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Abstract

We administered an online choice experiment to a sample of U.S. raw oyster consumers to identify factors influencing preferences for Gulf of Mexico oysters, and to estimate willingness-to-pay for specific attributes, including harvest location / brand, price, size, taste (saltiness), and cultivation method (wild vs. farm-raised). This work was complemented by taste panels conducted in Point Clear (Alabama), Houston, and Chicago. During taste panels, local branded varieties dominate consumer choice, although these same varieties fare no better than other varieties under blind taste-tests. Online survey results indicate that Non-Gulf respondents are likely to require a price discount on Gulf varieties relative to local varieties, on the order of $3-9 per half-dozen, depending on the specific variety and other factors. Although most Gulf respondents chose the cheaper generic Gulf oyster over branded Gulf varieties, we still estimate positive price premia for branded Gulf varieties of up to $5 per half-dozen.

Keywords: branding, choice experiment, consumer preferences, economics, labeling, survey, willingness to pay

JEL Codes: D12, Q22

Introduction

The U.S. Gulf states of Alabama, Florida, Louisiana, Mississippi, and Texas harvested 8,731 MT of the eastern oyster (*Crassostrea virginica*) in 2013, accounting for over 75% of total production for the U.S. (NMFS 2014). Yet the value of the Gulf states' harvest represents only 53% of the total market value because Gulf oysters sell at significantly lower prices relative to those produced in Atlantic and Pacific states (National Marine Fisheries Service, 2011). While many factors affect these prices, the extensive, on-bottom method of oyster farming practiced in Louisiana and other Gulf states has primarily targeted production of large quantities of affordable oysters, which are sold by the sack to processors and typically sold as shucked meats, in sharp contrast to the sales by piece along the northeast Atlantic and Pacific coasts for the live shellstock market. Furthermore, the condition and appearance of extensively cultured oysters is highly-dependent upon season and harvest location, which can lead to large variation in the quality of the product on the half-shell market.

Although they are the same species, oysters marketed along the Atlantic coast, for example, sell under regional names such as Wellfleets (from Cape Cod), Blue Points (Long Island), and Chincoteagues (Virginia). Gulf oysters, on the other hand, are usually sold as generic oysters, as Jacobsen (2011) says, "indicative of a region that pays less attention to the nuances of different raw oysters than to their culinary possibilities." The major exceptions on the Gulf coast are Apalachicolas (Florida), which comprise the bulk of Florida's oyster harvest. Although there is no clear evidence that they sell at a premium, there is anecdotal evidence to suggest that a market has developed for these branded oysters and that additional opportunities may exist.

An alternative source of oyster production is off-bottom farm-raised oysters. Although they currently make up only a very small portion of production in the Gulf, they tend to sell at a premium in high-end restaurants because of their superior aesthetic qualities. Since 2009, nearly two dozen off-bottom oyster farms have been established in the Gulf of Mexico region. This alternative production method allows for greater control of aesthetic characteristics, yielding a potentially higher-value product. The potential for geographical branding and a relative shift in focus from quantity to quality, provides an opportunity for Gulf oyster producers to reach new markets, increase existing market share, and/or increase market value.

We designed and administered an online choice experiment to a panel of U.S. oyster consumers to identify factors influencing preferences for Gulf oysters, and to estimate willingness-to-pay for specific oyster attributes, including harvest location or brand, price, size, taste (saltiness), and cultivation method (wild vs. farm-raised). This work was complemented by in-person taste panels conducted at restaurants in Point Clear, Alabama; Houston, Texas; and Chicago, Illinois. Although previous work has used both survey methods and in-person taste-based preference-elicitation methods to ascertain consumer opinions regarding oysters, they have focused primarily on preferences for oysters at a very general level (House, Hanson, and Sureshwaran 2003; Kow et al. 2008), post-harvest processing and related risk-reduction initiatives (Bruner et al. 2001; Lin and Milon 1993; Morgan et al. 2013; Morgan, Martin, and Huth 2009; Whitehead et al. 2012), or preferences for non-native species or triploids (Bishop and Peterson 2005; Grabowski et al. 2003; Nell, O'Riordan, and Ogburn 2006). Only Manalo and Gempesaw (1997) utilized a choice experiment to identify preferences over specific attributes, with their focus on price, production method (wild-caught versus farm-raised), and inspection agency (FDA versus USDA). We are aware of no studies that have addressed preferences over

specific harvest locations and other key attributes, including derivation of willingness-to-pay estimates, as we do here.[1]

Consumer Taste Panels: Experimental Design

Three taste panels were conducted. The first was held December 7, 2012 at the Grand Hotel Marriott Resort in Point Clear, Alabama. The second was held February 13, 2013 at Reef in Houston, Texas. The third was held November 11, 2013 at Shaw's Crab House in Chicago, Illinois.

The experimental design for the Point Clear and Houston taste panels was a 12-row design that included 4 alternatives (branded oyster A, branded oyster B, generic Gulf oyster, and none of the above), and the Chicago panel was a 12-row design that included three alternatives (branded oyster A, branded oyster B, and branded oyster C).[2] Branded oysters included in each taste panel are shown in Table 1. In the Point Clear and Houston panels, "generic" Gulf oysters were featured in each choice set, as this represents the predominant means by which Gulf oysters

[1] Overall, research on oyster markets appears to be limited. Related work includes Martínez-Cordero, Fong, and Haws (2009), who interviewed restaurant owners and managers to assess consumer preferences for oysters. Additionally, Dedah, Keithly, and Kazmierczak (2011); Lipton (2008); and Keithly and Diop (2001) analyzed various shocks to oyster markets using market data.

[2] We decided to omit the "none of the above" alternative in the Chicago taste panel after almost no participants utilized it during the previous two panels. This simplified the design as well as the choice task for the participants.

are sold in Gulf markets. Randomly-assigned prices for branded oyster alternatives were $6, 8, 10, 12, 14, and 16 per half-dozen during the Point Clear and Houston panels, and $10, 12, 14, 16, 18, and 20 per half-dozen for the Chicago panel. Generic Gulf oysters were priced at $5, 7, and 9 per half-dozen. The experimental design was generated using NGene software, and optimized according to s-efficiency (Choice Metrics 2012).

For all three taste panels, the host venue was allowed to recruit participants from each's own customer base. Participants were asked to review and sign a consent form upon arrival at the event site. They were then allowed to sit anywhere they liked. Participants were asked to treat the event as they would a regular trip to an oyster bar. Thus, they were allowed to drink and converse as they normally would, with the exception of discussing the oysters themselves (and their opinions of them) once the tasting began. Participants appeared to have adhered to these rules. Participants were generally discouraged from amending the oysters with any excessive condiments. Only a few actually requested such, and were limited to lemon juice and hot sauce.

After participants were all seated, an introduction was given by the session moderator to provide general information (including health risks associated with eating raw oysters) about the reason for the taste panel, what participants would be asked to do during the panel, and to explain in detail the vote cards. For the latter, the vote cards for the first round were handed out to facilitate explanation. Participants were then given the opportunity to ask any clarifying questions. After all participants' questions and concerns were addressed, the first round of oysters were served.

Each seating consisted of four rounds, and each round consisted of 3 oyster alternatives. During the first two rounds, the oysters were served blind, i.e., participants were not told which varieties of oysters they were evaluating. After evaluating the three oysters, participants filled

out a vote card for that round. The vote card indicated the posted (hypothetical) price per half-dozen for each alternative. In the blind rounds, these were labeled simply "A", "B", and "C". Participants indicated which of the three alternatives they were "most likely to buy" at the posted prices, and which of the three alternatives there were "least likely to buy" at the posted prices. This elicitation approach is a variant of the best-worst elicitation (BWE) method (Flynn and Marley 2012; Flynn et al. 2007; Marley and Louviere 2005; Potoglou et al. 2011; Scarpa et al. 2011). The argument is made that choosing "bests" and "worsts" (in our case, "most likely to buy" and least likely to buy") is a relatively easy task for respondents, and yields more information per choice set than other formats. They were also invited to write down any additional comments on the vote card that they wished to share. See Figure 5 for example vote cards using during the taste panels. For the third and fourth rounds, participants were provided with the specific variety of each alternative as well as a brief description of each that mimicked the information one would normally find on a menu. At the conclusion of the four rounds, participants were asked to complete a short questionnaire that collected some additional information about the participants.

Consumer Taste Panels: Results

A total of 60, 31, and 78 individuals participated in the Point Clear, AL, Houston, TX, and Chicago, IL taste panels, respectively. During the blind rounds (Table 2), the relatively-

lower-priced generic Gulf oyster had the highest proportion of "most likely to buy" responses[3], whereas the Sewansecott Ocean Salts (an Atlantic variety from Virginia) had the lowest proportion of "most likely to buy" responses. The Point aux Pins oysters (a Gulf variety from Grand Bay, Alabama) had the highest proportion of "most likely to buy" responses among the branded oysters. Sewansecotts had the highest proportion of "least likely to buy" responses, whereas the Apalachicolas (a Gulf variety from Apalachicola, Florida) had the lowest proportion of "least likely to buy" responses. Switching to the labeled rounds, however, we see a shift in preferences. The local Point aux Pins oyster had the highest proportion of "most likely to buy" responses, whereas the James River oysters (an Atlantic variety from Chesapeake Bay, Virginia) had the lowest. In terms of "least likely to buy" responses, James River had the highest and Point aux Pins had the lowest.

Econometric regression analysis was conducted using a discrete-choice conditional logit model, assuming that respondents were utility maximizers. Specifically, we assume that a respondent chooses the oyster alternative that maximizes utility, where utility is a linear function of exogenous attributes. We use the "clogit" routine in NLOGIT 5.0 to estimate the regression models for the taste-panel data (Greene 2012). No statistical significance was found for the price parameter for any of the taste panel models. Thus, the regression results for the taste panel data can be examined for the purpose of identifying relative preferences for oyster alternatives, but not for the purpose of obtaining welfare measures (i.e., WTP).

[3] Note that the proportions reported are calculated as the frequency that a given oyster variety received a "most likely to buy" response divided by the total number of responses given for that oyster variety. Thus, proportions do not sum to unity down a column.

The results of the econometric analysis for the blind rounds for the Point Clear and Houston taste panels (Table 3) indicates that there were no significant differences between the base-case generic Gulf oyster and any of the branded oyster varieties. Additionally, Wald tests of pair-wise parameter equivalence indicate no significant differences between any of the non-generic oyster varieties, indicated by the same letter "a" in the column next to the parameter estimates. In other words, there were no statistical differences of any kind in terms of preferences between pairs of oyster varieties during these rounds. Marginal effects are also reported, and indicate the change in the probability of choosing a specified oyster relative to the base generic Gulf oyster. Thus, a panelist was 9% less likely to choose a Sewansecott oyster relative to the generic Gulf oyster.

For the labeled rounds, however, the econometric model indicates some statistical differences (Table 3). The James River oyster was statistically less likely (by 22%, as indicated by the marginal effects) to be chosen relative to the generic Gulf oyster, whereas the parameter on Point aux Pins oysters was significantly more likely (15%) to be chosen over the generic Gulf oyster. Additionally, Wald tests indicate some pairwise statistical differences among non-generic varieties: the probability of choosing the James River oyster is statistically lower than choosing any other branded oyster (indicated by the letter "c" which only the James River oyster has). Additionally, the probability of choosing the Point aux Pins oysters (with group classification "a") is statistically greater than that of Galveston Bay (a Gulf variety from Texas) and James River oysters (assigned group classification "b" or "c").

For the Houston taste panel, Champagne Bay (a Gulf variety from Louisiana) and Conway Royales (an Atlantic variety from Malpeque Bay, Prince Edward Island) tied for the highest proportion of "most likely to buy" responses during the blind rounds, whereas

Apalachicolas had the lowest. Apalachicolas also had the highest proportion of "least likely to buy" responses, whereas Onsets (an Atlantic variety from Buzzards Bay, Massachusetts) had the lowest. During the labeled rounds, however, we see some evidence of a shift in preferences. The Onsets had the highest proportion of "most likely to buy" responses (the local Lonesome Reef variety out of Galveston Bay, Texas, had the second-highest proportion), whereas the Apalachicolas had the lowest. The Champagne Bay oysters had the highest proportion of "least likely to buy" votes, whereas the Onsets had the lowest.

The results of the econometric analysis for the blind rounds indicates that only the Apalachicola oysters were statistically different from the base generic Gulf oyster, being 22% less-likely to be chosen. Wald tests indicate some pairwise statistical differences among branded varieties. The probability of choosing a Conway Royale oyster (assigned the letter "a") was significantly higher than that of an Apalachicola or Lost Reef oyster (assigned the letter "b"). Marginal effects indicate that panelists were 15% less likely to choose a Lost Reef oyster relative to the generic Gulf oyster.

For the labeled rounds, the econometric model indicates that both the Lost Reef and Onset oysters were statistically more likely (24% each) to be chosen relative to the generic Gulf oyster. Additionally, Wald tests indicate that the probability of choosing a Point aux Pins oyster (assigned the letter "b") was significantly lower than that of a Lost Reef oyster (assigned the letter "a").

For the Chicago taste panel, the Island Creek oysters (an Atlantic variety from Duxbury Bay, Massachusetts) received the highest proportion of "most likely to buy" responses during the blind rounds, whereas the Shigokus (a Pacific variety out of Willapa Bay, Washington) received the lowest (refer back to Table 2). Wiley Points (an Atlantic variety out of Damariscotta River,

Maine) received the highest proportion of "least likely to buy" responses, whereas Island Creeks received the lowest. During the labeled rounds, Wiley Points received the highest proportion of "most likely to buy" responses, whereas Grassy Points (a Gulf variety out of San Antonio Bay, Texas) received the lowest. Grassy Points received the highest proportion of "least likely to buy" responses, whereas Island Creeks received the lowest.

For the econometric analysis for the Chicago taste panel (Table 4), because the experimental design for this panel contained no generic Gulf oyster, we specified the Island Creek oyster as the omitted "base" variety, so the reported coefficients indicate how other oysters fared relative to the Island Creek oyster. During the blind rounds, only the Wiley Points were significantly less likely (11%) to be chosen relative to the Island Creeks. Additionally, Wald test results indicate that the probability of choosing both the Point aux Pins and Grassy Point oysters (assigned the letter "a") were statistically higher than that of choosing a Wiley Point oyster (assigned the letter "b").

During the labeled rounds, results indicate that the probability of choosing both the Grassy Points and Shigokus were statistically lower than that of the Island Creeks (13% and 12%, respectively). Wald tests indicate that the probabilities of choosing the 13-Mile (a Gulf variety out of Apalachicola Bay, Florida) and Wiley Point oysters (assigned the letter "a) were significantly higher than that of both the Grassy Points and Shigokus (assigned the letter "b").

Online Household Survey: Experimental Design

There were four separate designs based on two survey formats: the first was based on whether a generic Gulf oyster was included as one of the alternatives, and the second was based on the number of attributes included. Because generic Gulf oysters are the typical type of

oysters sold in the Gulf region, a survey was designed that included a generic Gulf oyster as a fixed third alternative. The design was constrained so that the generic Gulf oyster price was always less than the other branded alternatives offered in a given choice set. Because such oysters are not widely marketed, nor expected to be the one with the highest market potential, outside of the Gulf region, this survey design was administered to Gulf households only. An alternative survey design was administered that did not include the generic Gulf alternative, but rather included only branded oysters. This design was administered to both Gulf and non-Gulf (i.e., Atlantic coast, Pacific coast, and inland) respondents.

Regarding the number of attributes included, we constructed a "High-Information" design that included five attributes: oyster brand/name, price, size, saltiness level, and production method (wild or cultivated). We also constructed a "Low-Information" design that included only two attributes: oyster brand/name and price. These two treatments were used to reflect typical variations in restaurant menus as well as to test if preferences were sensitive to the quantity and/or type of information provided to consumers. It is possible that providing additional information regarding size, taste, and production method can mitigate the relative importance of the label / geographic origin of the oyster.

A total of thirteen oyster varieties were included in the design: seven Gulf varieties, including the "generic" Gulf oyster; three Atlantic varieties, and three Pacific varieties. Two of the Gulf varieties used were fictional, i.e., we are aware of no oysters that were marketed under these labels at the time of the survey: Bay St. Louis (Mississippi) and Portersville Bay (Alabama).[4] For the generic Gulf oyster only, size was described as "sizes vary" and saltiness

[4] There now exists a Portersville Bay Oyster Company.

was described as "saltiness varies" to reflect the true variation in size and saltiness found in a typical order of generic Gulf oysters. All other oyster varieties took on one of the specific levels (i.e., "small", "medium", or "large"; "sweet", "mildly salty", "salty").[5] Table 5 contains a summary of the attributes and their levels used in the online survey. All designs were optimized according to s-efficiency, and generated using NGene software (Choice Metrics 2012).

In addition to the choice experiment questions, we also elicited respondents' perceived food-safety and seafood quality ratings for individual water bodies throughout the U.S. where oysters are harvested. Specifically, we asked respondents to:

> *Please rate what you perceive to be the overall quality of raw oysters on the half-shell from the following places, where a 1 is Poor and a 10 is Excellent.*

We also asked respondents to:

> *Please rate what you perceive to be the overall level of food safety of seafood in general from the following places, where a 1 is Poor and a 10 is Excellent.*

The GfK Group (an online survey firm, formerly Knowledge Networks) administered the survey in April and November 2013 to a sample of respondents participating in their KnowledgePanel®. The target population consisted of general-population adults age 18+ who were English language survey takers in one of the pre-identified markets, and who indicated that they consumed raw oysters on the half-shell at least once per year. Select U.S. metro areas were

[5] Exceptions to this were to reflect the true constraints on the characteristics of particular oyster varieties: the production method of Point aux Pins was fixed at "Cultivated" and the saltiness level of Hood Canal oysters was constrained to be either "mildly salty" or "salty".

identified by the authors as being key markets for raw oyster consumption. Table 6 contains the distribution of respondents from specific metro areas that were included in the sample.

Online Household Survey: Results

Quality and Seafood Safety Ratings

Table 7 contains the mean oyster quality and seafood safety ratings and proportion of "Don't Know" responses among Gulf and non-Gulf respondents, respectively. The proportion of "Don't Know" responses gives some indication of the relative knowledge of the sample regarding specific locations. Regarding oyster quality ratings, Gulf respondents tended to give the highest ratings to Apalachicola Bay, Florida; Coastal Louisiana; Cape Cod, Massachusetts; and Chesapeake Bay, Virginia; and the lowest ratings to Long Island Sound, New York. Long Island Sound was rated lower than all other locations, although Gulf respondents rated all other Atlantic locations higher than Pacific locations. Gulf respondents tended to rate the seafood safety of Atlantic locations highest (with the exception of Long Island Sound), and rated Pacific locations as high as or higher than Gulf locations. As with the quality ratings, Apalachicola Bay and Coastal Louisiana fared better relative to other Gulf locations.

Non-Gulf respondents tended to rate the quality of oysters from Cape Cod the highest and those from all Gulf locations (except for Coastal Louisiana) the lowest. With only a few exceptions, these respondents rated all Atlantic and Pacific locations higher than all Gulf locations. Non-Gulf respondents tended to rate the seafood safety of Cape Cod and Puget Sound, Washington highest, followed by other Atlantic and Pacific locations, with Gulf locations receiving the lowest ratings. Again, Apalachicola Bay and Coastal Louisiana fared better than the other Gulf locations.

Choice Experiment: Raw Responses

Table 8 contains the proportion of "most likely to buy" and "least likely to buy" votes for each oyster variety under each treatment. Among Gulf respondents, when Champagne Bay (a Gulf variety out of Louisiana) oysters were offered in the low-information treatment, they were voted as "most likely to buy" 54% of the time, whereas Hood Canal (a Pacific variety out of Washington) oysters were voted such only 14% of the time. In the high-information treatment, Bay Saint Louis (a Gulf variety out of Mississippi) oysters were voted "most likely to buy" 61% of the time, whereas Moonstones (an Atlantic variety out of Point Judith Pond, Rhode Island) were voted such only 16% of the time.

Among Non-Gulf respondents, when Moonstones were offered during the low-information treatment, they were voted "most likely to buy" 67% of the time, whereas Point aux Pins oysters (a Gulf variety out of Grand Bay, Alabama) were voted such only 20% of the time. For the high-information treatment, Non-Gulf respondents voted Chesapeake Bay oysters (an Atlantic variety out of Virginia) "most likely to buy" 47% of the time, whereas they voted Point aux Pins as such 27% of the time.

In the Generic Treatment, which was administered to Gulf respondents only, the generic Gulf of Mexico oyster had the highest proportion of "most likely to buy" votes (45% and 53%, respectively), whereas Point aux Pins had the lowest such proportion, and these results were consistent across information treatments. Chesapeake Bay and Cape Cod had the highest proportion of "least likely to buy" votes in both information treatments (48% and 63%, respectively).

Choice Experiment: Regression Models

As before, utility was specified as a linear function of the alternative-specific attributes, which for the low-information treatments included oyster variety and price per half-dozen, and for the high-information treatment, included the previous two plus size (small, medium, or large), saltiness level (sweet, mildly salty, or salty), and production method (wild-caught or cultivated). Price was specified as a continuous variable whereas all others were specified as discrete indicator variables. Following Carson and Czajkowski (2013), the coefficient on price is exponentiated, the effect of which is that the support of the price parameter is restricted to be in the positive domain and the resulting ratios of attribute parameters and the price parameter will have well-defined moments. Willingness to pay for a marginal increase in a given attribute is equal to the ratio of the associated coefficient and the exponential of the price coefficient. All regression models for the online survey data were estimated using NLOGIT's "rplogit" routine (Greene 2012).

Non-generic Treatment

Table 9 contains the results of the econometric regression models for choice sets that include only branded oysters (i.e., the "Non-generic" treatment). We specified the Chesapeake Bay oyster as the omitted "base" variety, so the reported coefficients indicate relative preferences for all other oyster varieties relative to the Chesapeake Bay oyster.

Considering first Gulf respondents under the low-information treatment, price was significant and negative as expected. Only the Hood Canal oysters were statistically different from the base Chesapeake Bay oysters, being 12% less likely to be chosen (as indicated by the marginal effect). No differences were found for the other oysters' varieties. Additionally, Wald

test results indicate that the probabilities of choosing Apalachicola Bay (a Gulf variety out of Florida), Champagne Bay, Lonesome Reef (a Gulf variety out of Galveston Bay, Texas), Point aux Pins, and Cape Cod (an Atlantic variety out of Massachusetts) (assigned the letter "a") are statistically higher than those of choosing Portersville Bay (a Gulf variety out of Alabama), Hood Canal, and Netarts Bay (a Pacific variety out of Oregon) (assigned the letters "b" and/or "c").

For the high-information treatment, price was significant with the negative sign as expected. None of the additional oyster attributes – size, saltiness, and production method – appear to have had any significant effect on choice for this sample. Additionally, no individual oyster was significantly different from the base Chesapeake Bay oyster. The Wald test results, however, indicate that the Bay Saint Louis oyster (assigned the letter "a") was significantly more likely to be chosen than the Netarts Bay and Point aux Pins oysters (assigned the letters "b" and/or "c"), and the Champagne Bay oyster was significantly more likely to be chosen over the Point aux Pins oyster.

Considering now non-Gulf respondents under the low-information treatment, price was significant and negative as expected. All the oysters parameters estimated are negative and statistically different from zero, except for those of Willipa Bay (a Pacific variety out of Washington), Cape Cod, and Moonstones, indicating that all except these three were significantly less likely to be chosen relative to the Chesapeake Bay oyster (ranging from 10-19%). The Moonstones were significantly more likely to be chosen, and the Willapa Bay and Cape Cods were not statistically different than the Chesapeake Bay oysters. Wald tests indicate that, in addition to being less likely to be chosen relative to the Chesapeake Bay oysters, all other

oysters were also significantly less likely to be chosen relative to Moonstones, and all except Willapa Bay were less likely to be chosen relative to Cape Cod oysters as well.

In the high-information treatment, the price coefficient was also significant and negative. Small-sized oysters were significantly less likely (specifically, 9% less likely) to be chosen relative to the base medium-sized alternatives, salty oysters were significantly less likely (10%) to be chosen relative to the base "mildly salty" alternatives, and wild-caught oysters were significantly more likely (6%) to be chosen relative to farm-raised alternatives. All Gulf varieties were significantly less likely (between 9% and 15%) to be chosen relative to the base Chesapeake Bay oyster. Additionally, based on Walt test results, Gulf varieties were significantly less likely to be chosen relative to the non-Gulf varieties, although the Champagne Bay and Point aux Pins oysters were in the same statistical group ("b") as all but one (Moonstones) of the non-Gulf varieties.

Generic Treatment

Table 10 contains the results of the econometric regression analysis for choice sets including the generic Gulf oyster (i.e., the "Generic" treatment), which was administered to Gulf respondents only. For generic choice sets only, there are two additional terms in utility. It was necessary to control for differences in the scale of the variance of the alternatives given the inherent difference in the generic Gulf oyster alternative (which was fixed as alternative "C" in all generic choice sets) relative to the named oyster alternatives (alternatives A and B). This difference amounts to a violation of the assumption of Independence from Irrelevant Alternatives. It was also necessary to control for intercept effects due to the decomposition of the choice sets into "first-best" and "second-best" best-worst elicitation choice sets. We

addressed these issues, respectively, by including a zero-mean alternative-specific normally-distributed random term ω that equaled 1 for alternatives A and B and zero otherwise; and a binary indicator term δ that equaled 1 for "first best" choice sets and zero otherwise.

For these models, the generic Gulf oyster served as the omitted base variety. In the low-information treatment, price was significant and negative as expected. Results indicate that all oyster varieties were significantly less likely to be chosen relative to the base generic Gulf oyster, with the Hood Canal oyster having the greatest marginal effect (21% less likely than the generic Gulf oyster). Also, Wald tests indicate that the Champagne bay oyster (assigned the letter "a") was significantly more likely to be chosen over all varieties except Apalachicola Bay and Chesapeake Bay (also assigned the letter "a").

In the high-information treatment, the price coefficient is significant and negative as expected. Small-sized oysters were significantly less likely (6%) to be chosen, and wild-caught oysters were more significantly more likely (6%) to be chosen. As for oyster varieties, all were significantly less likely to be chosen relative to the generic Gulf oyster except for Apalachicola Bay and Bay Saint Louis. Cape Cod oysters have the greatest negative effect (22% less likely to be chosen relative to the generic Gulf of Mexico oyster). Wald test results indicate that Apalachicola Bay and Bay Saint Louis oysters (assigned the letter "a") were significantly more likely to be chosen over Point aux Pins, Hood Canal, Cape Cod, and Chesapeake Bay oysters (assigned the letters "b", "c", and/or "d").

Choice Experiment: Welfare Estimates

Non-generic Treatment

Table 11 contains the mean (and 95% confidence interval) maximum willingness to pay a premium for a given oyster variety over and above the price of the Chesapeake Bay oyster based on the Non-generic treatment results. For reference, all branded oysters averaged $13 per half-dozen in the survey. These estimates are derived from the results of the Non-generic treatments. The reader is cautioned that although dollar values are reported for all oyster varieties, only the effect of the Hood Canal oyster was significant in the low-information treatment model. Because the effects of the remaining oyster labels were not statistically significant, their estimated price premia tend very close to $0 with very wide confidence intervals. For the Hood Canal oyster, results indicate a mean price *discount* (i.e., negative premium) of $4 per half-dozen, with an associated 95% confidence interval ranging from a $8.38 price discount to a $0.39 premium. No oyster effects were significant in the high-information treatment, and as above, their estimated price premia strongly overlap $0 and tend to have very wide confidence intervals.

Among Non-Gulf respondents, and in the low information treatment, results indicate that most oysters face a price discount, with the greatest discounts associated with Gulf oyster varieties (ranging from $3.67 to $7.58 price discount per half-dozen). In the high-information treatment, similar results are found, but with slightly higher price discounts for Gulf varieties. The attributes “size” and “saltiness” also present a price discount while the attribute “wild” has a mean WTP a premium of $2.92 per half-dozen relative to the base cultivated oysters.

Generic Treatment

Table 12 contains the mean (and 95% confidence interval) maximum willingness to pay a premium for a given branded oyster variety over and above the price of a generic Gulf of Mexico

oyster, based on the Generic treatment results. For reference, generic Gulf of Mexico oysters averaged $9 per half-dozen in the survey. In the low-information treatment, results indicate the largest mean price premium on Gulf varieties was for the Champagne Bay oysters ($5.36 per half-dozen), whereas the smallest was for the Portersville Bay oysters ($0.29). There was a slight price discount associated with the Hood Canal oyster (-$0.57). In the high-information treatment, the largest price premium was associated with Apalachicola Bay oysters ($5.43 per half-dozen), which the Point aux Pins oysters has a mean premium of $2.07 per half-dozen. Price discounts were found for Hood Canal and Cape Cod oysters. Small-sized oysters faced an estimated mean price discount of $1.97, whereas wild-caught oysters have an estimated mean price premium of $1.97.

Summary and Conclusions

The key findings of this study are as follows. Results of the two Gulf Coast taste panels indicate that, when labeled, local branded varieties dominate consumer choice, although these same varieties fare no better than other varieties under blind taste-tests. During the Chicago taste panels, labeling also had strong effects. Under blind taste tests, branded Gulf varieties fared as well as other varieties, but when labeled, some - but not all - Gulf varieties were less-frequently chosen as “best” or “second-best”.

During the online survey, Gulf respondents tended to perceive the quality of oysters and overall seafood safety of Apalachicola Bay and Coastal Louisiana higher than that of other Gulf, Atlantic, and Pacific water bodies. Non-Gulf respondents tended to perceive the associated quality of oysters and seafood safety of Gulf water bodies as worse than that of Atlantic and Pacific locations, although Apalachicola Bay and Coastal Louisiana fared relatively better. On

the other hand, there were higher frequencies of "I don't know" responses to the quality and safety questions of Gulf water bodies from Non-Gulf respondents, indicating that consumers from these markets are more likely to have no or less-well-formed opinions on Gulf oysters.

Results from the Non-generic treatment indicate that Non-Gulf respondents preferred Atlantic and Pacific oysters relative to Gulf oysters. However, in the presence of additional information regarding the oyster alternatives (namely, information on size, taste, and production method), the negative preferences toward Gulf oysters was mitigated somewhat. Additionally, the attributes size, taste, production method were significant in their own right among Non-Gulf respondents, with wild-caught alternatives being preferred to farm-raised ones. Results from the Generic treatment indicate that Gulf respondents chose the generic Gulf oyster a plurality or majority of the time over branded varieties. In this treatment, size and production method were significant factors, with wild-caught alternatives being preferred to farm-raised ones.

In terms of willingness to pay a premium for branded Gulf varieties, our results indicate that Non-Gulf respondents are likely to require a price discount relative to local varieties, on the order of $3-9 per half-dozen. Using the mean branded variety price of $13 per half-dozen used during the choice experiment, that implies that Gulf varieties might sell retail at $4-10 per half-dozen in Non-Gulf markets, depending on the specific variety and other factors.[6] For example, results indicate that wild-caught oysters may fetch a $3 per half-dozen premium over farm-raised

[6] As of September 2, 2015, branded oyster varieties were selling at the following prices per half-dozen at the following Atlantic and Pacific Coast restaurants: Island Creek Oyster Bar (Boston), $15-21; Grand Central Oyster Bar (New York), $12.90-22.50; Shaw's Crab House (Chicago), $18; Elliott's Oyster House (Seattle), $16.50-21.

oysters independent of the brand. It is important to stress, however, the fairly wide confidence intervals on these estimates, indicating that the true price premia may lie far beyond the levels indicated by the means here.

Although most Gulf respondents chose the cheaper generic Gulf oyster during the Generic treatments, we still estimate positive price premia for branded varieties on the order of $0-5 per half-dozen. Using the mean price $9 per half-dozen for generic Gulf oysters as used in the choice experiment, there is implied a retail price of $9-14 per half-dozen for branded Gulf varieties.[7] The same caveat about taking into account the wide confidence intervals around these means applies here as well.

We wish to speak briefly about two issues specific to Gulf oysters that may influence preferences. These are any perceived effects regarding of the 2010 Deepwater Horizon oil spill and that of *Vibrio vulnificus*. Although we did not elicit any responses specific to these two issues, we did include an open-ended question immediately following the choice experiment, food-safety ratings, and quality ratings questions that asked: *"While answering the previous questions, did you have any particular concerns about any of the oysters that had a big influence on your choices?"* Although most respondents typically opt-out of leaving comments (in the present survey, 46% of all respondents left it completely blank and another 14% said some variant of "no"), we conducted a keyword search for the following terms: "oil", "BP", "spill",

[7] As of September 2, 2015, (generic) Gulf oysters were selling at the following prices per half-dozen at the following Gulf Coast restaurants: Liberty Kitchen & Oyster Bar (Houston), $10.25; Felix's (New Orleans), $8.75; Wintzell's Oyster House (Mobile), $9.99; Atlas Oyster House (Pensacola), $6.95; The Oyster Bar (Tampa Bay), $9.

"Deepwater", "Vibrio", and "bacteria". One of the oil-related terms appeared 40 times (23 times among Gulf respondents and 17 times among non-Gulf respondents), while a *Vibrio*-related term appeared 5 times (4 times among Gulf respondents and once among non-Gulf respondents). It is an open question as to whether the frequency of oil-related comments are of concern or not. Forty is just over 5% of the total number of respondents, but 14% when limited to those respondents who left a comment of some kind.

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Table 1. Oyster varieties tested at each taste panel.

Point Clear, Alabama (Grand Hotel Marriott Resort)	*Gulf Coast*: Apalachicola Bay (Florida), Champagne Bay (Louisiana), Lonesome Reef (Galveston Bay, Texas), Point aux Pins (Grand Bay, Alabama), Gulf of Mexico (Generic) *Atlantic Coast*: James River (Chesapeake Bay, Virginia), Sewansecott Ocean Salts (Virginia)
Houston, Texas (Reef)	*Gulf Coast*: Apalachicola Bay (Florida), Champagne Bay (Louisiana), Lost Reef (Galveston Bay, Texas), Point aux Pins (Grand Bay, Alabama), Gulf of Mexico (Generic) *Atlantic Coast*: Conway Royale (Malpeque Bay, Prince Edward Island), Onset (Buzzards Bay, Massachusetts)
Chicago, Illinois (Shaw's Crab House))	*Gulf Coast*: 13 Miles (Apalachicola Bay, Florida), Grassy Point (San Antonio Bay, Texas), Point aux Pins (Grand Bay, Alabama) *Atlantic Coast*: Island Creek (Duxbury Bay, Massachusetts), Wiley Point (Damariscotta River, Maine) *Pacific Coast:* Shigoku (Willapa Bay, Washington)

Table 2. Proportion of votes by oyster variety during the taste panel.

	Point Clear, Alabama				*Houston, Texas*				*Chicago, Illinois*			
	Blind		*Labeled*		*Blind*		*Labeled*		*Blind*		*Labeled*	
Oyster Variety	**Most Likely to buy**	**Least Likely to buy**	**Most Likely to buy**	**Least Likely to buy**	**Most Likely to buy**	**Least Likely to buy**	**Most Likely to buy**	**Least Likely to buy**	**Most Likely to buy**	**Least Likely to buy**	**Most Likely to buy**	**Least Likely to buy**
Apalachicola Bay	26%	21%	53%	33%	0%	50%	18%	18%	28%	32%	35%	30%
Champagne Bay	33%	36%	53%	29%	43%	29%	24%	64%				
Grassy Point									42%	33%	18%	49%
Lonesome Reef	29%	39%	22%	36%	38%	42%	53%	16%				
Point aux Pins	39%	39%	60%	17%	15%	46%	28%	61%	31%	24%	26%	31%
Gulf of Mexico (generic)	42%	29%	37%	23%	40%	34%	30%	30%				
Conway Royale					43%	19%						
Island Creek									55%	17%	39%	22%
James River			6%	65%								
Onset					38%	13%	55%	5%				
Sewansecott Ocean Salts	21%	41%	14%	43%								
Wiley Point									24%	48%	45%	34%
Shigoku									21%	46%	39%	41%
N =	60				31				78			

Note that the proportions reported are calculated as the frequency that a given oyster variety received a "most likely to buy" response divided by the total number of responses given for that oyster variety. Thus, proportions do not sum to unity down a column.

Table 3. Regression results for Point Clear and Houston taste panels. Omitted Base: generic Gulf oyster

	Point Clear, Alabama				*Houston, Texas*			
	Blind		*Labeled*		*Blind*		*Labeled*	
	Coefficient (Std. Err.)	**Marginal Effects**	**Coefficient (Std. Err.)**	**Marginal Effects**	**Coefficient (Std. Err.)**	**Marginal Effects**	**Coefficient (Std. Err.)**	**Marginal Effects**
Price	0.05		-0.02		-0.05		0.11	
	(0.05)		(0.06)		(0.09)		(0.07)	
Apalachicola Bay	0.20 [a]	0.05	0.06[ab]	0.012	-1.34* [b]	-0.22	0.47 [ab]	0.11
	(0.31)		(0.50)		(0.72)		(0.41)	
Champagne Bay	0.017 [a]	0.00	-0.25[ab]	-0.05	0.48 [ab]	0.11	0.012 [ab]	0.003
	(0.40)		(0.44)		(0.66)		(0.61)	
Galveston Bay	-0.08 [a]	-0.02	-0.45[b]	-0.09	-0.83 [b]	-0.15	1.00** [a]	0.24
	(0.35)		(0.44)		(0.63)		(0.48)	
Point aux Pins	-0.11[a]	-0.02	0.62*[a]	0.15	-0.61 [ab]	-0.12	-0.25 [b]	-0.05
	(0.33)		(0.34)		(0.46)		(0.50)	
Conway Royale					0.22 [a]	0.05		
					(0.56)			
James River			-1.34***[c]	-0.22				
			(0.47)					
Onset					0.20 [ab]	0.05	0.98** [ab]	0.24
					(0.65)		(0.48)	
Sewansecott	-0.42 [a]	-0.09	-0.19[ab]	-0.04				
	(0.35)		(0.50)					
N =	216		215		109		115	
LL =	-165.94		-149.92		-8.36		-83.35	

***, **, * significance at 1%, 5%, 10% level.

a, b, c indicate like groups. An oyster variety assigned a particular letter(s) is not significantly different at the 95% confidence level from that of all other varieties assigned the same letter(s).

Table 4. Regression results for Chicago taste panel. Omitted Base: Island Creek oyster

	Chicago, Illinois			
	Blind		*Labeled*	
	Coefficient (Std. Err.)	**Marginal Effects**	**Coefficient (Std. Err.)**	**Marginal Effects**
Price	0.005		-0.04	
	(0.03)		(0.03)	
13 Miles	-0.17 [ab]	-0.04	0.05 [a]	0.01
	(0.24)		(0.24)	
Point aux Pins	0.14 [a]	0.03	-0.17 [ab]	-0.04
	(0.23)		(0.22)	
Grassy Point	0.18 [a]	0.04	-0.66*** [b]	-0.13
	(0.24)		(0.25)	
Wiley Point	-0.53** [b]	-0.11	0.11 [a]	0.02
	(0.24)		(0.24)	
Shigoku	-0.34 [ab]	-0.07	-0.59** [b]	-0.12
	(0.25)		(0.26)	
N =	302		302	
LL =	-253.59		-253.59	

***, **, * significance at 1%, 5%, 10% level.

a, b indicate like groups. An oyster variety assigned a particular letter(s) is not significantly different at the 95% confidence level from that of all other varieties assigned the same letter(s).

Table 5. Attributes and their levels used in the online survey experimental design. The low-information treatment included only the oyster variety and price per half-dozen.

Oyster Varieties	*Gulf Coast*: Apalachicola Bay (Florida), Bay St. Louis (Mississippi), Champagne Bay (Louisiana), Lonesome Reef (Galveston Bay, Texas), Point aux Pins (Grand Bay, Alabama), Portersville Bay (Alabama), Gulf of Mexico (generic) *Atlantic Coast*: Cape Cod (Massachusetts), Chesapeake Bay (Virginia), Moonstones (Point Judith Pond, Rhode Island) *Pacific Coast*: Hood Canal (Washington), Netarts Bay (Oregon), Willapa Bay (Washington)
Production Method	Cultivated, Wild
Size	small, medium, large, sizes vary*
Saltiness	sweet, mildly salty, salty, saltiness varies*
Price per half-dozen	$7*, 8, 9*, 10, 11*, 12, 14, 16, 18

* Applies to generic Gulf oyster only

Table 6. Frequency of respondents to online survey by market area.

Sample	*Gulf Respondents*				*Non-Gulf Respondents*	
Choice Set Treatment	*Non-Generic*		*Generic*		*Non-Generic*	
Information Treatment	*Low*	*High*	*Low*	*High*	*Low*	*High*
Atlanta-Sandy Springs-Marietta, GA	20	10	48	26		
Baltimore-Towson, MD					4	11
Baton Rouge, LA	1	1	7	5		
Boston-Cambridge-Quincy, MA-NH					8	10
Charleston-North Charleston, SC		2	5	3	5	8
Chicago-Naperville-Joliet, IL-IN-WI					13	17
Houston-Baytown-Sugar Land, TX	9	8	42	28		
Jacksonville, FL	6	1	14	7		
Las Vegas-Paradise, NV					5	6
Miami-Fort Lauderdale-Miami Beach, FL	8	6	38	32		
Mobile, AL	1	1	1	1		
New Orleans-Metairie-Kenner, LA	4	2	17	12		
New York-Newark-Edison, NY-NJ-PA					38	51
Portland-South Portland, ME					1	
St. Louis, MO-IL					9	9
San Francisco-Oakland-Fremont, CA					10	17
Seattle-Tacoma-Bellevue, WA					4	11
Tallahassee, FL		1	6	4		
Tampa-St. Petersburg-Clearwater, FL	7	16	27	28		
Washington-Arlington-Alexandria, DC-VA					19	19
Total	**56**	**48**	**205**	**146**	**116**	**159**

Table 7. Mean ratings of perceived oyster quality and seafood safety of oyster-harvest bodies of water. Ratings are from 1 (poor) to 10 (excellent). Proportion of "don't know" responses also reported.

	Perceived Oyster Quality Rating				***Perceived Seafood Safety Rating***			
	Gulf Respondents		*Non-Gulf Respondents*		*Gulf Respondents*		*Non-Gulf Respondents*	
Location	**Mean Rating**	**Don't Know**	**Mean Rating**	**Don't Know**	**Mean Rating**	**Don't Know**	**Mean Rating**	**Don't Know**
Apalachicola Bay, Florida	7.2	19%	5.7	33%	7.3	26%	6.1	38%
Coastal Louisiana	7.3	18%	6.5	23%	7.1	24%	6.2	28%
Galveston Bay, Texas	6.6	26%	5.4	31%	6.6	28%	5.6	36%
Mississippi Sound, Mississippi	6.6	27%	5.7	29%	6.8	30%	5.8	34%
Mobile Bay, Alabama	6.7	25%	5.6	28%	6.8	28%	5.6	35%
Gulf of Mexico	6.9	14%	5.5	26%	6.7	21%	5.3	28%
Cape Cod, Massachusetts	7.3	28%	7.8	17%	7.6	33%	7.7	22%
Chesapeake Bay, Virginia	7.2	26%	7.3	18%	7.4	32%	7.3	24%
Long Island Sound, New York	5.8	37%	6.2	19%	6.4	39%	6.3	25%
Coastal Northern California	6.3	37%	6.7	26%	6.9	41%	7.2	29%
Coastal Oregon	6.5	37%	7.2	26%	7.2	39%	7.4	30%
Puget Sound, Washington	6.8	36%	7.2	25%	7.1	40%	7.6	29%

Table 8. Proportion of votes by oyster variety by treatment in online survey.

	Non-Generic Treatment								*Generic Treatment*			
	Gulf Respondents				*Non-Gulf Respondents*				*(Gulf Respondents only)*			
	Low Information		*High information*		*Low Information*		*High information*		*Low Information*		*High information*	
Oyster Variety	**Most Likely to Buy**	**Least Likely to Buy**	**Most Likely to Buy**	**Least Likely to Buy**	**Most Likely to Buy**	**Least Likely to Buy**	**Most Likely to Buy**	**Least Likely to Buy**	**Most Likely to Buy**	**Least Likely to Buy**	**Most Likely to Buy**	**Least Likely to Buy**
Apalachicola Bay	47%	33%	50%	25%	27%	41%	32%	31%	39%	30%	39%	28%
Bay Saint Louis	40%	27%	61%	25%	25%	36%	29%	41%	31%	31%	21%	34%
Champagne Bay	54%	25%	39%	21%	32%	32%	33%	30%	33%	19%	34%	20%
Lonesome Reef	45%	22%	47%	28%	31%	33%	39%	28%	25%	30%	27%	34%
Point aux Pins	41%	19%	24%	46%	20%	35%	27%	32%	19%	39%	17%	50%
Portersville Bay	27%	37%	27%	27%	31%	35%	29%	34%	22%	39%		
Hood Canal	14%	66%	20%	40%	20%	50%	30%	35%	22%	31%	31%	35%
Netarts Bay	26%	30%	40%	32%	45%	20%	35%	25%				
Willapa Bay	25%	22%	34%	36%	40%	31%	36%	36%				
Cape Cod	31%	35%	26%	35%	42%	32%	36%	35%			18%	63%
Chesapeake Bay	27%	58%	38%	43%	37%	40%	47%	27%	33%	48%	25%	35%
Moonstones	31%	16%	16%	37%	67%	12%	31%	42%				
Gulf of Mexico (generic)									45%	33%	53%	21%

Table 9. Logit regression estimation results for Non-generic treatment.

	Gulf Respondents				*Non-Gulf Respondents*			
	Low Information		*High Information*		*Low Information*		*High Information*	
	Coef. (s.e.)	**Marg. Eff.**	**Coef. (s.e.)**	**Marg. Eff.**	**Coef. (s.e.)**	**Marg. Eff.**	**Coef. (s.e.)**	**Marg. Eff.**
Price	-1.86***		-2.76***	0.02	-1.97***		-2.46***	
	(0.17)		(0.60)		(0.12)		(0.19)	
Apalachicola Bay	0.32 [a]	0.07	0.10 [abc]	0.13	-0.96*** [f]	-0.17	-0.56*** [cde]	-0.11
	(0.33)		(0.42)		(0.21)		(0.19)	
Bay Saint Louis	0.02 [ab]	0.00	0.56 [a]	0.08	-0.85*** [def]	-0.16	-0.80*** [e]	-0.15
	(0.33)		(0.43)		(0.21)		(0.19)	
Champagne Bay	0.51 [a]	0.12	0.36 [ab]	0.03	-0.51** [cd]	-0.10	-0.51*** [bcd]	-0.10
	(0.33)		(0.41)		(0.20)		(0.19)	
Lonesome Reef	0.30 [a]	0.07	0.14 [abc]	-0.08	-0.87*** [ef]	-0.16	-0.61*** [cde]	-0.12
	(0.37)		(0.41)		(0.22)		(0.20)	
Point aux Pins	0.27 [a]	0.06	-0.38 [c]	-0.01	-1.06*** [f]	-0.19	-0.46** [bcd]	-0.09
	(0.37)		(0.42)		(0.23)		(0.19)	
Portersville Bay	-0.61 [c]	-0.12	-0.06 [abc]	-0.01	-0.98*** [ef]	-0.17	-0.70*** [de]	-0.13
	(0.40)		(0.39)		(0.24)		(0.17)	
Hood Canal	-0.62* [c]	-0.12	-0.03 [abc]	-0.02	-0.61*** [cdef]	-0.12	-0.24 [abc]	-0.05
	(0.34)		(0.38)		(0.20)		(0.17)	
Netarts Bay	-0.47 [bc]	-0.10	-0.10 [bc]	0.01	-0.62*** [cde]	-0.12	-0.31 [abc]	-0.06
	(0.35)		(0.45)		(0.22)		(0.20)	
Willapa Bay	0.21 [ab]	0.05	0.05 [abc]	0.03	-0.19 [bc]	-0.04	-0.14 [ab]	-0.03
	(0.36)		(0.35)		(0.20)		(0.16)	
Cape Cod	0.27 [a]	0.06	0.12 [abc]	0.02	0.09 [ab]	0.02	-0.24 [abc]	-0.05
	(0.33)		(0.34)		(0.21)		(0.15)	
Moonstones	0.02 [abc]	0.00	0.10 [abc]	-0.00	0.48* [a]	0.11	0.06 [a]	0.01
	(0.41)		(0.43)		(0.28)		(0.20)	
Small size			-0.001	-0.02			-0.42***	-0.09
			(0.18)				(0.09)	
Large size			-0.10	0.06			-0.09	-0.02
			(0.16)				(0.08)	
Sweet			0.27	0.03			0.03	0.01
			(0.24)				(0.11)	
Salty			0.13	0.04			-0.50***	-0.10
			(0.19)				(0.09)	
Wild			0.19	0.02			0.25***	0.06
			(0.17)				(0.08)	
N =	594		465		1199		1738	
LL =	-482.29		-402.78		-1000.09		-1479.71	

***, **, * significance at 1%, 5%, 10% level.

a, b, c, e, f indicate like groups. An oyster variety assigned a particular letter(s) is not significantly different at the 95% confidence level from that of all other varieties with the same letter(s).

Table 10. Logit regression estimation results for Generic treatment.

	Low Information		*High Information*	
	Coef. (s.e.)	**Marg. Eff.**	**Coef. (s.e.)**	**Marg. Eff.**
Price	-2.01***		-1.95***	
	(0.11)		(0.21)	
Apalachicola Bay	-0.72***[ab]	-0.14	-0.51[a]	-0.10
	(0.21)		(0.31)	
Bay Saint Louis	-0.85***[b]	-0.16	-0.53[a]	-0.11
	(0.21)		(0.34)	
Champagne Bay	-0.49**[a]	-0.10	-0.68*[ab]	-0.13
	(0.21)		(0.32)	
Lonesome Reef	-0.97***[bc]	-0.17	-0.70**[ab]	-0.13
	(0.21)		(0.32)	
Point aux Pins	-1.05***[bcd]	-0.18	-0.98***[bcd]	-0.18
	(0.22)		(0.33)	
Portersville Bay	-1.17***[cd]	-0.20		
	(0.21)			
Hood Canal	-1.28***[d]	-0.21	-1.08***[cd]	-0.19
	(0.21)		(0.28)	
Cape Cod			-1.37***[d]	-0.22
			(0.37)	
Chesapeake Bay	-0.68***[ab]	-0.13	-0.93***[bc]	-0.17
	(0.23)		(0.31)	
Small size			-0.28**	-0.06
			(0.12)	
Large size			0.03	0.007
			(0.12)	
Sweet			0.00013	0.00003
			(0.12)	
Salty			0.09	0.02
			(0.12)	
Wild			0.28***	0.06
			(0.11)	
ω	1.02		1.20*	
	(0.65)		(0.66)	
δ	1.01***		0.67***	
	(0.13)		(0.17)	
N =	2301		1598	
LL =	1942.84		-1308.10	

***, **, * significance at 1%, 5%, 10% level.

a, b, c, d indicate like groups. An oyster variety assigned a particular letter(s) is not significantly different at the 95% confidence level from that of all other varieties with the same letter(s).

Table 11. Estimated willingness to pay a premium over and above price of a Chesapeake Bay oyster, Non-generic treatments. Amounts are in dollar premium per half-dozen oysters.

	Gulf Respondents		*Non-Gulf Respondents*	
	Low Information **Mean Premium (95% C.I.)**	*High Information* **Mean Premium (95% C.I.)**	*Low Information* **Mean Premium (95% C.I.)**	*High Information* **Mean Premium (95% C.I.)**
Apalachicola Bay	$2.03	$1.60	-$6.85	-$6.52
	(-$2.45, $6.52)	(-$12.27, $15.46)	(-$9.43, -$4.27)	(-$10.29, -$2.74)
Bay Saint Louis	$0.12	$8.87	-$6.08	-$9.30
	(-$4.05, $4.28)	(-$11.69, $29.43)	(-$8.80, -$3.37)	(-$13.36, -$5.25)
Champagne Bay	$3.27	$5.63	-$3.67	-$5.98
	(-$1.39, $7.92)	(-$11.23, $22.50)	(-$6.25, -$1.09)	(-$9.84, -$2.12)
Lonesome Reef	$1.94	$2.20	-$6.20	-$7.16
	(-$3.07, $6.96)	(-$12.10, $16.50)	(-$8.86, -$3.53)	(-$11.06, -$3.26)
Point aux Pins	$1.76	-$6.02	-$7.58	-$5.40
	(-$3.24, $6.76)	(-$18.25, $6.21)	(-$10.38, -$4.78)	(-$9.25, -$1.54)
Portersville Bay	-$3.88	-$0.90	-$6.99	-$8.14
	(-$8.34, $0.59)	(-$12.53, $10.72)	(-$9.89, -$4.09)	(-$11.65, -$4.64)
Hood Canal	-$4.00	-$0.47	-$4.39	-$2.82
	(-$8.38, $0.39)	(-$12.37, $11.42)	(-$7.29, -$1.49)	(-$6.81, $1.17)
Netarts Bay	-$3.01	-$1.60	-$4.40	-$3.58
	(-$6.84, $0.81)	(-$14.40, $11.19)	(-$6.91, -$1.90)	(-$7.48, $0.31)
Willapa Bay	$1.33	$0.75	-$1.36	-$1.66
	(-$3.29, $5.96)	(-$10.01, $11.51)	(-$4.17, $1.45)	(-$5.43, $2.11)
Cape Cod	$1.73	$1.82	$0.65	-$2.82
	(-$2.61, $6.08)	(-$8.62, $12.26)	(-$2.40, $3.70)	(-$6.49, $0.86)
Moonstones	$0.11	$1.54	$3.43	$0.68
	(-$5.02, $5.24)	(-$11.92, $15.00)	(-$0.81, $7.67)	(-$3.83, $5.18)
Small size†		-$0.02		-$4.95
		(-$5.73, $5.69)		(-$7.49, -$2.41)
Large size†		-$1.61		-$0.99
		(-$6.88, $3.65)		(-$2.93, $0.93)
Sweet†		$4.20		$0.36
		(-$3.60, $11.99)		(-$2.10, $2.83)
Salty†		$2.08		-$5.89
		(-$4.28, $8.43)		(-$8.76, -$3.01)
Wild†		$3.04		$2.92
		(-$4.05, $10.14)		($0.52, $5.31)

† For these attributes only, the reported value should be interpreted as the willingness to pay a premium over and above the price of an alternative oyster having the base attribute level (i.e., medium size, mildly salty, or cultivated, respectively).

Table 12. Estimated willingness to pay a premium over and above price of generic Gulf of Mexico oyster, Generic treatment, administered to Gulf respondents only. Amounts are in dollar premium per half-dozen oysters.

	Low Information **Mean Premium (95% C.I.)**	*High Information* **Mean Premium (95% C.I.)**
Apalachicola Bay	$3.66 ($0.06, $7.26)	$5.43 ($0.30, $7.44)
Bay Saint Louis	$2.68 (-$0.96, $6.32)	$5.25 (-$0.46, $7.05)
Champagne Bay	$5.36 ($2.01, $8.72)	$4.23 (-$1.26, $8.28)
Lonesome Reef	$1.77 (-$1.98, $5.51)	$4.05 (-$1.66, $8.24)
Point aux Pins	$1.18 (-$2.95, $5.31)	$2.07 (-$4.41, $8.55)
Portersville Bay	$0.29 (-$3.80, -$4.38)	
Hood Canal	-$0.57 (-$4.52, $3.38)	-$1.38 (-$4.40, $7.16)
Cape Cod		-$0.64 (-$8.91, $7.64)
Chesapeake Bay	$3.92 (-$0.17, $8.02)	$2.41 (-$3.67, $8.48)
Small size†		-$1.97 (-$3.81, -$0.12)
Large size†		$0.23 (-$1.39, $1.85)
Sweet†		$0.0009 (-$1.62, $1.64)
Salty†		$0.61 (-$1.18, $2.40)
Wild†		$1.97 ($0.07, $3.87)

† For these attributes only, the reported value should be interpreted as the willingness to pay a premium for the specified attribute over and above the price of an alternative *branded* oyster having the base attribute level (i.e., medium size, mildly salty, or cultivated, respectively).

4301	*Price per half-dozen*	I am MOST LIKELY to buy:	I am LEAST LIKELY to buy:
A	**$14**	☐	☐
B	**$10**	☐	☐
C	**$14**	☐	☐

7303	*Price per half-dozen*	I am MOST LIKELY to buy:	I am LEAST LIKELY to buy:
Point aux Pins, Grand Bay, AL *Raised and harvested by hand from the waters of Grand Bay, Alabama.*	**$14**	☐	☐
Shigokus, Willapa Bay, WA *Raised and harvested by hand from the waters of Willapa Bay, Washington.*	**$10**	☐	☐
Island Creeks, Duxbury Bay, MA *Raised and harvested by hand from the waters of Duxbury Bay, Massachusetts.*	**$14**	☐	☐

Figure 5. Example taste panel vote cards for blind (top) labeled (bottom) rounds.

Oysters on the half-shell	Price per half - dozen	Most likely to buy	Least likely to buy
Point aux Pins, Grand Bay, Alabama Cultivated oysters, medium sized, mildly salty	$12		
Cape Cod, Massachusetts Wild oysters, small size, sweet	$18		
Gulf of Mexico Wild oysters, sizes vary, saltiness varies	$9		

[ ] I am not willing to buy any of these oysters at these prices

Oysters on the half-shell	Price per half - dozen	Most likely to buy	Least likely to buy
Apalachicola Bay, Florida	$10		
Willapa Bay, Washington	$16		
Chesapeake Bay, Virginia	$12		

[ ] I am not willing to buy any of these oysters at these prices

Figure 8. Example choice sets for online survey: high-information including generic Gulf oyster (top) and low-information not including generic Gulf oyster (bottom).