you eat seafood at home versus at a restaurant?

8. Are you the primary seafood shopper in your household?
   - Yes
   - No

9. How often do you catch your own seafood?
   Never (1) - Very Often (9)

10. How important is location in your oyster choice?
    Not Important (1) - Very Important (9)

11. For oysters from the Delaware Bay, I would...
    - pay more than other locations.
    - pay less than other locations.
    - pay the same as other locations.

12. For oysters from the Delaware Inland Bays, I would...
    - pay more than other locations.
    - pay less than other locations.
    - pay the same as other locations.

13. How do you usually prefer the preparation of your oysters?
    - Raw on the half shell
    - Raw in a shooter
    - Fried
    - Grilled
    - Other

14. How important are the following oyster characteristics to you?
    Oyster Species:
    Not Important (1) - Very Important (9)
    Size of the oyster shell:
    Not Important (1) - Very Important (9)
    Size of the oyster meat:
    Not Important (1) - Very Important (9)
    Appearance of the oyster shell:
    Not Important (1) - Very Important (9)
    Saltiness of the oyster:
    Not Important (1) - Very Important (9)

Smell of the oyster:
Not Important (1) - Very Important (9)
Color of the oyster shell:
Not Important (1) - Very Important (9)
Color of the oyster meat:
Not Important (1) - Very Important (9)
Location of harvest:
Not Important (1) - Very Important (9)

15. On average, how often do you go to the beach each year?
    - 0 times per year
    - 1-2 times per year
    - 3-5 times per year
    - 6-9 times per year
    - >9 times per year
16. What is your age?
17. What gender do you identify yourself as?
    - Male
    - Female
18. Are you:
    - Politically liberal
    - Politically moderate
    - Politically conservative
    - Other (please specify)
19. Which category best describes your household income (before taxes) in 2016?
    - Less than $10,000
    - $10,000-$14,999
    - $15,000-$24,999
    - $25,000-$34,999
    - $35,000-$49,999
    - $50,000-$74,999
    - $75,000-$99,999
    - $100,000-$149,999
    - $150,000-$199,999
    - $200,000-$249,999
    - $250,000 and above
20. What is the highest level of education that you have completed?

- Grade school
- Some high school
- High school graduate
- Some college credit
- Associate degree
- Bachelor's degree
- Graduate degree/Professional