

Consumer Demand for Sustainable American Shrimp

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Abstract

Increasing competition from foreign imports and rising fuel prices have seriously threatened the Gulf of Mexico shrimp fishery. If the industry is to survive, fishermen must receive more money for their shrimp. This crisis presents an opportunity to address the environmental degradation caused by shrimp trawling, while at the same time providing economic stability for fishermen. By marketing their shrimp as both American and environmentally friendly, fishermen may be able to increase the price of their shrimp. This study investigates consumer willingness to pay for American and environmentally labeled shrimp using survey methodology., Evidence of increased willingness to pay on the part of consumers may provide the impetus necessary to convince fishermen to change their fishing strategies and earn an eco-friendly label.

Introduction

For decades the Gulf of Mexico shrimp fishery has provided both a cultural and economic foundation for much of the Southeast region. Today, facing financial crisis due to import competition and fluctuating fuel costs, the industry is near collapse. If the shrimp industry is to survive, it is likely that the ex-vessel price¹ of Gulf caught shrimp must increase. One potential solution is to market the product as American and environmentally sustainable, thereby differentiating it from foreign imports and developing a premium price. By targeting these two areas, it is possible to market shrimp to a consumer base that is increasingly interested in buying not only sustainably, but also locally produced food.² Recent literature such as Omnivore's Dilemma by Michael Pollen highlights this growing trend in consumer awareness.

¹ The price fishermen receive for for their shrimp at the dock

² Imkamp, Heiner. " The Interst of Consumers in Ecological Product Information is Growing-Evidence From Two German Srveys." Journal of Consumer Policy. Vol 23 No 2 Nov 2004

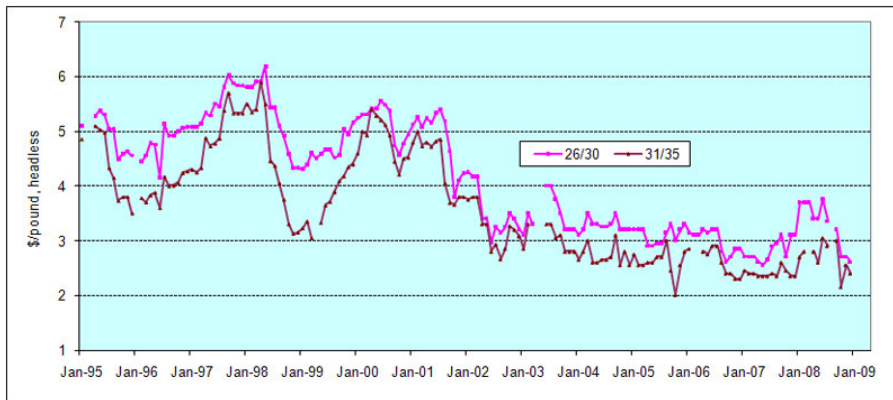
Importantly, if shrimp fishers in the Gulf of Mexico are going to market their product as environmentally sustainable, they will need to improve trawling standards within the industry. Evidence that an eco-label will increase prices will help to convince fishermen of the need for change.

This research investigates both the experience of current groups working to market American shrimp and develops a pilot study to analyze consumer willingness to pay more for American and eco-labeled shrimp. The results of the study will help to develop future marketing research that can more fully investigate consumers' willingness to pay higher prices for labeled shrimp.

Background

The Gulf of Mexico shrimp fishery is one the largest and most important fisheries in the United State's, landing around 115, 566 tones of shrimp per year. Over the past decade consumer demand for shrimp has grown such that consumption of shrimp is now higher than any other type of seafood in America with the average American consuming about 1.9 kg of shrimp a year.³ Despite this high demand, declining prices of shrimp continue to threaten the industry, as illustrated in the following graph.

³ Gillet R. "Global Study of Shrimp Fisheries" FAO Fisheries Technical Paper. 2008.



Graph 1 decline in shrimp prices from January 1995 to January 2009⁴

Issues Facing the United States Wild Caught Shrimp Industry

Environmental Impacts of Shrimp Fishing

Almost all shrimp produced within the United States is wild caught rather than farm raised. Because of high levels of pollution that results from farmed shrimp, shrimp trawling is thought to be better for the environment. However, trawling still causes significant environmental damage.

Shrimp trawling is environmentally destructive due to high levels of bycatch, total catch of non targeted animals, and habitat destruction. In the United States, despite federally required by-catch reduction devices (BRDs), trawling remains a problem. It is estimated that 5.25 pounds of bycatch is discarded for every pound of shrimp caught in the Gulf of Mexico.⁵ Shrimp trawling is responsible for an estimated 27.3% of total fishing discards.⁶ The effect of bycatch threatens multiple species and results in irreversible ecosystem changes. For example, incidental

⁴ NOAA Fisheries "Shrimp Ex-Vessel and Whole Sale Prices". Available at <http://www.msstate.edu/dept/crec/shrimp%20landing%20prices.html>

⁵ FAO, 2008

⁶ K Kelleher, K. 2005. *Discards in the world's marine fisheries – an update*. FAO Fisheries Technical Paper 470. Rome, FAO.

take of juvenile Red Snapper has placed the Red Snapper fishery in serious jeopardy.⁷ Catch of sea turtles, all seven species of which are threatened, is also a significant problem. While all boats are required to carry turtle excluder devices (TEDs), turtles continue to get stuck in nets.⁸

Habitat loss is another consequence of shrimp trawling. While less is known about habitat destruction, a study by the Natural Resources Council (NRC) reported that trawling, “degrades and reduces habitat complexity...discernibly changes benthic communities and reduces the productivity of benthic habitats.”⁹

The most common solution to reducing bycatch and habitat destruction include complete or trawling bans on sensitive areas, modification of fishing gear through improved BRDs and TRDs and bycatch quotas¹⁰. Other possible solutions include reducing trawl speed, limiting trawl time and reducing the number of fishermen in the fishery.

Current Economic Issues of American Shrimp Trawling

Accounting for “70% of total weight and 80% of the total value of the shrimp landed in the United States,” the Gulf of Mexico is by far the most important shrimp fishery in the United States. Historically an extremely profitable industry, domestic shrimp began to lose value rapidly earlier this decade. A study by the National Marine Fisheries Service (NMFS) indicated a 12.5% rate of return in the Gulf of Mexico shrimp fishery in 1995. In contrast, the average rate of return in 2004 was estimated to be -41% and forecasted to “continue [to decline] throughout the fishery on average until 2012.”¹¹ Three causes account for this value loss: increasing operational costs,

⁷ FAO, 2008

⁸ FAO, 2008

⁹ NRC. 2002. *Effects of trawling and dredging on seafloor habitat*. Washington, DC, United States, Ocean Studies Board, National Research Council, National Academy Press.

¹⁰ FAO, 2008

¹¹ Travis, Michael D. and Wade L. Griffin “Update on the Economic Status of the Gulf of Mexico Commercial Shrimp Fishery” SERO-ECON-04-01. April 5, 2004

decreasing ex vessel prices due to competition from foreign imports, and increased fishing effort.¹²

Impact of Imports on the American Shrimp Trawling Industry

In 2001, as foreign imported shrimp became ever more prevalent in the American market, shrimp prices began a precipitous downward spiral. For example, in South Carolina the average price for heads-off landed shrimp decreased from \$4.29 to \$2.71 from 1997 to 2001.¹³ While prices stabilized in 2004 and 2005, rising fuel prices, most significantly in 2007 and 2008, have rendered any price recovery insignificant. Although consumer demand for shrimp has steadily increased over the last few decades, “only an estimated 8% of the shrimp consumed in the United States is from the Gulf of Mexico.”¹⁴ If the wild caught shrimp industry is to succeed in the United States, the price of shrimp must increase.

Operational Costs of the American Shrimp Trawling Industry

Importantly, there is little flexibility to reduce costs in the shrimp industry. Maintenance, fuel and crew wages account for almost all expenses. Thus there are few costs that can be eliminated.¹⁵ The most significant variable cost to fishermen is diesel fuel, which ultimately may be the deciding factor as to whether fishermen are able to earn a living, or whether they must stop fishing. Between 2002 and 2003 fuel prices increased between 21% and 29%. These

¹² A measure of the amount of fishing, which takes into account the number of hours or days spent fishing.

¹³ Fuduric et al, “Marketing wild caught south Carolina shrimp: lessons learned from agricultural niche marketing programs”. Regional Economic Development Research Laboratory. Clemson University. http://cherokee.agecon.clemson.edu/redrl_rpt13.pdf

¹⁴ Nance et al, “Estimation of the Maximum Sustainable Yield and Maximum Economic Yield in the Shrimp Fishery, in the Gulf of Mexico. Report to the Gulf of Mexico Fishery Management Council. November 2006. http://www.gulfcouncil.org/Beta/GMFMCWeb/downloads/FINAL_AdHocEffortReport_1.pdf

¹⁵ Haby, Michael G. “A review of current conditions in the Texas shrimp industry an examination of contributing factors, and suggestions for remaining competitive in the Global Shrimp Market.” Texas Cooperative Extension, Sea Grant. TAMU-SG-03-701. January 2003.

increases “significantly increase shrimp vessel’s operating costs.”¹⁶ Other variable costs include crew shares, maintenance, groceries, dock landing fees, gear repairs and insurance. Not only are these expenses difficult to reduce, but because of the competition from low cost foreign shrimp imports, fishermen cannot make up for them on the revenue side with growth in ex-vessel prices.

Although the current crisis faced by the shrimp industry is formidable, there may be solutions through marketing innovations. Already, several organizations are working to develop a premium for gulf shrimp by marketing it as “Wild American.” Importantly, none of these organizations take into account environmental standards, relying solely on the desire of the consumer to purchase American products. However, it is possible that consumers concerned about the origin of their products also take into account environmental impact.¹⁷ As shrimp trawling is environmentally destructive, it is in the economic interests of fishermen to improve standards such that they are able to market their product as not only American, but also as eco-friendly.

Willingness to Pay for Consumer Labels

A consumers’ willingness to pay more for a product reflects the ease at which they can find information about the product.¹⁸ Labels lower a consumer’s cost of searching for information. For this reason, it is in the interest of the producer to supply information to the consumer about the product through labeling practices. For example, by labeling their product as environmentally friendly, producers are informing consumers about an attribute of the product that would otherwise be unknown to the consumer. If the consumer is interested in purchasing

¹⁶ Nance et al, 2006

¹⁷ Interview, Leigh Belanger. February 2009

¹⁸ Stigler 1961

environmentally friendly products, such labeling will help him to make better purchasing decisions.

Price Premiums for eco-labeled seafood

Several studies investigating consumer's willingness to pay more for eco-labeled seafood have been conducted. Importantly, research suggests that as consumers become increasingly informed about environmental issues, they are willing to pay more for eco-labeled seafood.¹⁹ For example, studies using stated-preference methods indicate that consumers in the United States are willing to pay more for certified cod, shrimp and salmon over a non certified product of the same freshness and quality. However, this willingness to pay decreases as the price premium for the certified product increases.²⁰ Furthermore, it is suggested that consumers are not willing to switch from their favorite type of seafood to one that is eco-certified.²¹ Thus eco-certification may affect the consumers' purchasing decision when choosing between two different types of the same species, but not when choosing between species. For example while a shopper will not make a change from tuna to shrimp, she may decide to buy eco-labeled tuna rather than a brand without and eco-label. However, to date there has been no research on market data to determine if the results from these stated-preference studies are in accord with actual market practices.

Recently, the presence of eco-labeled seafood available to the consumer has increased. This may be because suppliers are aware of the premium that can be gained by marketing their product as eco-friendly. The most prevalent label is issued by the Marine Stewardship Council

¹⁹ Roheim, Cathy A. "The economics of eco-labeling" BLBK019-Ward June 2, 2008. 20:28

²⁰ Wessels, et al "Assessing consumer preferences for eco-labeled seafood: the influence of species, certifier, and household attributes." American Journal of Agricultural Economics. 81(1084-1089). 1999.

²¹ Roheim and Johnston 2006

(MSC). The MSC provides certification to fisheries that follow strict environmental standards. Importantly, demand for eco-labeled sea food comes not just from the consumer but also from corporations supplying sea food.²²

The marketing of wild Alaskan salmon provides a good example of ways in which MSC marketing can be successful. In 2000, Alaskan Salmon was certified by the Marine Stewardship Council as a sustainable fishery. Using this MSC label, information about the improved quality and health benefits of wild salmon as compared to farmed salmon, fishermen created a successful market niche for their product.²³ A 2005 report indicated that there have been over \$70 million in retail sales of wild Alaskan salmon worldwide.²⁴

Large corporations are also increasingly interested in the MSC certification. For example, Wal-Mart aims to have all MSC certified sea food within five years²⁵. As the largest corporation in the world, Wal-Mart's interest in eco certification alone should convince shrimp fishermen of the importance of this label. If shrimp fishermen can convince Wal-Mart to purchase their product, investment by Wal-Mart in the American shrimp industry could be beneficial because of the company's influence in the American economy. Whole-Foods is another corporation that is actively working to provide consumers with sustainable seafood products. In July 2008, Whole Foods issued 'Quality Standards for Farmed Finfish and Shrimp'.²⁶ While these standards do not apply to wild caught shrimp, it is clear the company is interested in providing their costumers with environmentally friendly seafood. Thus, if fishermen

²² Roheim, Cathy 2008

²³ Welche, Lane "Hope Grows in Salmon Industry." Alaska Journal of Commerce. January 5, 2004.

²⁴ World Wildlife Fun. "Analysis of Marine Stewardship Council Certification of Alaskan Salmon. http://66.102.1.104/scholar?hl=en&lr=&q=cache:duGl7W4gUYIJ:www.worldwildlife.org/trade/pubs/salmon/SalmonReport_Ch_16.pdf+%22Wild+Alaskan+Salmon%22

²⁵ Economist article

²⁶ Whole Foods Market. Seafood Quality Standards for Finfish and Shrimp. July 1, 2008

in the Gulf of Mexico can improve their environmental standards, they may be able to work with stores like Whole Foods and Wal-Mart to market their product.

In order to convince shrimp fishermen to use more environmentally sustainable practices, further evidence needs to be provided that consumers are willing to pay higher prices for eco-friendly, American shrimp. In response to this need, this research will analyze the prospects of shrimp labeling from two perspectives. First, through informational interviews, it explores the experiences groups such as the Wild American Shrimp Alliance and Chef's Collaborative, have had with marketing American shrimp. Second, it provides a pilot study of consumer willingness to pay higher prices for American shrimp and for eco-labeled shrimp.

Methods Part A: Informational Interviews

Informational interviews were conducted over the phone with Eddie Gordon, executive director of Wild American Shrimp Inc (WASI), Leigh Belanger, a program manager at the Chef's Collaborative and with regional shrimp suppliers. The purpose of these interviews was to gather information about the present success of marketing American shrimp. Research was also done on the White Boot Brigade, a group of fishermen selling their shrimp directly to local restaurants.

WASI, a non profit organization, aims to help the struggling Gulf shrimp industry compete with cheap, farm raised imports. Marketed as high end, premium quality, WASI is attempting to identify its product as a luxury item, distinct from farm raised shrimp. The Chef's Collaborative is a group of chefs "and members of the greater culinary community committed to sourcing and cooking with local, sustainable and delicious ingredients."²⁷ Some chef's within

²⁷ <http://chefscollaborative.org/about/>

this organization have committed to serving shrimp in their restaurants that is sourced from the Gulf of Mexico.

Method Part B: Survey of Consumer Demand for Wild Caught Shrimp

An intercept survey was implemented in Durham and Chapel Hill, North Carolina in order to gain an initial understanding of consumers' demand for and knowledge of American or eco-labeled shrimp. Consumers in fast food restaurants were asked to fill out surveys asking about their preference and knowledge of American shrimp.

Further research will require a random consumer sample that is more evenly distributed across the United States and a larger sample size with more variety in price and non price attributes. Consumer perception may vary regionally; thus, to get a true understanding of demand within the United States, all regions must be taken into account. However, this research will not only provide an initial idea of current perceptions, but it will also contribute to developing a study methodology for the future.

Study Region

Durham

Durham is North Carolina's fifth largest city, with approximately 209,009 inhabitants²⁸. According the 2000 United States Consensus, the city is ethnically diverse, with groups identifying as Black (43.8%), White Non-Hispanic (42.4%), Hispanic (8.6%), Asian-Indian (1.3%), Chinese (1.1%), and American Indian (0.3%).²⁹

²⁸ http://en.wikipedia.org/wiki/Durham,_North_Carolina

²⁹ <http://www.city-data.com/city/Durham-North-Carolina.html>

75% of the population is older than 18 with a median household income of \$42,321 and a median family income of \$51,162. Eight two point six percent of the population has a high school education, 41.8% a Bachelors degree and 18.3% has earned a graduate or professional degree.³⁰ Durham is part of the Research Triangle Park, and is home to Duke University and North Carolina Central University as well as research divisions of several government agencies and high tech firms.

Consumers were surveyed in fast food restaurants along Hillsborough Road. Permission to survey was granted by managers at McDonalds, Chick Fillet, Arby's and Taco Bell.

Chapel Hill

Like Durham, Chapel Hill is part of the Research Triangle Park. The University of Chapel Hill is located in Chapel Hill, a town with a population of 49,919. In Chapel Hill 76.1% of the population identifies as white, 11.4% as Black, 3.2% as Hispanic, 3.0% as Chinese, 1.6% as Asian Indian, %1.1 as Korean and %.9 as American Indian. The median household income is \$47,424, and the median family income \$91,049. Chapel Hill is the most educated population in the area with 94.3% of the population with a high school diploma, 73.6% with a bachelors degree and 40.5% with a graduate or professional degree³¹. In Chapel Hill the restaurants surveyed were Qdoba and Chipotle on Franklin Street

Survey Type and Design

This study occurred from October 2008 through January 2009. Before the formal surveys were distributed, a focus group was held and a pre-test run. The purpose of a focus group is to

³⁰ URL: <http://www.city-data.com/city/Durham-North-Carolina.html>

³¹ Chapel Hill, North Carolina (NC) Detailed Profile. <http://www.city-data.com/city/Chapel-Hill-North-Carolina.html>. Retrieved April 17, 2008.

utilize group interaction to better understand potential respondents' knowledge and perception of a subject, "it can be used to explore not only what people think but what they think and why they think that way."³² The goal of a pre test is to "identify questions that respondents have difficulty understanding or interpret differently than the researcher intended."³³

Focus Group

The focus group was held October 18, 2008 in Durham, North Carolina. Members of the group included students, health workers and nannies. The goal of this focus group was to assess consumer knowledge of shrimp fishing and labeling, test sample questions and work to improve the overall quality of the survey. The focus group resulted in questions on the survey asking about consumer willingness to pay higher prices if their income were higher. Participation in the focus group was completely voluntary and all participants filled out consent forms at the beginning of the meeting.

Pre-test

Eighteen surveys were pretested at Chipotle on Erwin Road in Durham. The purpose of the pretest was to ensure participants understood all questions and that surveys were filled out correctly. The pretest resulted in some minor changes in lettering of the survey as well as grammatical corrections.

³² Kitzinger, Jenny "Introducing Focus Groups (Qualitative Research). British Medical Journal. July 29, 1995

³³ Krosnick, John A. "Survey Research" Annu.Rev. Psychol. 1999 50:537-67

Survey

Sixty intercept surveys were conducted from November, 2008 to December 2008.

Surveys were conducted in fast food restaurant along Hillsborough Road in Durham and Franklin Street in Chapel Hill. Only restaurants where managers gave approval were surveyed. Once permission was granted, all individuals eating at the restaurant were approached and asked to fill out a ten minute survey. Participation was completely voluntary.

The survey consisted of 14 questions, 11 close ended questions, 1 open ended questions and 2 discrete choice questions in which respondents were asked to select between two different alternatives. These two questions constitute a choice experiment allowing the data to be analyzed with discrete choice modeling

Discrete choice modeling is “based on the premise that, firstly, any good or services can be described by its characteristics (or attributes) and, secondly, the extent to which an individual values a good or service depends upon the nature and levels of these characteristics”³⁴. The purpose of the model is to reveal a respondent’s “willingness to trade off one attribute against another.”³⁵ Thus it should provide insight as to what attributes, such as price or point of origin, consumers find most important. In this survey consumers were asked whether they would prefer to purchase shrimp A or shrimp B depending on price, whether it was American or imported and whether it had an environmental label. A total of six different choice modeling questions were used, two each on the different survey forms. The questions from survey A are depicted below. In survey A, the price attribute was held constant. In survey B and C price was varied and other attributes held constant.

³⁴Ryan et al “ Use of discrete choice experiments to elicit preferences” British Medical Journal. Vol3, 5731, Jan 2001.

³⁵Bennett, Jeff. “Choice Modelling a Step by Step guide by Jeff Bennett” Queensland Government. Available a at https://www.epa.qld.gov.au/publications/p01585aa.pdf/Choice_modelling_A_stepbystep_guide_by_Jeff_Bennett.pdf

	Shrimp A	Shrimp B
Price	\$7 per pound	\$7 per pound
Where it is From	Abroad	America
Label?	No	No

6.) Which would you rather purchase?

- A
- B

	Shrimp A	Shrimp B
Price	\$7 per pound	\$7 per pound
Where it is From	Abroad	Abroad
Label?	No	Yes

7.) Which would you rather purchase?

- A
- B

Survey A Choice Model Questions

Besides a final question asking respondent's for their zip code, all other questions were close ended. In surveying, close ended questions are preferable to open ended question because response variability is minimized as respondents must select between a set of given answers.³⁶ The first questions ask respondents about the number of times they eat shrimp, the factors they take into account when purchasing shrimp and their knowledge of the environmental impacts of shrimp farming. The final questions gather respondent's demographic information, such as age, schooling and income.

³⁶ Krosnick, John A, 1999

Analysis

Data analysis was broken into two parts. First, the results of each question were independently analyzed. Second, an alternative specific conditional logit model was run.

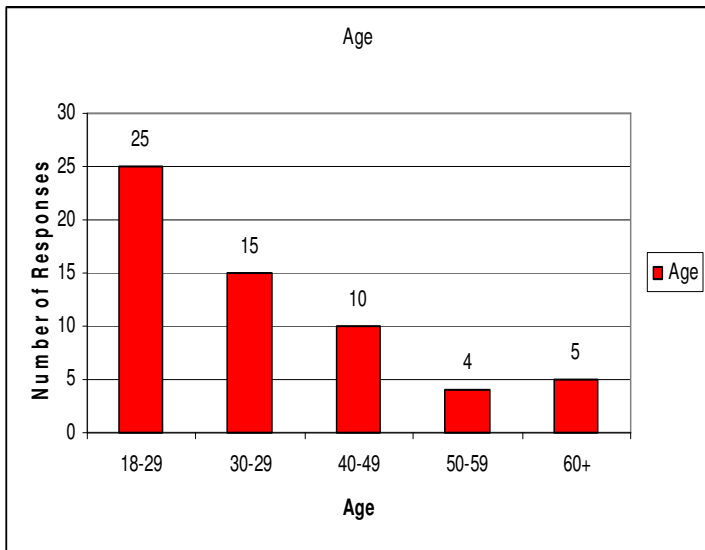
To run the model, 6 categories were developed, case, choice, dummy location, dummy label and adjusted income. The case variable refers to the individual respondent. As there were 60 respondents, each answering two discrete choice questions, each respondent was coded with two separate numbers, one for each response. For example respondent one was coded as both one and sixty one. The case refers to the decision the respondent made. In this survey there were four separate cases, or decisions; whether the respondent wanted American labeled shrimp, American unlabeled shrimp, foreign labeled shrimp or foreign unlabeled shrimp. Each alternative case was assigned a number one through four depending on the question. The choice variable refers to the decision made by the respondent. If the alternative was selected by the respondent, a value of one was listed, if the alternative was not selected by the respondent, a value of 0 was listed. The dummy variables corresponded with the respondent's choice of either American or labeled shrimp. A choice of American shrimp was coded as one, foreign as zero. Similarly a choice of labeled shrimp was coded as one and unlabeled shrimp was coded as zero. Finally the adjusted income corresponds to the respondent's indication of income. This value was calculated by subtracting the price of the shrimp, seven or nine dollars, from the mean of the respondent's income category (for example if the indicated an income between \$20,000 and \$29,999, income was recorded as \$25,000). This number was then divided by number of dinners and lunches eaten a year, or two times three hundred and sixty five. An example of the matrix used can be seen below

Person (Case)	Alternative	Choice	Dummy_Domestic	Dummy_Label	Adjusted Income
1	2	0	0	0	78.0726
1	4	1	1	0	78.0726
61	1	0	0	0	78.0726
61	2	1	0	1	78.0726
2	2	0	0	0	61.63425
2	4	1	1	0	61.63425
62	1	0	0	0	61.63425
62	2	1	0	1	61.63425
3	2	0	0	0	102.7301
3	4	1	1	0	102.7301

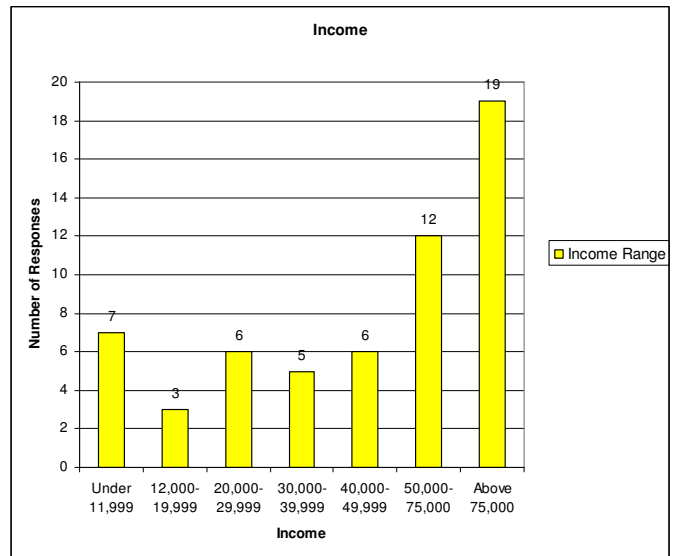
Table One: Matrix used for analysis

Results

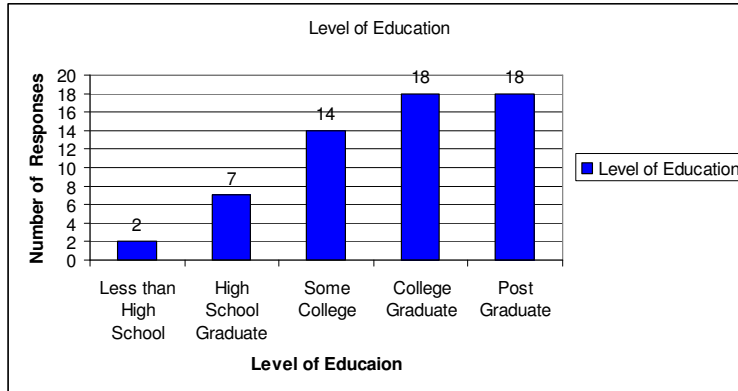
Demographics



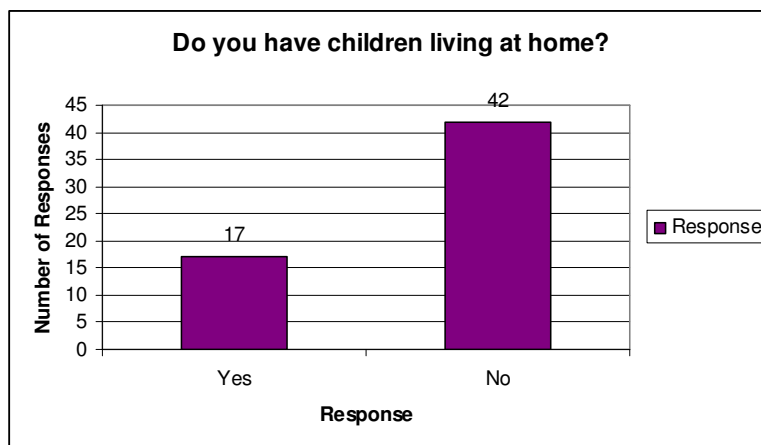
Graph1: Age



Graph2: Income



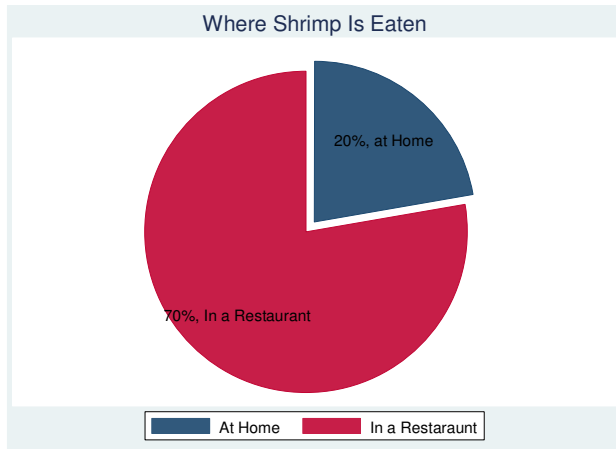
Graph 3: Level of Education



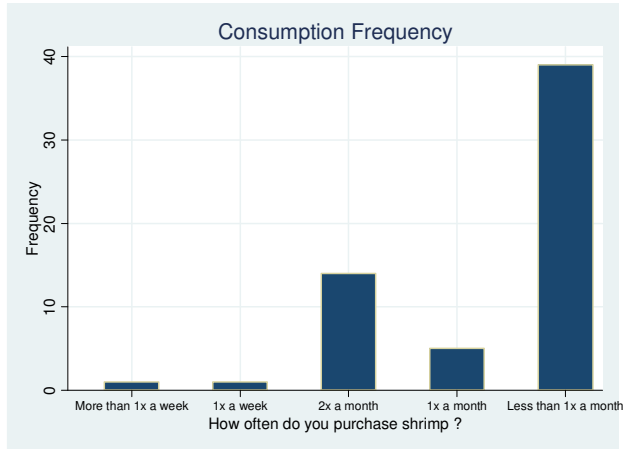
Graph 4: Do you have children living at home?

Over half the respondents are under the age of forty. The majority of respondents report a household income of \$50,000 with 31% claiming a household income over \$75,000. Sixty percent of the respondents are college graduates or more. 42 of the sixty do not have children living at home.

Purchasing Considerations and Behaviors.



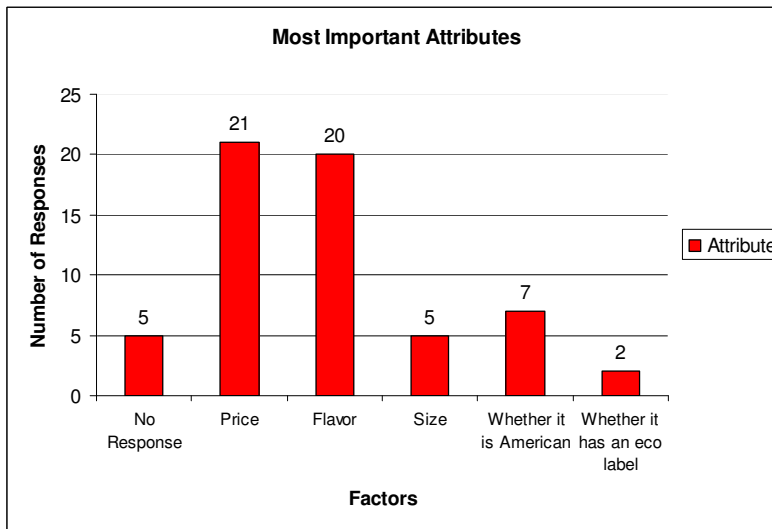
Graph 5: *Where do you usually Eat shrimp*



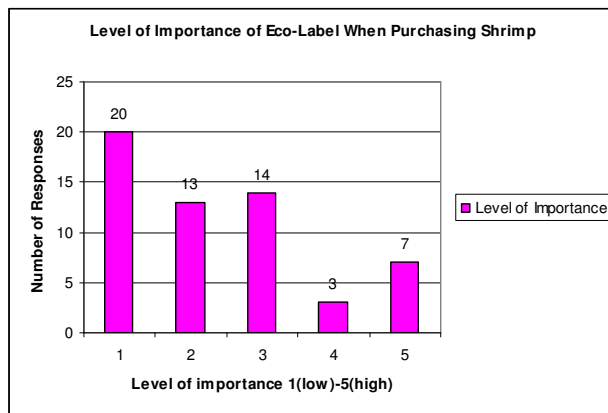
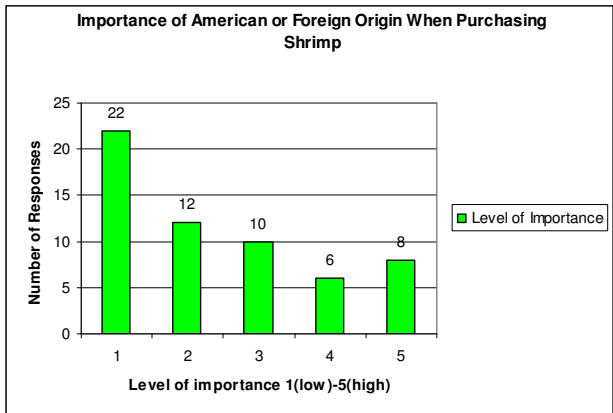
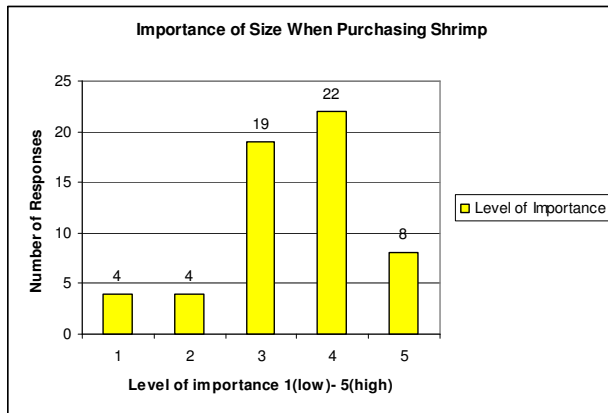
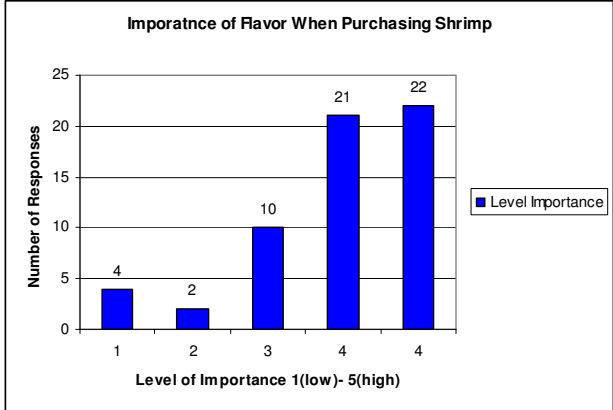
Graph 6: *How Often do you purchase shrimp?*

70% of consumers most often eat shrimp in a restaurant, and 65% purchase shrimp less than once a month.

Level of Importance of Independent Factors when Purchasing Shrimp



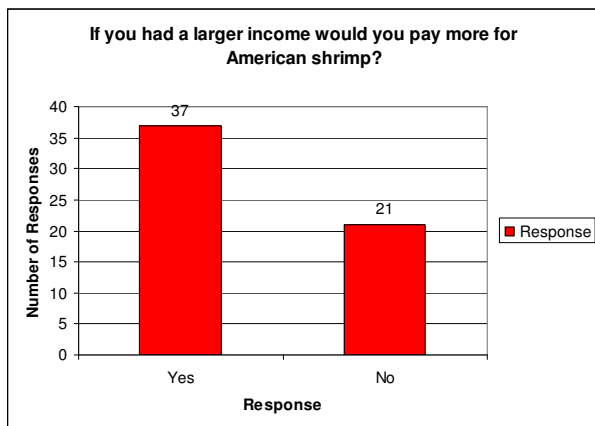
Graph 7: *What respondents consider to be the most important attribute about shrimp when making a purchasing decision*



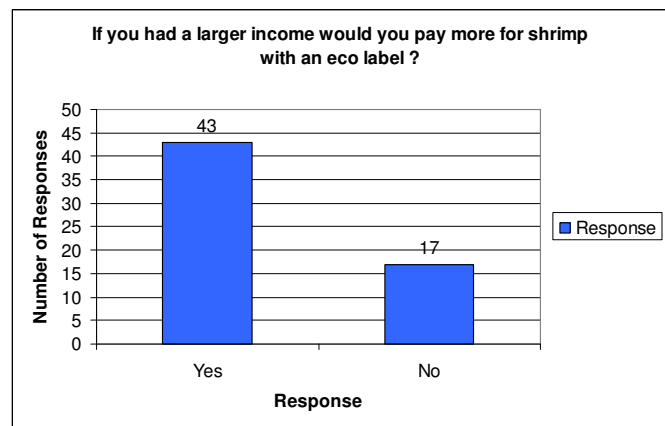
Graph 8: Responses to the question Please circle from one to five, one being the least important, five being the most important, the following factors you consider when purchasing shrimp. You can circle the same number more than once

When purchasing shrimp, the majority of respondents indicated that price or flavor was the most important consideration. 21 of 60 respondents marked price and 20 of 60 marked flavor as the

most important factor. Only 2 indicated an eco label as being an important factor where as 7 indicated that whether the shrimp was American or not was important. When the factors were looked at independently, most respondents considered price and flavor to rank high (a level of four or five) when making purchasing decisions. However, the majority of respondents did not rank American or eco-labeling as very important (a level of one or two).



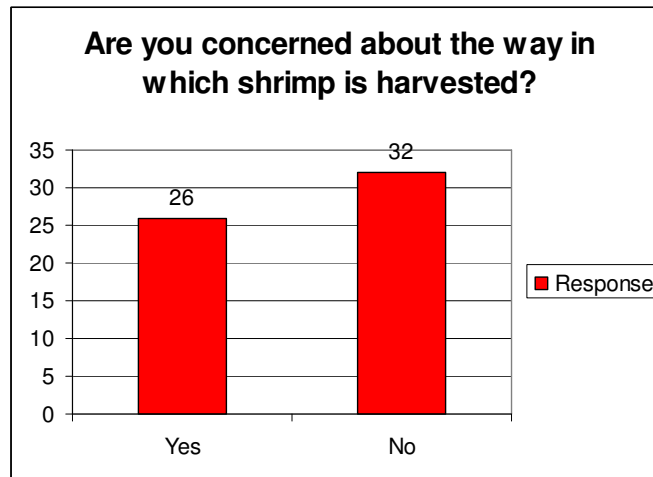
Graph 9: *If you had a larger Income would you pay more for American shrimp?*



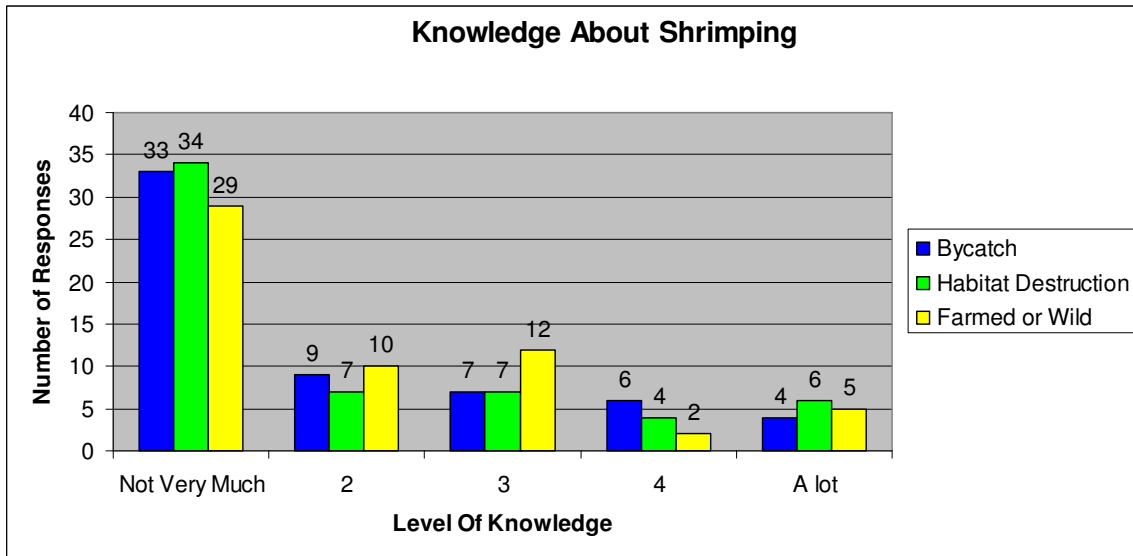
Graph 10: *If you had a larger income would you pay more for shrimp with and eco-label*

When consumers were asked if they would pay more for either American shrimp or eco-labeled shrimp if they had a larger income, most respondents responded yes: 61% of respondents would pay more for American shrimp if they had a larger income and 70% of respondents would pay more eco-labeled shrimp.

Knowledge and concern about shrimp fishing



Graph 11: *Are you concerned about the way in which shrimp is harvested*

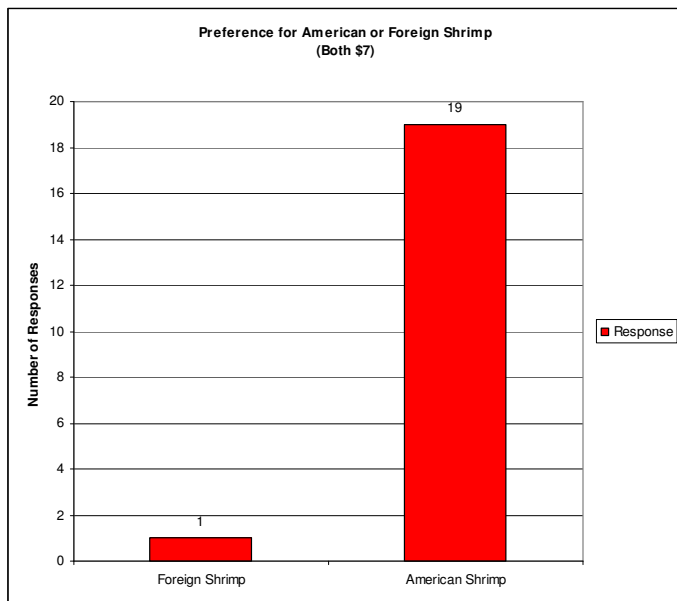


Graph 12: *How much respondents know about different aspects of shrimp fishing*

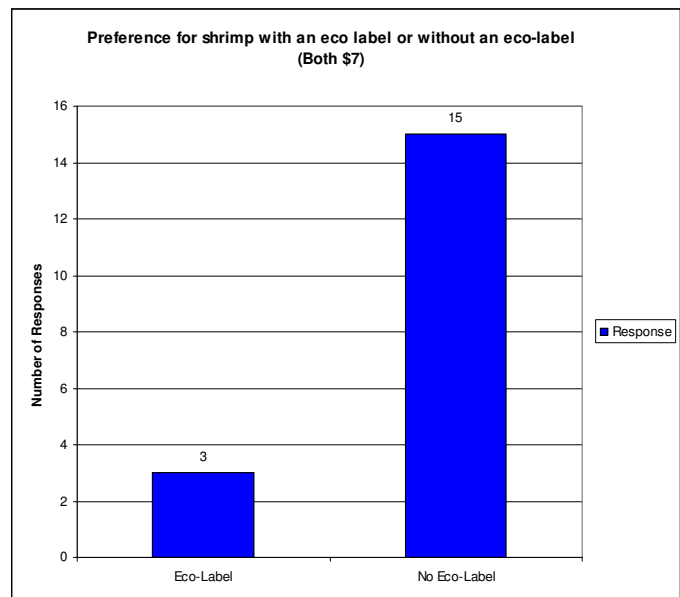
53.3% of respondents are not concerned about the way in which shrimp is harvested. When respondents were asked how much they knew about the amount of fish caught when fishing for shrimp (bycatch), the effect of shrimp nets on the ocean floor (habitat destruction) and the difference between wild caught and farm raised shrimp (farmed or wild) few consumers indicated very much knowledge. A majority of respondents indicated a knowledge level of one, the lowest level.

Looking at the results above, it is clear, that compared to the Durham and Chapel Hill populations, survey respondents were quite well educated, young and financially well off. While most respondents indicated little knowledge of habitat destruction, by catch and the way in which the shrimp was farmed just under half indicated a concern about the way in which shrimp is harvested. Clearly, price is the most important factor considered when respondents make purchasing decisions, however flavor and size were also important considerations. Finally, the majority of respondents would pay more for eco-labeled and American shrimp if they had a larger income.

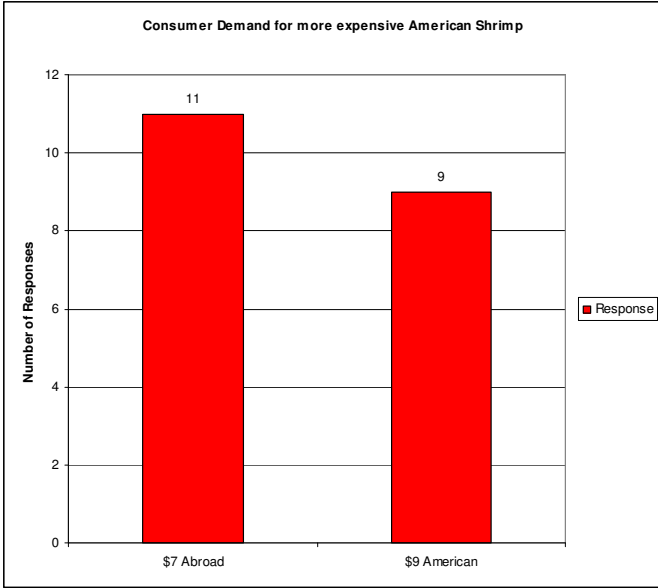
Discrete Choice Models



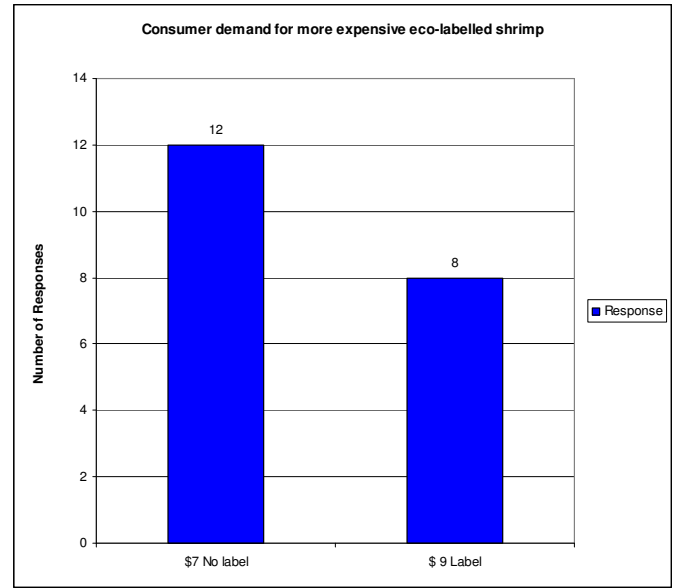
Graph 13: Consumer preference for American Or imported shrimp if both varieties cost \$7



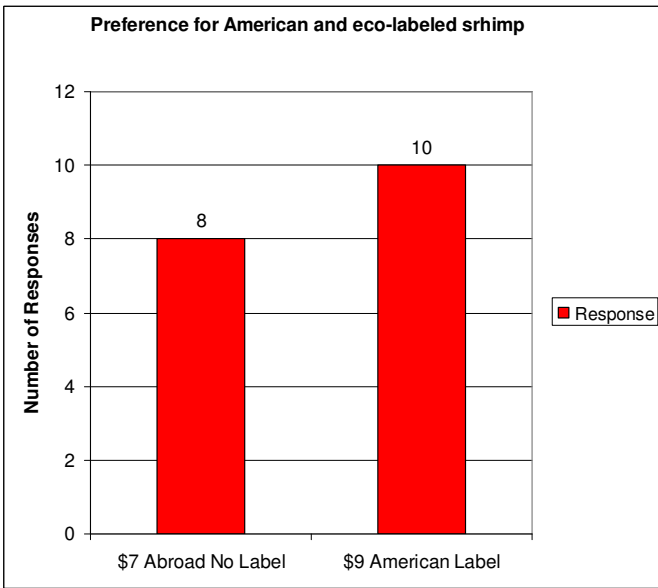
Graph 14: Consumer preference for eco-labeled or non eco labeled shrimp if both Varieties cost \$7



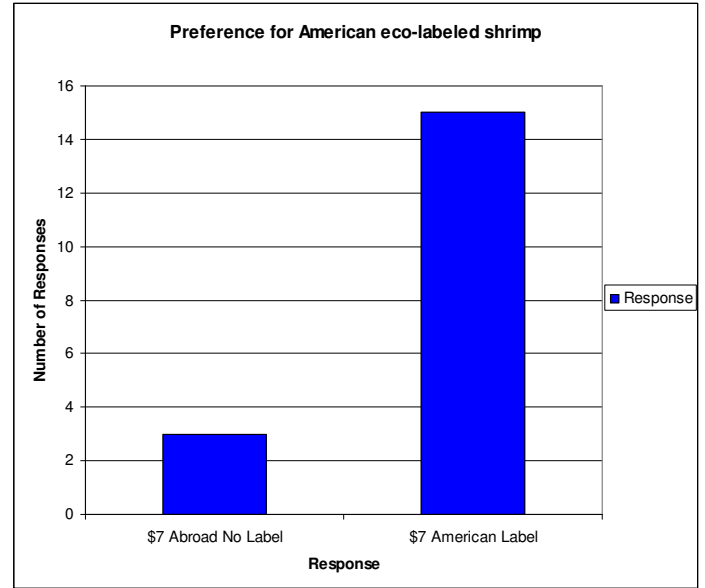
Graph 15: Consumer preference for \$9 American Shrimp as compared to \$7 imported shrimp



Graph 16: Consumer preference for \$7 non-eco labeled shrimp as compared to \$9 eco-labeled Shrimp both foreign



Graph 17: Consumer preference for \$9 American Shrimp with an eco label as compared to \$7 imported shrimp without a label



Graph 18: Consumer preference for \$7 American shrimp with a label as compared to \$7 imported shrimp without a label

95% percent of consumers would to buy American shrimp if it cost the same as foreign shrimp. This percentage drops to 45 percent if the price is increased by \$2. 83.3 percent of consumers would buy eco-labeled shrimp foreign shrimp if it was equivalent in price to non labeled shrimp. This percentage decreases to 40 percent if the price rises by \$2. The discrepancy between respondents who would buy American or eco-labeled shrimp and those who would buy foreign and non labeled shrimp is not as high when the prices are different as when the prices are the same. Thus, not all consumers change their minds as to what type of shrimp they would prefer to buy when the prices vary.

Finally, 83.3% of respondents would purchase American, eco-labeled shrimp if both were priced at seven dollars. This outcome is not surprising. However, 55 % of respondents would pay more for shrimp that is labeled as both environmentally friendly and American. Thus when shrimp has both labels, American and eco-friendly, as compared to just one, more respondents will pay \$9 dollars for the labeled shrimp as compared to the \$7 unlabeled shrimp. This result emphasizes the fact that consumers who are concerned about the point of origin of their food are also concerned about the environmental impacts of their food.

Alternative Specific conditional logit.model

To analyze the discrete choice models, an alternative specific conditional logit model was used. This method was first seen in Daniel McFadden's study of "the decision making of the California Highway Commission."³⁷ The concept behind the model is that individual's face a finite number of choices and selects the choice that maximizes utility. Thus by analyzing the

³⁷ Manski, Charles F. "Daniel McFadden and the Econometric Analysis of Discrete Choice." *Scandinavian Journal of Economics*. 103(2). 2001

choices made by respondents, one can attempt to get an idea of the utility gained by making that choice as compared to a different choice.³⁸

From this model, willingness to pay more for labeled shrimp should be able to be analyzed. However, because the variation between the two prices was so small (\$2), it was impossible to use the model outputs to determine Willingness to Pay. The empirical estimates were too large to be exponentiated. However, it is still possible to use the model to compare the difference in utility respondents received from the choices.

The outcome of model gives an idea of the utility gained by respondents from choosing a specific alternative. The model was run three different times first just against the adjusted income, then with the domestic dummy variable, and finally with the dummy label variable. The results can be seen in the table below

```

Alternative-specific conditional logit      Number of obs      =      224
Case variable: personcase                Number of cases    =      112

Alternative variable: alternative         Alts per case: min =      2
avg =          2.0
max =          2

Wald chi2(1)      =          0.02
Log likelihood = -74.28242                Prob > chi2       =      0.8755

```

choice	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
alternative						
adjincome	.3414382	2.178486	0.16	0.875	-3.928315	4.611192
alternative1						
_cons	-.452053	.2983363	-1.52	0.130	-1.036781	.1326755
alternative2						
_cons	-.4270641	.2871341	-1.49	0.137	-.9898365	.1357083
alternative3						
_cons	-.6181028	.4688453	-1.32	0.187	-1.537023	.3008171

³⁸ Manskir, Charles, 2001

alternative4 | (base alternative)

Alternative-specific conditional logit Number of obs = 224
Case variable: personcase Number of cases = 112

Alternative variable: alternative Alts per case: min = 2
avg = 2.0
max = 2

Wald chi2(2) = 10.75
Log likelihood = -61.338639 Prob > chi2 = 0.0046

choice	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
alternative						
adjincome	391.6294	233.1586	1.68	0.093	-65.35309	848.6118
dummy_dome~c	2.572892	.8044967	3.20	0.001	.9961072	4.149676
alternative1						
_cons	-2.076774	.8149523	-2.55	0.011	-3.674052	-.4794973
alternative2						
_cons	-1.190323	.8210266	-1.45	0.147	-2.799506	.4188595
alternative3						
_cons	.3342274	.7965369	0.42	0.675	-1.226956	1.895411
alternative4	(base alternative)					

max = 2

Wald chi2(3) = 14.81
Log likelihood = -57.984836 Prob > chi2 = 0.0020

choice	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
alternative						
adjincome	152.3319	248.8822	0.61	0.540	-335.4682	640.1321
dummy_label	1.191356	.4967447	2.40	0.016	.2177543	2.164958
dummy_dome~c	2.000061	.8512801	2.35	0.019	.3315822	3.668539
alternative1						
_cons	-2.685865	.8981709	-2.99	0.003	-4.446248	-.9254826
alternative2						
_cons	-1.862318	.8879035	-2.10	0.036	-3.602577	-.1220596
alternative3						
_cons	-1.494253	1.065656	-1.40	0.161	-3.5829	.5943931
alternative4	(base alternative)					

The utility generated due to adjusted income was not significant at the five percent level in any of the iterations. It is significant at the 10% level when run with just the domestic variable ($p=.093$). However, the marginal utility of income is significantly smaller, and thus more reasonable when both dummy variables are excluded. Because of the lack of significance in the model, not much information can be garnered. However, it is still interesting to look at the outcomes. Because the model is most significant for the four alternatives when all three variables are used, adjusted income, dummy domestic and dummy label, this is the model that will be analyzed.

Discussion A: Interviews

Discussion with Eddie Gordon from Wild American Shrimp, Leigh Belanger from the Chef's Collaborative, research on the White Boot Brigade and conversations with shrimp processors and distributors in the South East region provides invaluable information about current attempts to increase the ex vessel price of American shrimp. This information combined with a better understanding of consumers' knowledge and willingness to pay more for an American eco-certified product will help to inform the industry about ways in which they can try to increase the price of shrimp. If the price of shrimp within the United States fails to rise, the industry will continue to struggle to compete with cheap, farm raised imports.

Wild American Shrimp Inc

Using quality and American origin as its primary marketing tools, WASI has had some success in gaining market share. It is currently thought to have about 5% of the U.S. market, with

imported shrimp making up 87% of the market.³⁹ However, transparent standards that define the WASI program are lacking in respect to both quality and environmental considerations.

Certification is open to harvesters, processors, distributors, retailers, grocers and restaurateurs. Certification is said to “ensure that warm water wild caught shrimp from US coastal waters meet a high standard of quality and consistency.”⁴⁰ While Eddie Gordon, executive director of WASI, has indicated a push towards reducing the number of shrimp that can be considered WASI certified, there is no clear evidence as to how shrimp meet or do not meet these standards. Indeed, it is unclear that anything beyond simply joining the WASI organization is required to become certified.⁴¹

Currently WASI shrimp is sold mostly in restaurants and grocery stores in the southeast U.S. Several brand names also sell frozen WASI brand shrimp.⁴² However, certified processors and distributors do not focus on selling WASI shrimp exclusively. As stated by Nancy Mathews of Cox’s Wholesale Seafood in Tampa, “our core retail customers have always carried Florida pink shrimp as well as white shrimp from another country and perhaps black tigers. The majority [of supermarkets] need that variety. Consumers have so many different wants that having one type of shrimp is not going to capture all of that.”

Finally, there is no clear evidence as to whether WASI certification helps Gulf shrimpers. While shrimpers get 30 cents more per pound for *Emeril Lagasse’s* WASI certified frozen shrimp, there are no other indicators that the label increases prices. In fact, the WASI label on Bumble Bee canned shrimp has done nothing to increase the market price of the product.⁴³

³⁹ Interview with Casson Trenor . [FishWise](#).6/26/2008

⁴⁰ Ramsayer, Rick “Gulf shrimp: Marketing Initiatives Strive to Boost Demand and Price for Domestic Catch.” [Seafood Business](#). 0889-3217. 2007

⁴¹ Interview with Casson Trenor. [FishWise](#) 6/26/2008

⁴² <http://www.wildamericanshrimp.com/main.html>

⁴³ Ramsayer, Rick. June 15, 2007

While it does not increase the price, the label may make consumers choose one brand over another.

Chefs Collaborative

The chef's collaborative has done some work to popularize Gulf caught shrimp within the restaurant community. While, they have found some success, as shrimp is seasonal, many restaurants will supplement American shrimp with farm raised imports. Furthermore, according to Leigh Belenger, costumers concerned about the point of origin of their food tend to be concerned about its environmental impacts. As shrimp can not currently be sold as environmentally friendly, it is harder to market to this niche of consumers.⁴⁴

One success described resulted from the partnership of a Louisiana shrimper and a Boston based chef. Rather than selling to wholesalers, the shrimper sells his shrimp directly to the chef, who markets the shrimp to his costumers as "Bob's Louisiana shrimp," The chef pays about \$9 a pound for size 25 shrimp and sells a plate of shrimp and grits (five shrimp per plate) for \$22. With no middle man costs, both the fisherman and chef benefit from this relationship.

White Boot Brigade

Traveling around the United States to create awareness about American shrimp, the White Boot Brigade has successfully developed relationships with organizations both within and outside of the industry. For example, they work with regional restaurants and Fed Ex to provide fresh, White Boot Brigade shrimp.

The White Boot Brigade outlines several environmental criteria that its fishermen must follow. For examples, fishermen must look into the possibilities of using biodiesel, "harvest and

⁴⁴ Interview, Leigh Belenger Feb 2009.

sell chemically free wild caught shrimp”, excluding minimum amounts of bi-sodium sulfate, increase shrimp size below 70-90 per pound, and limit trawls to less than two hours “as much as possible.” However, these “sustainability criteria” may be more for image than they are for environmental protection. For example their sustainability definition focuses only on the abundance of the shrimp population, failing to acknowledge problems with habitat impacts or by catch. Finally clauses such as “as much as possible” provide little in the way of verifiable performance targets for shrimpers. However, this is the only group currently attempting to develop environmental standards. It sets a good example of the type of criteria that can be implemented to make the industry more sustainable.

Success

There is some indication that consumer demand for wild American shrimp is growing. Between 2002 and 2003, 220,000 pounds of wild caught shrimp were sold, between 2004 and 2005 this increase to 1.4 million pounds⁴⁵. Part of this demand is a result of a large scale marketing campaign from groups such as WASI and the White Boot Brigade, as well as within individual states. In 2005 the industry received \$ 35 million in federal aid, part of which is targeted for these advertising campaigns.⁴⁶ However, the marketing campaign is not the only explanatory factor in increased demand. These factors include import tariffs and a recent food scare due to contaminated imported Chinese shrimp.⁴⁷ In order to compete with cheap foreign imports, it is clear that American fishermen will have to market their product as separate and superior to foreign imports. While both WASI and the White Boot Brigade have made some attempt to differentiate their product, notable problems exist with their campaigns. First, and

⁴⁵ These numbers reference sales of Wild shrimp, not necessarily WASI brand.

⁴⁶ Ramsayer, Rick 2007

⁴⁷ “China Scare a boost for WASI”. Seafood Business. August 14, 2007.

most importantly, they are certifying themselves. With no third party validation, self certification is meaningless. Also, their standards and criteria are either not publically available, non existent, too general, or too lax. As a result, there is no guarantee that the quality of the product will improve, and further, no way to market the product as a better environmental choice for consumers. Thus, if there is to be a successful marketing campaign, third party verification is key. With changing consumer trends and a larger focus on environmental attributes, part of the success of this campaign will need to be not simply be a focus on “buy American” and improved quality, but one of environmental responsibility. The marketing of wild Alaskan salmon provides a good examples of ways in which this marketing can be successful. In 2000 Alaskan Salmon was certified by the Marine Stewardship Council as a sustainable fishery. Using this MSC label, information about the improved quality and health benefits of wild salmon as compared to farmed salmon, fishermen created a successful market niche for their product.⁴⁸ A 2005 report indicated that there have been over \$70 million in retail sales of wild Alaskan salmon worldwide.⁴⁹

With respect to the shrimp fishery, combining some level of third party certification with a well organized marketing plan that emphasizes shrimp as American as well as environmentally friendly could help raise domestic shrimp prices.

Discussion B: Survey Results

Overall the surveyed population was quite young and well educated, with 30% having earned a graduate degree and with an average household income of \$75,000 or higher.

⁴⁸ Welche, Lane “Hope Grows in Salmon Industry.” Alaska Journal of Commerce. January 5, 2004.

⁴⁹ World Wildlife Fund. “Analysis of Marine Stewardship Council Certification of Alaskan Salmon.”

http://66.102.1.104/scholar?hl=en&lr=&q=cache:duGl7W4gUYIJ:www.worldwildlife.org/trade/pubs/salmon/SalmonReport_Ch_16.pdf+%22Wild+Alaskan+Salmon%22

35% of the respondents answered that of five attributes considered when purchasing shrimp, price is most important. This result is expected, as price likely plays a large role in almost all purchasing decisions. Interestingly, seven respondents or 11% of the survey population indicated that purchasing American shrimp was the most important consideration. Furthermore, 13% indicated a five when asked how important American origin was while deciding to buy shrimp (one being the lowest, five the highest). While survey respondents are not representative of the American population, there clearly is awareness about purchasing American shrimp as compared to foreign imports. In contrast, only two respondents answered that eco-labeling was the most important consideration. Thus, it appears as though eco certification is not as large a concern as whether shrimp is from America or abroad. Concern about purchasing American shrimp may have developed after Hurricane Katrina when the plight of Gulf shrimp fishermen was largely publicized.

Interestingly despite respondent's indication of price as an important factor, according to the discrete choice analysis 45% of would pay two dollars more to purchase American instead of imported shrimp and 20% would pay two dollars more for eco-labeled shrimp. If there is no price variation, almost all consumers would buy American eco-labeled shrimp. Finally and most importantly, the majority of respondents (55%) would pay more for shrimp that is *both* from American and eco-labeled. Thus, while price does play a role in decision making, consumers will take into account other factors. This result suggests there is a role for premium labeled shrimp in the market. This is supported by the fact that almost all consumers indicated that they would be willing to pay more for American shrimp, or eco-labeled shrimp if they had a larger income.

It is important to note that the survey has been implemented in a time of economic hardship for the United States. Thus many of the respondents may be far more price conscience

than had the survey been implemented a year ago. As the economy becomes worse, consumers will increasingly take into account price and less so other factors. However this does not mean labeling cannot be successful. Cheap prices will continue to threaten American shrimp, and unless fishermen can sell their product at a higher rate, the industry will suffer. Furthermore, there will still be consumers willing to pay premium prices for quality products.

Looking at the results of the alternative specific logit model, it appears as though respondents gained the largest amount of utility from selecting American eco labeled shrimp. While it is impossible to determine the exact willingness to pay for American eco-labeled shrimp, respondents did value this choice over the others. This result corresponds with the results indicating that a larger number of respondents would be willing to pay more for eco-labeled American shrimp than for shrimp with just an eco label, or shrimp that is not eco-labeled but was caught in American. The large variability among models suggests that the model is unstable due to a small sample size and the small difference in prices between options. If willingness to pay is to be calculated there must be a larger sample size and the difference in price between different types of shrimp must be larger. However, interesting information can still be gained by looking at the model.

Looking at results from the third model, the utility that results from alternative one, or American eco-labeled shrimp is higher than any of the other alternatives, suggesting respondent's gained most utility from this alternative. This utility can be measured by adding the coefficient of the dummy variables to the coefficient of alternative one, or $2 + 1.19 - 2.69$ which results in .5. The utility for each alternative is calculated and listed in the table below.

Alternative One: American, eco-labeled shrimp	$2 + 1.19 - 2.69 = .5$
Alternative Two: Domestic, non eco-labeled shrimp	$2 - 1.96 = .14$
Alternative Three: Foreign, eco-labeled shrimp	$1.19 - 1.49 = -.3$
Alternative Four: Foreign, non labeled shrimp	0

Table 2: *Utility Outcomes for alternatives one through four*

Error Structure

It is important to note that this survey does not represent a random sample of the consumer population. This is a pilot study designed to gather initial consumer information as well as to develop survey methodology for future use. In the future, several steps need to be taken to both improve the randomness and quality of the survey.

First, if it is to be truly representative, the survey should be a mail based survey sent to respondents across the United States. If the respondent base is not more varied, regional differences in awareness about American shrimp and concern for the environment will bias the results. A larger sample size will also improve the quality of the results, reducing the error and increasing the significance of the outcomes. To implement this type of research, a mail survey would need to be used. Importantly, a mail based survey will require far more resources to successfully implement. This must be taken into account before moving forward.

Furthermore, the price differential between American, labeled and foreign unlabeled shrimp is not that large. To get a true idea of consumer willingness to pay more a variety of price differentials need to be tested. For example, a difference between shrimp that is \$7, \$9, \$10 and \$12 could be tested. Finally, more in depth demographic data would be helpful, with questions about household size and more detailed household income level included.

Conclusion

The results from this pilot study indicate that there is some willingness to pay more for American, eco-labeled shrimp. While this is an important conclusion, more thorough tests must be run before concluding that the American consumer will pay more for these labels. However, these results are an important start. If fishermen are convinced that they will receive higher ex-vessel prices for shrimp that is caught in a sustainable way, there will be incentive within the industry to decrease the impacts of trawling.

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Appendix A: Survey A

Consumer Demand for Wild Caught Sustainable Shrimp

This study is being conducted by a Duke University graduate student to get a better understanding of demand for sustainably harvested American shrimp. The information in the survey will be used to inform non profit groups developing methods to sustainably harvest shrimp. The information is also to be used for a basis for a graduate thesis. There are questions about shrimp consumption. There are also some questions that ask for relevant information about you, such as your income range and family size. You will not be ask to give your name. Your responses to the questions cannot be connected to your name. This survey should take about 15 minutes to complete. Participation in the survey is voluntary and all information will be kept confidential. You may stop taking the survey at any time and you may skip any questions you do not feel comfortable answering. Participants must be 18 or older. Thank you for your help.

1.) How often do you purchase shrimp?

- More than once a week
- Once a week
- Two times a month
- Once a month
- Less than once a month

2.) Where do you usually eat shrimp?

- At home
- In a restaurant

3.) Please circle from one to five, one being the least important, five being the most important, the following factors you consider when purchasing shrimp. You can circle the same number more than once

a. price	1	2	3	4	5
b. flavor	1	2	3	4	5
c. size	1	2	3	4	5
d. whether it is American or imported	1	2	3	4	5
e. whether it is wild caught or farmed	1	2	3	4	5

Of the factors listed above, which is the most important, **please fill in the letter** _____

4.) How much do you know about the following? Please rank from 1 to 5, 1 being the lowest, 5 being the highest. You can circle the same number more than once

- a. The amount of other fish caught when fishing for shrimp

1	2	3	4	5
---	---	---	---	---
- b. The effect of shrimp nets on the ocean floor

1	2	3	4	5
---	---	---	---	---
- c. The difference between farm raised and wild caught shrimp

1	2	3	4	5
---	---	---	---	---

5.) Are you concerned about the way in which shrimp is harvested?

- yes
- no

	Shrimp A	Shrimp B
Price	\$7 per pound	\$7 per pound
Where it is From	Abroad	America
Eco-Label?	No	No

6.) Which would you rather purchase?

- A
- B

	Shrimp A	Shrimp B
Price	\$7 per pound	\$7 per pound
Where it is From	Abroad	Abroad
Eco- Label?	No	Yes

7.) Which would you rather purchase?

- A
- B

8.) If you had a larger income, would you pay more for American shrimp than for shrimp caught abroad?

- Yes

No

9.) Would you spend more on shrimp that has an “environmentally friendly label?”

Yes

No

Background Information

10.) What is your age?

18-29

40-49

60+

30-39

50-59

11.) What was the last level of schooling you completed?

Less than high school graduate

High school graduate

Some college

College graduate

Post graduate

12.) In which of the following ranges does your total household income fall?

\$11,999 and below

\$12,000 - \$19,999

\$20,000 - \$29,999

\$30,000 - \$39,999

\$40,000 - \$49,999

\$50,000 - \$75,000

Above \$75,000

13.) Do you have children living at home?

Yes

No

14.) What is your zip code? _____

Appendix B: Survey B

Consumer Demand for Wild Caught Sustainable Shrimp

This study is being conducted by a Duke University graduate student to get a better understanding of demand for sustainably harvested American shrimp. The information in the survey will be used to inform non profit groups developing methods to sustainably harvest shrimp. The information is also to be used for a basis for a graduate thesis. There are questions about shrimp consumption. There are also some questions that ask for relevant information about you, such as your income range and family size. You will not be ask to give your name. Your responses to the questions cannot be connected to your name. This survey should take about 15 minutes to complete. Participation in the survey is voluntary and all information will be kept confidential. You may stop taking the survey at any time and you may skip any questions you do not feel comfortable answering. Participants must be 18 or older. Thank you for your help.

1.) How often do you purchase shrimp?

- More than once a week
- Once a week
- Two times a month
- Once a month
- Less than once a month

2.) Where do you usually eat shrimp?

- At home
- In a restaurant

3.) Please circle from one to five, one being the least important, five being the most important, the following factors you consider when purchasing shrimp. You can circle the same number more than once

a. price	1	2	3	4	5
b. flavor	1	2	3	4	5

- c. size 1 2 3 4 5
 d. whether it is American or imported 1 2 3 4 5
 e. whether it is wild caught or farmed 1 2 3 4 5

Of the factors listed above, which is the most important, **please fill in the letter** _____

4.) How much do you know about the following? Please rank from 1 to 5, 1 being the lowest, 5 being the highest. You can circle the same number more than once

- d. The amount of other fish caught when fishing for shrimp 1 2 3 4 5
 e. The effect of shrimp nets on the ocean floor 1 2 3 4 5
 f. The difference between farm raised and wild caught shrimp 1 2 3 4 5

5.) Are you concerned about the way in which shrimp is harvested?

- Yes
 No

	Shrimp A	Shrimp B
Price	\$7 per pound	\$9 per pound
Where it is From	Abroad	America
Environmental Label?	No	No

6.) Which would you rather purchase?

- A
 B

	Shrimp A	Shrimp B
Price	\$7 per pound	\$9 per pound
Where it is From	Abroad	Abroad
Environmental Label?	No	Yes

7.) Which would you rather purchase?

- A
 B

8.) If you had a larger income, would you pay more for American shrimp than for shrimp caught abroad?

- Yes
- No

9.) Would you spend more on shrimp that has an “environmentally friendly label?”

- Yes
- No

Background Information

10.) What is your age?

- 18-29
- 30-39
- 40-49
- 50-59
- 60+

11.) What was the last level of schooling you completed?

- Less than high school graduate
- High school graduate
- Some college
- College graduate
- Post graduate

12.) In which of the following ranges does your total household income fall?

- \$11,999 and below
- \$12,000 - \$19,999
- \$20,000 - \$29,999
- \$30,000 - \$39,999
- \$40,000 - \$49,999
- \$50,000 - \$75,000
- Above \$75,000

13.) Do you have children living at home?

- Yes
- No

14.) What is your zip code? _____

Appendix C : Survey C

Consumer Demand for Wild Caught Sustainable Shrimp

This study is being conducted by a Duke University graduate student to get a better understanding of demand for sustainably harvested American shrimp. The information in the survey will be used to inform non profit groups developing methods to sustainably harvest shrimp. The information is also to be used for a basis for a graduate thesis. There are questions about shrimp consumption. There are also some questions that ask for relevant information about you, such as your income range and family size. You will not be ask to give your name. Your responses to the questions cannot be connected to your name. This survey should take about 15 minutes to complete. Participation in the survey is voluntary and all information will be kept confidential. You may stop taking the survey at any time and you may skip any questions you do not feel comfortable answering. Participants must be 18 or older. Thank you for your help.

1.) How often do you purchase shrimp?

- More than once a week
- Once a week
- Two times a month
- Once a month
- Less than once a month

2.) Where do you usually eat shrimp?

- At home
- In a restaurant

3.) Please circle from one to five, one being the least important, five being the most important, the following factors you consider when purchasing shrimp. You can circle the same number more than once

a. price	1	2	3	4	5
b. flavor	1	2	3	4	5
c. size	1	2	3	4	5
d. whether it is American or imported	1	2	3	4	5
e. whether it is wild caught or farmed	1	2	3	4	5

Of the factors listed above, which is the most important, **please fill in the letter** _____

4.) How much do you know about the following? Please rank from 1 to 5, 1 being the lowest, 5 being the highest. You can circle the same number more than once

- g. The amount of other fish caught when fishing for shrimp

1	2	3	4	5
---	---	---	---	---
- h. The effect of shrimp nets on the ocean floor

1	2	3	4	5
---	---	---	---	---
- i. The difference between farm raised and wild caught shrimp

1	2	3	4	5
---	---	---	---	---

5.) Are you concerned about the way in which shrimp is harvested?

- yes
- no

	Shrimp A	Shrimp B
Price	\$7 per pound	\$9 per pound
Where it is From	Abroad	America
Label?	No	Yes

6.) Which would you rather purchase?

- A
- B

	Shrimp A	Shrimp B
Price	\$7 per pound	\$7 per pound
Where it is From	Abroad	America
Label?	No	Yes

7.) Which would you rather purchase?

- A
- B

8.) If you had a larger income, would you pay more for American shrimp than for shrimp caught abroad?

- Yes
- No

9.) Would you spend more on shrimp that has an “environmentally friendly label?”

- Yes
- No

Background Information

10.) What is your age?

- 18-29
- 30-39
- 40-49
- 50-59
- 60+

11.) What was the last level of schooling you completed?

- Less than high school graduate
- High school graduate
- Some college
- College graduate
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12.) In which of the following ranges does your total household income fall?

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- \$12,000 - \$19,999
- \$20,000 - \$29,999
- \$30,000 - \$39,999
- \$40,000 - \$49,999
- \$50,000 - \$75,000
- Above \$75,000

13.) Do you have children living at home?

- Yes
- No

14.) What is your zip code? _____

