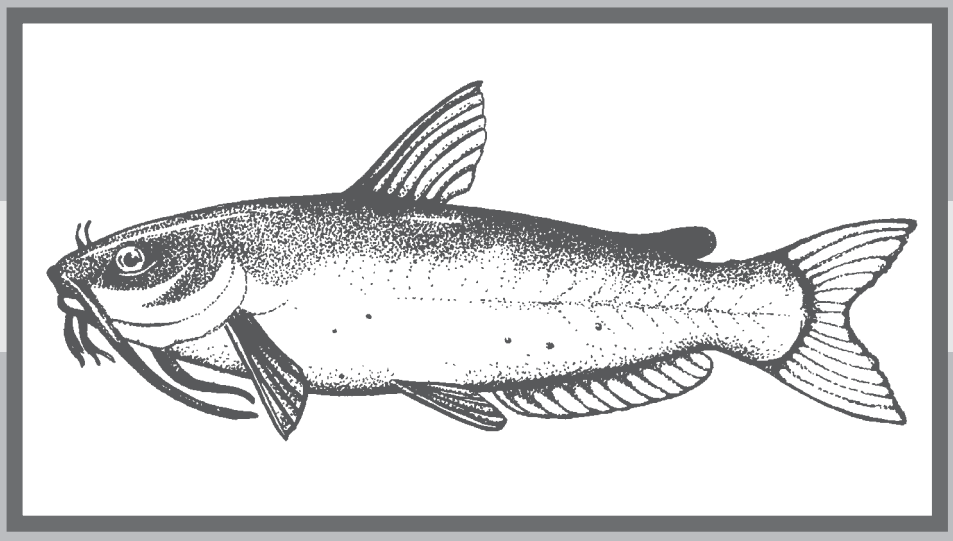
BULLETIN 1134 JULY 2003

Opinions

OF U.S. CONSUMERS ABOUT FARM-RAISED

Catfish:



RESULTS OF A

2000-2001

SURVEY

Experiment Station
Vance H. Watson, Director

Mississippi Agricultural & Forestry Experiment Station
J. Charles Lee, President • Mississippi State University • Vance H. Watson, Interim Vice President

Opinions of U.S. Consumers About Farm-Raised Catfish: Results of a 2000-2001 Survey

Lisa House
Associate Professor
Department of Food and Resource Economics
University of Florida

Terrill Hanson
Associate Professor
Department of Agricultural Economics
Mississippi State University

S. Sureshwaran
National Program Leader
Higher Education Programs
Cooperative State Research, Education, and Extension Service, USDA

Haile Selassie
Professor
Department of Agribusiness and Economics
South Carolina State University

This material is based upon work supported by the Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture, under Agreement No. 99-38814-8202. It is a result of research sponsored in part by the National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce under Grant #GMO-99-24, the Mississippi-Alabama Sea Grant Consortium, Mississippi State University, and University of Florida. The U.S. Government and the Mississippi-Alabama Sea Grant Consortium are authorized to produce and distribute reprints notwithstanding any copyright notation that may appear hereon. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of NOAA or USDA. For more information, contact Dr. Hanson by telephone at (662) 325-7988 or by e-mail at hanson@agecon.msstate.edu. Bulletin 1134 was published by the Office of Agricultural Communications, a unit of the Division of Agriculture, Forestry, and Veterinary Medicine at Mississippi State University.

ABSTRACT

This bulletin presents results from a 2000-2001 fish and seafood consumption survey and should be of interest to the catfish industry, government agencies, and seafood retailers/marketers. Survey results identify characteristics and opinions of catfish consumers and nonconsumers. Of a sample of 1,416 respondents to a nationwide mail survey on seafood consumption, 53% consumed catfish at least occasionally, with an average catfish consumer eating catfish 3.3 times per month. Consumers indicated a greater preference for farm-raised catfish than for wild-caught catfish, but they placed farm-raised products low on their lists of factors that would increase their consumption of catfish.

Reasons for eating catfish included enjoyment of flavor (68% of consumers), health and nutrition (31%), and addition of variety to their diets (22%). Catfish consumers identified the main reasons for not consuming catfish more often as price (22%), lack of fresh product availability (16%), lack of preparation knowledge (14%), and time-consuming preparation (13%). Two factors would prompt respondents located in "nontraditional" catfish consumption regions of the U.S. to eat more catfish: (1) continuous availability of a good product and (2) wide availability of a variety of ready-to-eat products. When asked what would increase their consumption of catfish, respondents who indicated price, time-consuming preparation, and lack of availability of fresh product were most likely to indicate factors that could increase their consumption level.

Nonconsumers had different reasons for not consuming catfish, mainly taste, texture, smell, and lack of preparation knowledge. As flavor was the most important reason consumers ate catfish, it also appeared to be the biggest reason why nonconsumers do not eat catfish. Lack of preparation knowledge was also an important reason for this group. Nonetheless, 30% of nonconsumers said they would try farm-raised catfish when they were provided with an anonymous description of a farm-raised finfish product that was taken from an U.S. farm-raised catfish advertisement.

Keywords: U.S. farm-raised catfish, consumer attitudes, marketing, consumption, nonconsumers

Opinions of U.S. Consumers About Farm-Raised Catfish: Results of a 2000-2001 Survey

Introduction

This bulletin presents results from a 2000-2001 fish and seafood consumption survey and should be of interest and use to the catfish industry, government agencies, and seafood retailers/marketers. Sales of U.S. farm-raised catfish increased during the 1990s and decreased in 2001 while per-capita consumption has steadily increased during this same period (USDA/NASS, 2002; Hanson and Sites, 2002). Producers, processors, and marketers of catfish are faced with new opportunities and challenges during these volatile times that have seen up-and-down sales volume, low producer and processor prices, and increased fish supplies resulting from low prices, high inventories, and additional imported fish fillets selling as "catfish."

Knowing who does and does not consume catfish, why they choose this behavior, and why they do not consume more can be beneficial to those developing strategies to increase sales. Additional information on consumers' perceptions of the farm-raised catfish product, safety, nutrition, price, and availability can be important to the industry in developing and expanding catfish markets. Therefore, these results should be helpful to the catfish industry in their efforts to target new consumers and increase sales to current consumers.

This publication presents results by catfish consumer and nonconsumer categories and examines each group's characteristics, attitudes, perceptions, and potential for increased consumption. Targeting existing consumers for increased sales is called market penetration, while targeting nonconsumers for consumption is termed market development. This study provides consumer information that the catfish industry can use to address market penetration and development.

Background

The consumption of seafood, including farm-raised catfish, has become an important part of the diet for consumers in the United States. Although the average quantity of seafood consumption in the U.S. is not as high as beef and chicken, seafood consumption has generally been constant during the 1990s to present (Figure 1). U.S. per-capita seafood consumption increased from 11.8 pounds in 1970 to a high of 16.2 pounds in 1987. Per-capita seafood consumption in 2000 was 15.6 pounds and dropped to 14.8 pounds in 2001 (USDOC/NOAA/NMFS, 2002). This recent decline in consumption has been attributed to recession fears and a drop in restaurant dining following the September 11, 2001, terrorist attack (NFI, 2002).

Fresh and frozen seafood products currently account for 67% of seafood consumption, compared with 57-60% in the 1970s (USDOC/NOAA/NMFS, 2002). Canned seafood products account for 31% of seafood

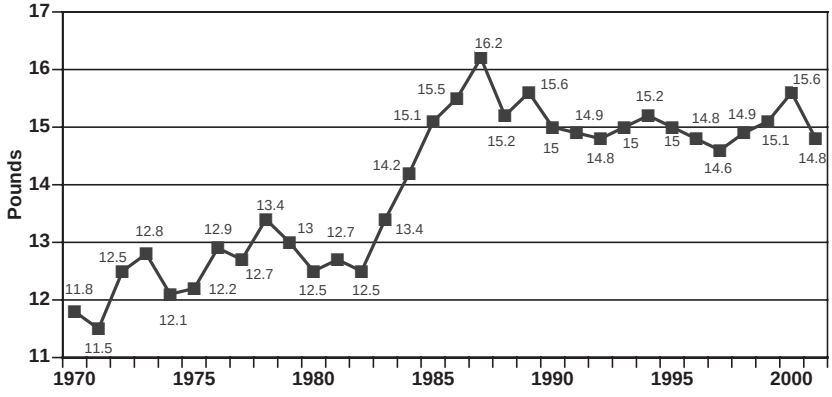


Figure 1. U.S. Per-Capita Consumption of Fish and Shellfish Products, 1970-2001 (Source: USDOC/NOAA/NMFS, Fisheries of the U.S. 2001, September 2002).

consumption, and cured fish products account for 2% of consumption. Among the fresh and frozen seafood products, finfish consumption increased from 4.5 pounds in 1970 to a high of 10.7 pounds in 1987 (USDOC/NOAA/NMFS, 2002). Finfish consumption in the 1990s ranged from 5.9 to 6.4 pounds per capita.

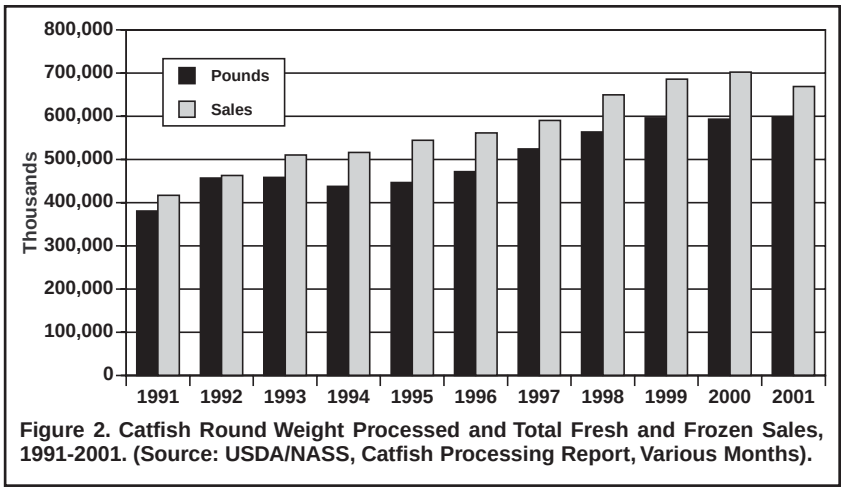


Figure 2. Catfish Round Weight Processed and Total Fresh and Frozen Sales, 1991-2001. (Source: USDA/NASS, Catfish Processing Report, Various Months).

According to the National Agricultural Statistical Services (USDA/NASS Catfish Processing Reports, various months), catfish consumption has dramatically increased over the past decade (Figure 2). Processed weight has increased from 381 million to 597 million pounds — a 57% increase — between 1991 and 2001, and fresh and frozen sales have increased from $417 million to $658 million during the same period (USDA/NASS Catfish Processing Reports, various months). Per-capita consumption of catfish increased from 0.41 pounds in 1985 to 1.15 pounds in 2001, an increase of 180% (NFI, 2002; Mississippi State University Extension Service, 2002).

U.S. Farm-Raised Catfish Industry

The raising of catfish in controlled pond environments (i.e., aquaculture) began in the South Central U.S. during the late 1960s and early 1970s in response to low crop prices and the desire to find a better use for marginal farmland (Tucker and Robinson, 1991). Catfish are produced through a farming process that controls the growing environment from the breeding stage through the egg, fry, fingerling, and grow-out stages until a 1.5- to 2-pound catfish is produced for harvest. Harvested catfish are processed into fresh and frozen product forms, including whole, fillet, nugget, strip, and steak products. Consumers found that farm-raised catfish products have a mild and appealing flavor, most likely because of the grain-based feed used in catfish production. With the increasing demand and the processing evolution from manual to mechanical filleting, the industry grew dramatically during the 1980s. In 1986, The Catfish Institute (TCI) was created by the industry to promote and advertise U.S. farm-raised catfish; TCI is funded by a voluntary fee placed upon every ton of catfish feed sold. The industry's growth has been facilitated by the development of support industries and university research programs addressing critical issues of fish nutrition, feeds, diseases, genetics, water quality, and economics.

Presently, the catfish industry is the largest aquaculture industry in the U.S. In 1999, 635 million pounds of farm-raised catfish were processed at a sales value of $465 million. This production came from 196,000 water acres primarily located in Mississippi, Arkansas, Alabama, and Louisiana. In Mississippi, the farm-raised catfish industry produced close to 400 million pounds in 2001 valued at approximately $300 million. In the Delta region of Mississippi, the farm-raised catfish industry employs approximately 3,000 in the farming sector, 4,000 in the processing sector, and 500 in the feed sector — representing an annual payroll of more than $100 million and an investment value of approximately $640 million (Dean, Hanson, and Murray, 2003). For the agricultural Delta region of Mississippi, the catfish industry has provided alternative income sources for its farming population and jobs and incomes for many others through support industries.

The next largest U.S. aquaculture industries are salmon (pen-raised; 39 million pounds produced with a sales value of $77 million), trout (raceway- and pond-raised; 60 million pounds with sales of $65 million), baitfish (pond-raised; 16 million pounds with sales of $57 million), and oysters (bag- or raft-cultured; 19 million pounds with sales of $56 million). Catfish has become the number five preferred fish and seafood product in the U.S., behind shrimp, canned tuna, salmon, and pollock (NFI, 2002).

DATA AND PROCEDURES

The data for this study were obtained through a mail survey (Appendix 1). Before the survey instrument was prepared, a number of focus groups were conducted in South Carolina, Mississippi, and Kansas to elicit issues to be addressed in a fish and seafood consumption survey. Results from these focus groups were used to develop categories for the questionnaire, as well as test questions and phrasing of questions. The questionnaire was then mailed to a sample of 9,000 households in the United States, with 1,000 mailed to each of the nine major U.S. census regions (Table 1). The stratified sample was chosen because region was expected to be a significant determinant of both the choice to consume and the choice of how often to consume catfish. Surveys were mailed in late 2000 and early 2001. If households did not return the first survey, a second copy of the survey was sent. A total of 1,790 surveys, or 20.1%, were returned (after accounting for "wrong address" returned surveys). Of these responses, 1,416 (79%) responded to the questions regarding catfish. The information obtained from these 1,416 responses is summarized in this bulletin. Overall, 53% of the 1,416 respondents indicated that they consumed catfish.

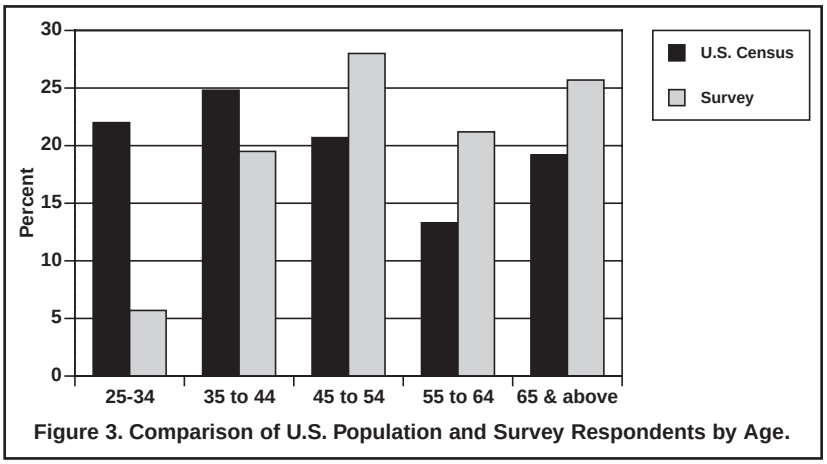


Figure 3. Comparison of U.S. Population and Survey Respondents by Age.

The demographic data collected indicated that the response rate per region was comparable, ranging from 134 usable responses from the East South Central region to 177 responses from the Mountain region (Table 1). Responses did appear to be biased toward Caucasians, with 84.1% of the respondents indicating they were Caucasian, 3.1% Black or African-American, 2% Asian, 1.8% Hispanic, and 5.3% other (3.7% of the respondents did not answer this question). The 2000 U.S. Census indicates that approximately 75% of the U.S. population is Caucasian, with 12.5% Hispanic, 12.3% Black or African-American, and 3.6% Asian.

As shown in Figure 3, respondents to this survey over-represented older age groups. Considering only the U.S. population above the age of 25 years, 53% of the adult population in the U.S. is above the age of 45, compared with 75% of the respondents to the survey. Figure

Table 1. Region of Residence of Survey Respondents.

Region	States in region	Number of respondents	Pct. respondents who live in each region
New England	Maine, Rhode Island, New Hampshire, Massachusetts, Vermont, Connecticut	161	11.7
Mid-Atlantic	Pennsylvania, New York, New Jersey	140	10.1
Southeast Atlantic	Florida, Georgia, North Carolina, South Carolina, West Virginia, Virginia, Maryland, Delaware, Washington D.C.	155	11.2
East North Central	Ohio, Indiana, Illinois, Michigan, Wisconsin	154	11.2
East South Central	Kentucky, Mississippi, Tennessee, Alabama	134	9.7
West North Central	Iowa, Minnesota, South Dakota, North Dakota, Missouri, Kansas, Nebraska	175	12.7
West South Central	Texas, Oklahoma, Arkansas, Louisiana	145	10.5
Mountain	Nevada, New Mexico, Arizona, Utah, Wyoming, Colorado, Montana, Idaho	177	12.8
Pacific	Alaska, Hawaii, California, Oregon, Washington	140	10.1
Total	All States	1,416	100.0

4 is a comparison of household income for survey respondents compared with that obtained by the U.S. census. Survey respondents tended to have slightly higher household incomes than those from the U.S. census data. The mean income of survey respondents was in the $50,000 - $59,999 category compared with a U.S. mean income of $42,148. (Figure 4 uses U.S. census income categories; however, the actual survey question had more detailed income categories and hence gave a better income distribution for analyses, but for comparison's sake the survey data is presented in census categories). Additionally, respondents to the survey tended to have higher formal education, with 47.7% of the survey sample having some form of college degree compared with 26% of the U.S. population. Religious composition of the survey respondents corresponds with the *World Almanac and Book of Facts* (1999), which reports that approximately 85% of the U.S. population practice Christianity (including 23% Catholic), 2% practice Judaism, and 1% practice Islam. Our survey results indicated 83% of respondents practiced Christianity (25% Catholic) and 3% practiced Judaism.

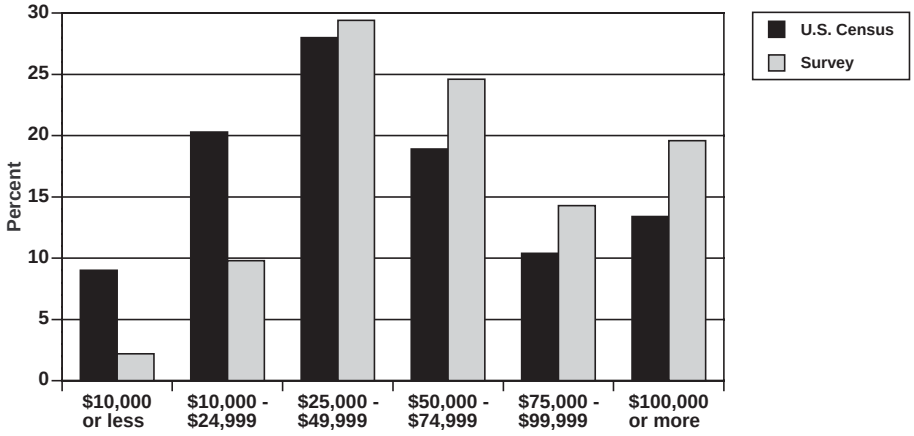


Figure 4. Comparison of U.S. Population and Survey Respondents by Household Income.

RESULTS

Catfish Consumption

Consumers were asked to identify how often they consumed catfish both at home and away from home for breakfast, lunch, and dinner. Table 2 shows the frequency a consumer eats catfish for each of these meals. Average consumption of the 752 catfish consumers responding to this question was 3.26 times per month.

Respondents were also asked where they purchased fish and shellfish. Eighty-four percent of respondents shopped for seafood in grocery stores, 86% purchased seafood at restaurants, 22% consumed seafood that was recreationally caught, and 24% purchased seafood at specialty stores (such as gourmet stores or fish markets). There were no significant differences between catfish consumers and nonconsumers for purchases of seafood at the grocery store. However, catfish consumers were more likely to purchase seafood at restaurants (89% of catfish consumers compared with 80% of nonconsumers), and 26% of catfish consumers consumed recreational catch, compared with 15% of nonconsumers. There was a small difference between catfish

Table 2. Frequency of Catfish Consumption.[1]

Level of consumption	Breakfast		Lunch		Dinner	
	Home	Away	Home	Away	Home	Away
	%	%	%	%	%	%
2-3 times per week[2]	0.0	0.1	0.1	0.1	0.2	0.5
1 time per week	0.8	0.1	1.3	1.7	2.8	1.8
More than once a month but less than weekly	1.8	0.4	5.7	6.7	10.2	11.1
Infrequently (< 1 time per month)	7.0	2.8	15.7	26.7	24.3	31.8
Never	90.4	96.6	77.1	64.8	62.4	54.8

[1]n=1,416 respondents; values indicate percent of respondents who indicated the level of consumption for the meal occasion.
[2]There were no respondents who answered daily or four to six times per week consumption of catfish for any meal occasion.

consumer and nonconsumer purchases at seafood specialty stores — 26% and 21%, respectively.

Demographics for catfish consumers versus nonconsumers are presented in Table 3. Catfish consumption did vary by region of residence, with consumers in the West South Central and East South Central regions most likely to consume catfish (Figure 5). Overall, 84% of the respondents from the West South Central region consumed catfish, compared with the low of 26% in the New England region. Other demographic variables that significantly differed between consumers and nonconsumers of catfish

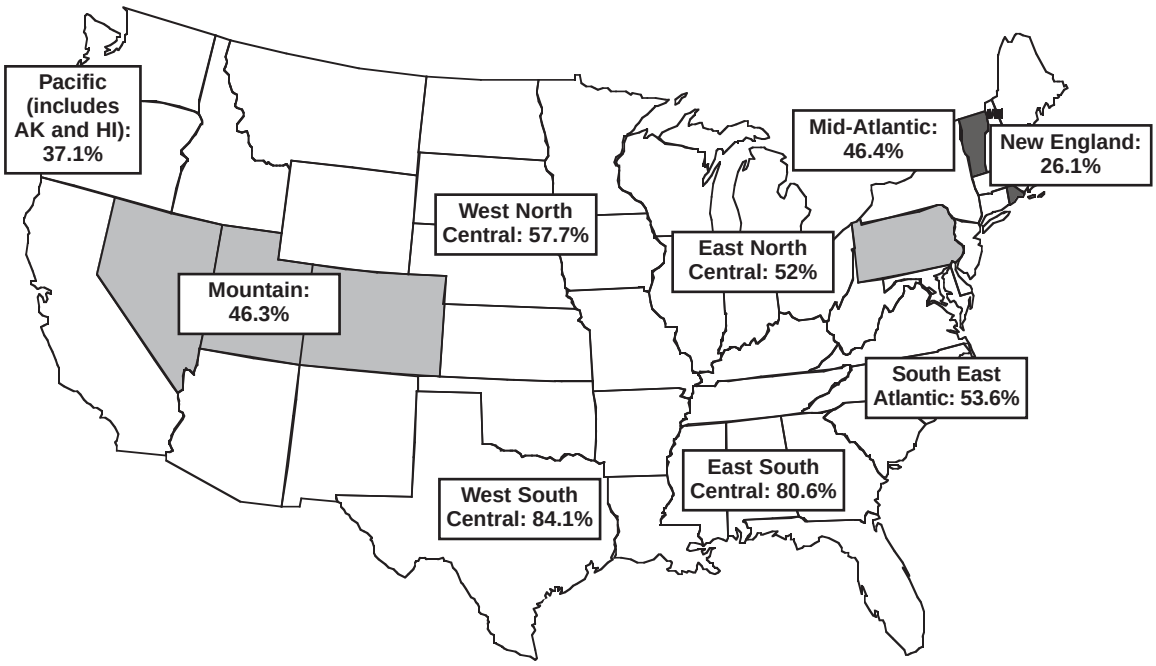


Figure 5. Regional Percentage of Respondents Consuming Catfish (Chi-square probability = 0.001).

Table 3. Summary of Demographics Comparing Catfish Consumers with Nonconsumers.

Demographic	Nonconsumers	Consumers	Demographic	Nonconsumers	Consumers
	%	%		%	%
Age of Respondent			**Ethnicity**		
Older than 65	25.2	25.5	Caucasian	90.4	84.6
Between 50 and 65	35.5	34.3	Non-Caucasian	9.6	15.4
Between 35 and 50	32.4	33.4			
Under 35	6.9	6.8	**Region of Residence**		
			New England	18.4	5.7
Gender			Mid-Atlantic	11.6	8.8
Percent male	42.9	39.5	Southeast Atlantic	11.2	11.3
			East North Central	11.5	10.9
Household Income			East South Central	4.0	14.7
Less than $29,999	16.8	15.5	West North Central	11.5	13.7
Between $30,000 and $59,999	36.2	37.0	West South Central	3.6	16.6
Between $60,000 and $99,999	27.1	28.1	Mountain	14.7	11.2
$100,000 or more	19.9	19.4	Pacific	13.6	7.1
			Lives within 50 miles of coast	39.4	22.6
Education					
High school or less	22.0	20.6	**Religion**		
Some college	19.8	22.9	Catholic	28.7	22.0
College degree(s)	58.2	56.5	Christian	51.1	63.7
			Other	20.2	14.3

included religion (Figure 6) and percent Caucasian. Chi-squared tests on significance are included for each figure. Chi-square probabilities below 0.05 indicate a significant difference in the variables. For example, in Figure 5, the chi-square probability of 0.001 indicates catfish consumption is significantly different in the different regions.

Survey respondents were asked if they had ever consumed farm-raised catfish, and they were asked to express their opinions about these catfish products. Nearly all catfish consumers (more than 98%) were aware they had eaten farm-raised catfish. Of those who were aware they had eaten farm-raised catfish, 94% indicated they would eat farm-raised catfish again. Of those who had not eaten farm-raised catfish, 38% indicated they would be willing to try farm-raised catfish.

Catfish consumers were asked to identify what product forms they purchased for home consumption (Figure 7). Approximately 22% of consumers indicated they did not purchase catfish for home consumption. Home consumption was slightly weighted toward consumption of fresh catfish (61% of consumers) over frozen catfish (53% of consumers). Most commonly, consumers preferred fillets. Fifty-two percent of consumers indicated they ate fresh fillets at home, while 44% ate frozen fillets at home.

Consumers were also asked to identify which of seven finfish and four shellfish products (tuna, pollock, salmon, cod, catfish, flounder/sole, halibut, shrimp, clams, crabs, and oysters) they felt were the least and the most safe to eat. Approximately 13.5% of catfish consumers felt catfish was the safest product, and 2% felt it was the least safe. Only 3.5% of nonconsumers identified catfish as the least safe seafood or fish product. By comparison, 22% considered tuna safest, 37% considered oysters the least safe, and 10% considered clams the least safe. Overall, product safety concerns appeared to be low for catfish. Only 7% of respondents (both catfish consumers and nonconsumers) indicated product safety concerns were a reason for not consuming (or not consuming more frequently) farm-raised catfish.

Respondents were asked whether food inspection and safety programs would increase consumption of seafood in general. Respondents were given descrip-

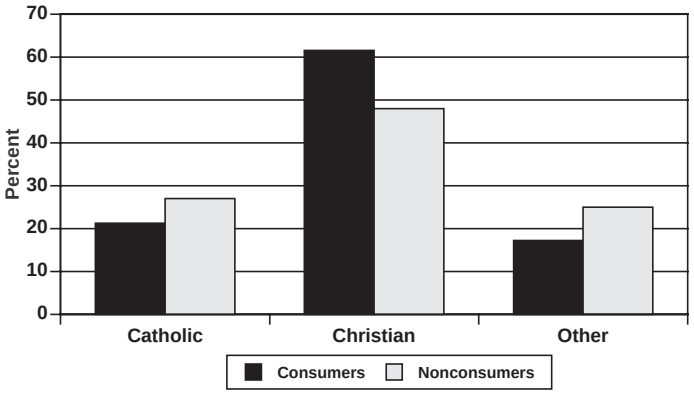


Figure 6. Percent of Respondents Who Consume Catfish According to Religious Affiliation. (Chi-square probability = 0.001.)

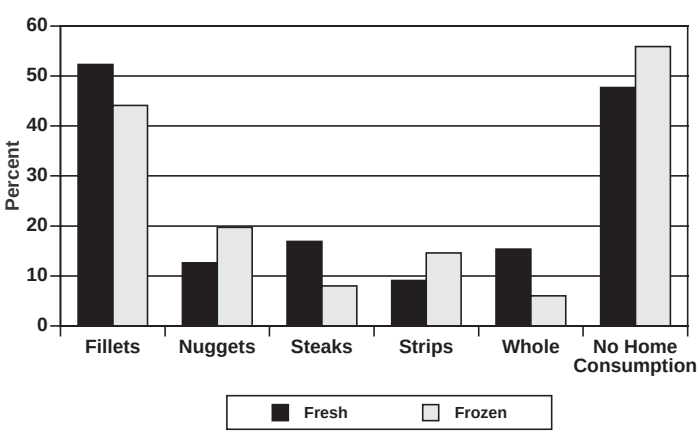


Figure 7. Comparison of Product Form Preferred by Catfish Consumers for At-Home Consumption.

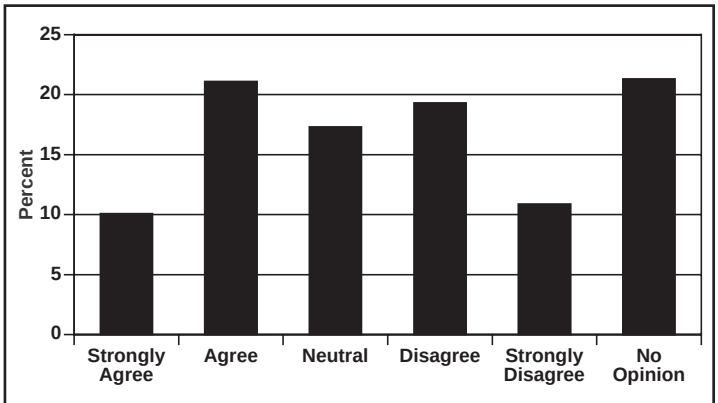


Figure 8. Percent of Catfish Nonconsumers Willing to Try a Finfish Product Based on the U.S. Farm-Raised Catfish Description.

tions of HACCP (Hazard Analysis of Critical Control Points), USDA visual inspection, and third-party certification programs in lay terms. Overall, 55% of respondents indicated government visual inspection would increase consumption, 42% indicated third-party certification would increase consumption, and 15% indicated HACCP would increase consumption. Some respondents indicated that safety programs would decrease consumption. Twenty-six percent of respondents indicated a HACCP program would decrease their consumption of seafood, while 8% and 3% of respondents indicated third-party certification and government inspection programs, respectively, would decrease their consumption of seafood.

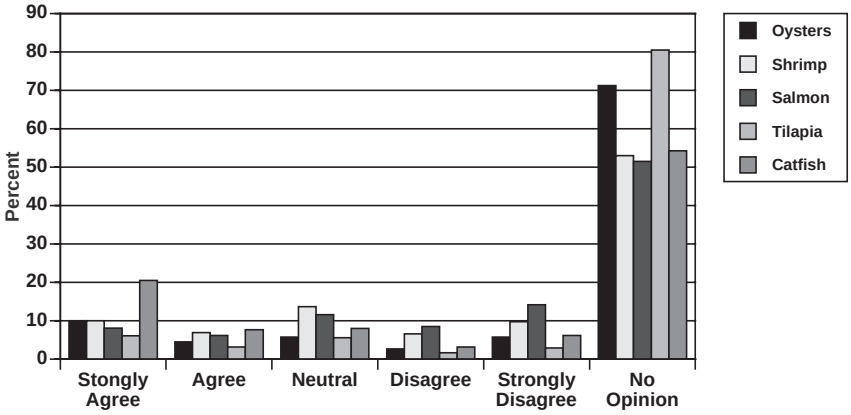


Figure 9. Level of Agreement with the Statement, "I Prefer Farm-Raised to Wild-Harvested _____."

Only 6% of respondents said they were aware of HACCP, so while the results presented previously are valid, the lack of confidence in HACCP may not be indicative of people knowledgeable of this program.

A catfish industry advertisement described farm-raised catfish as ". . . fillets having a firm texture with a mild, slightly nutty flavor. Fillets are guaranteed boneless and lack the fishy odor associated with some fish products. Because the fish is farm-raised, fresh product is available year-round and is raised in a quality-controlled environment with stringent control measures (including taste testing)." This description was placed in a survey question without identifying the fish as catfish, and respondents were asked to identify their willingness to purchase such a farm-raised finfish (Appendix 1, question 12). Results from this question showed that 31% of catfish nonconsumers agreed or strongly agreed that they might purchase this described product (Figure 8). This is very encouraging that so high a percentage of nonconsumers are potential catfish consumers, and further analysis should be conducted to determine who these potential buyers are. There were also about 31% of catfish nonconsumers who reported that they would not try the "described" fish. Further analysis on this group could be conducted to determine which people are not likely to consume catfish. Such information would aid in tailoring marketing efforts.

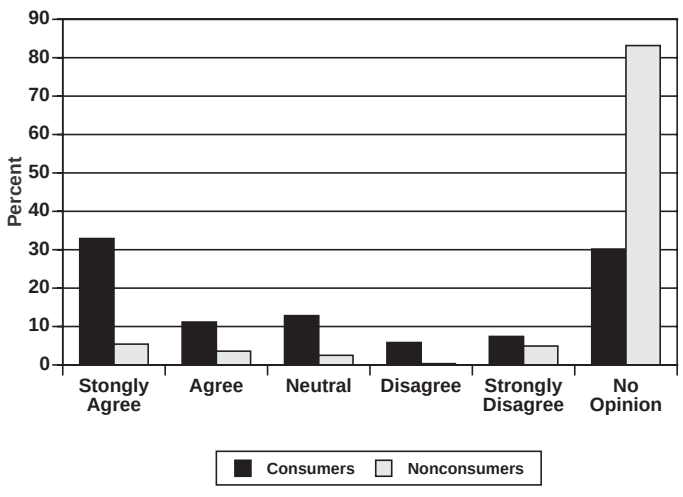


Figure 10. Comparison Between Catfish Consumers and Nonconsumers Relative to the Level of Agreement with the Statement, "I Prefer Farm-Raised to Wild-Harvested Catfish."

Respondents were also asked to rate whether they preferred farm-raised or wild-harvested seafood for five different species (catfish, tilapia, salmon, oysters, and shrimp; Appendix 1, question 15). Responses are shown in Figure 9. Regardless of species, the majority of people had no opinion for all species with a higher "no opinion" rate for oysters and tilapia. However, 20% of respondents strongly agreed with this statement for farm-raised catfish, double the response rate for any other product. There was an opposite effect for salmon with respondents stating a higher preference for wild-caught salmon over cultured salmon. There were significant differences for catfish consumers and nonconsumers, with the former more likely to have an opinion on catfish (Figure 10).

Reasons for Consumption and Nonconsumption

In addition to the frequency of consumption and the demographic variables, respondents were asked to identify reasons for their consumption of catfish. Results from the 752 catfish consumers who responded to this question are presented in Figure 11. As indicated by more than 67% of consumers, the principal reason for consuming catfish was enjoyment of flavor. Next was health and nutrition, followed by variety to diet, price, and availability of fresh product.

Both consumers and nonconsumers were asked to identify the top reasons for either their lack of consumption or infrequent consumption of catfish (Figure 12). For nonconsumers, taste, smell, lack of preparation knowledge, and texture were the top four reasons. Consumers gave significantly different responses: price, lack of availability of fresh product, lack of preparation knowledge, and time-consuming preparation.

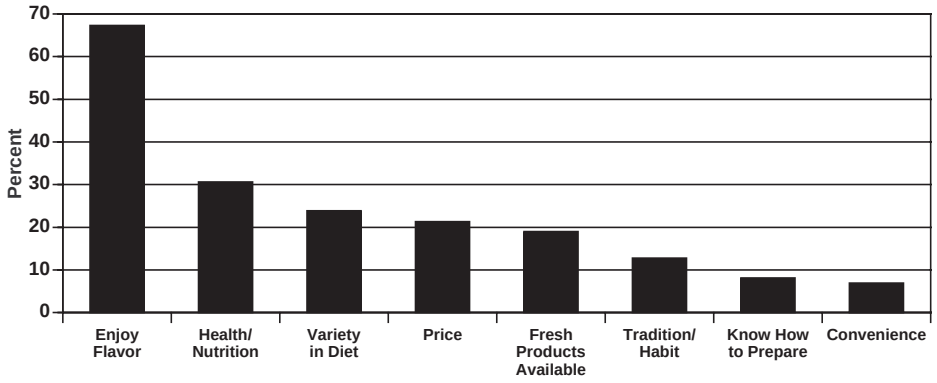


Figure 11. Categories of Greatest Response to Reasons Why Catfish are Consumed (Only Catfish Consumers are Reported).

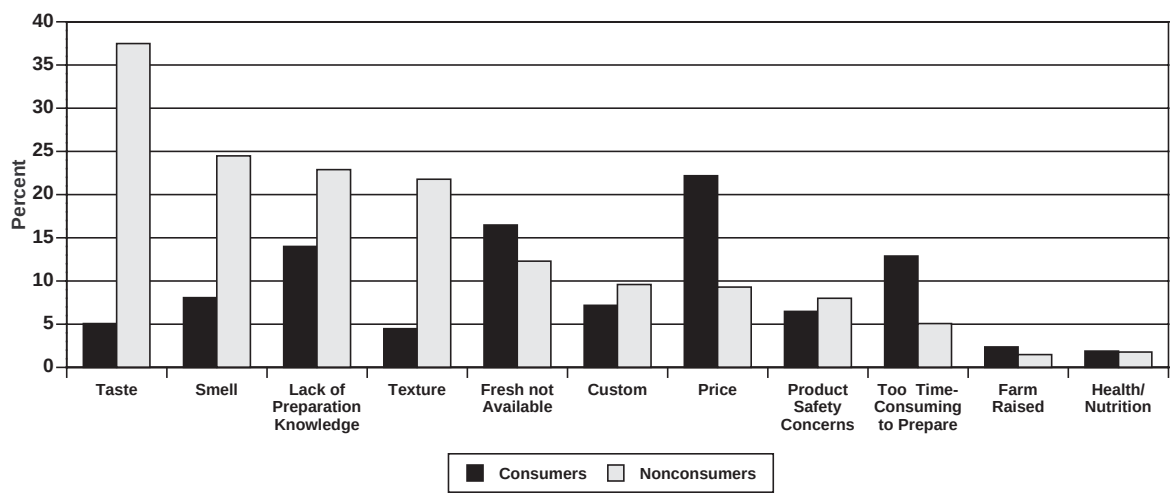


Figure 12: Categories of Greatest Response to Reasons Why Catfish are Not Consumed or Not Consumed More Frequently.

Increasing Consumption

Respondents were asked to identify factors that might increase their consumption of catfish. Choices included recipes, coupons, company quality guarantee, company safety guarantee, government safety inspection, nutritional information, doctor's recommendation, packaging (convenience/microwavable), availability of quality products, information on production processes, and lower prices (Appendix 1, question 16). The percent of respondents who indicated these factors would increase consumption are presented in Figure 13. Overall, 39% of the respondents did not select any of the 11 factors, indicating none of the above reasons would increase their consumption. Nonconsumers of catfish were more likely to indicate nothing would increase their consumption (61% of nonconsumers) compared with catfish consumers (20% indicated nothing would increase their consumption). The likelihood of factors or reasons indicating that nothing would increase catfish consumption was also significantly tied to reasons for not increasing catfish consumption (Appendix 1, questions 14 and 16; Table 4). Those who indicated taste, texture, and smell as reasons for not consuming (or not increasing consumption of) catfish were less likely to be convinced to increase their catfish consumption than those who indicated inhibitory consumption factors of custom, preparation knowledge, product safety, nonavailability of fresh product, preparation time, or price. Many of these latter concerns could be addressed by the catfish industry and could increase catfish demand, consumption, and sales.

Table 4. Relationship Between Reasons for Not Consuming Catfish and Indicating Factors that Would Increase Consumption of Catfish.

Reason for not consuming catfish	Likelihood anything would . . .	
	NOT increase consumption	Increase consumption
	%	%
Taste	65	35
Texture	62	31
Smell	52	22
Custom	28	6
Lack of preparation knowledge	25	12
Product safety concerns	22	4
Fresh product not available	15	6
Too time-consuming to prepare	14	3
Price	12	5

For catfish consumers, the primary factor that could increase consumption was a lower retail price (Figure 13). The next group of factors that could lead to

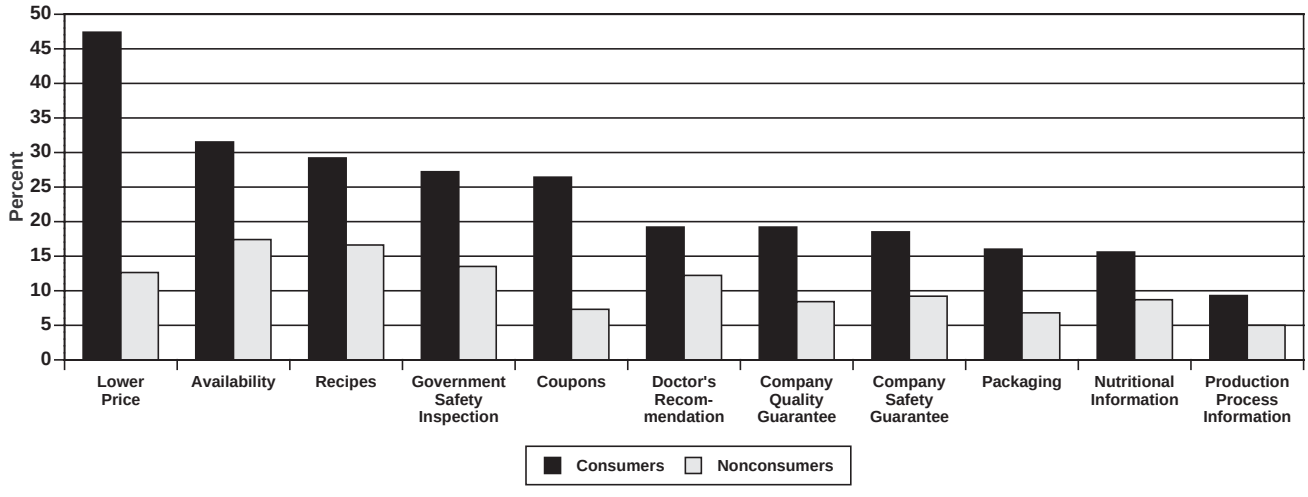


Figure 13. Factors that Respondents Indicated Would Increase Their Consumption of Catfish.

increased catfish consumption was availability of fresh product, recipes, government safety inspection programs, and coupons (discounts on retail price). A third tier of factors that could increase catfish consumption was doctor's recommendation, company quality and company safety guarantees, packaging method, and nutritional information. The factor selected by the fewest respondents — both consumers and nonconsumers — was information on the catfish production process.

A majority (59%) of catfish consumers who indicated that lack of preparation knowledge deterred consumption indicated that recipes would increase their consumption. Of consumers who indicated price was a deterrent to consumption, 75% reconfirmed that a lower price would increase consumption, as opposed to only 39% who supported coupons. The majority (66%) of catfish consumers who indicated lack of availability of fresh products as a reason for not consuming more frequently indicated the availability of fresh products would increase their consumption.

Another relationship was found in the information on food safety programs. Of the respondents who indicated the government safety inspection program would increase consumption of seafood in general (Appendix 1, question 10), only 28% indicated that government safety inspection would increase their consumption of catfish.

CONCLUSIONS

The results of this survey identified characteristics and opinions of catfish consumers and nonconsumers that can be used to develop market segments and better understand consumer attitudes toward farm-raised catfish. Of a sample of 1,416 respondents to a nationwide mail survey on seafood consumption, 53% consumed catfish at least occasionally. The average catfish consumer ate catfish 3.3 times per month. This bulletin provides a summary of the data collected and can be used to provide general directions for the catfish industry, government agencies, and seafood retailers/marketers. Further econometric data analysis is needed for specific recommendations. A potential limitation of this report is that respondents to the survey were mainly seafood consumers. Sociodemographic data indicated respondents were slightly older and wealthier than U.S. averages, as well as more educated than the national average. Although most respondents were seafood consumers, we believe this not to be a major limitation because only 53% of the respondents ate catfish.

Results of an econometric study (Drammeh, House, Sureshwaran, and Selassie, 2002) indicate that there are statistically significant differences among the reasons why people choose to eat catfish and the reasons why catfish consumers choose how often to eat catfish. Therefore, this study divides the data into consumers of catfish and nonconsumers and examines their characteristics. This study provides guidance toward addressing the challenges confronted by the catfish industry, which is pursuing both market penetration (catfish consumers) and development (nonconsumers) to increase sales.

Reasons for eating catfish included enjoyment of the flavor (68% of consumers), health and nutrition (31%), and addition of variety to the diet (22%). Catfish consumers identified the main reasons for not consuming catfish more often as price (22%), lack of fresh product availability (16%), lack of preparation knowledge (14%), and time-consuming preparation (13%). Respondents located in "nontraditional" catfish consumption regions of the U.S. would eat more catfish if a good product was continuously available and a variety of ready-to-eat products were widely available.

Consumers indicated a greater preference for farm-raised catfish than for wild-caught catfish, but they placed farm-raised product low on their lists of factors that would increase their consumption of catfish. Although this is only conjecture, it may be that TCI efforts to inform the public about the quality standards assured by the farming of catfish in controlled aquatic environments may have paid off. TCI has included the farm-raised theme in their U.S. catfish advertising print campaigns from the beginning, and consumers seem to have accepted this production process as superior to other supplies of catfish (Hanson, 2002).

Finally, consumers were asked what would increase their consumption of catfish. Respondents who cited price, time-consuming preparation, and lack of availability of fresh product as barriers to consumption were most likely to indicate factors that could increase their consumption level. As expected, consumers indicated a lower price would increase their frequency of consumption, but other factors, such as availability of fresh products, recipes, government

safety inspection, and coupons, also were indicated as factors that might increase consumption for at least 25% of consumers.

Nonconsumers had different reasons for not consuming catfish, mainly taste, texture, smell, and lack of preparation knowledge. As flavor was the most important reason consumers ate catfish, it also appears to be the biggest reason why nonconsumers do not eat catfish. Lack of preparation knowledge is again important. Although it is less likely the industry would persuade nonconsumers to eat catfish (more than 50% of people who indicated taste, smell, and texture as reasons for not consuming indicated nothing could increase their consumption level), methods such as recipes could still be helpful. Changing nonconsumer perceptions of taste, smell, and texture is likely more difficult to change than factors of preparation knowledge or price.

Similar bulletins of U.S. consumer opinions and attitudes toward oysters, shrimp, and tuna will be available soon.

REFERENCES

Dean, S., T. Hanson, and S. Murray. 2003. "Economic Impact of the Mississippi Catfish Industry in 2002." Extension Publication 2317. Mississippi State University Extension Service.

Drammeh, L., L. House, S. Sureshwaran, and H. Selassie. 2002. "Analysis of Factors Influencing the Frequency of Catfish Consumption in the United States." Selected Paper presented at the Annual Meetings of the American Agricultural Economics Association, Long Beach, California.

Hanson, T.R. 2002. "Marketing Strategies of The Catfish Institute, 1985-2001." Department of Agricultural Economics Staff Report 2002-004. Mississippi State University. (http://www.agecon.msstate.edu/Research/papers.php?l=62).

Hanson, T.R., D. Sites. 2002. "2001 Catfish Database." Department of Agricultural Economics Information Report 2002 - 004. Mississippi State University.

Mississippi State University Extension Service. 2002. "Aquaculture: Catfish." http://www.msucares.com/aquaculture/catfish/consumer.html.

National Fisheries Institute. 2002. "U.S. Consumption of Seafood." http://www.nfi.org/news/topten.php

TCI - The Catfish Institute. Various annual reports. Indianola, MS.

Tucker, C.S., and E.H. Robinson. 1991. *Channel Catfish Farming Handbook*. New York: Van Nostrand Reinholt.

U.S. Department of Agriculture, Economic Research Service. 2002. "Aquaculture Outlook." LDP-AQS-15.

U.S. Department of Agriculture, National Agricultural Statistics Service (NASS). 2002. "Catfish Production."

U.S. Department of Agriculture, National Agricultural Statistics Service (NASS). Various months. "Catfish Processing."

U.S. Department of Commerce, National Oceanic Atmospheric Administration, National Marine Fishery Service. 2002. "Fisheries of the U.S., 2001." Current Fishery Statistics No. 2001. Silver Springs, MD. (http://www.st.nmfs.gov/commercial/index.html).

The World Almanac and Book of Facts, 1999. Mahwah, NJ: World Almanac Books.

Appendix I
Survey Instrument

2001 SURVEY OF U.S. FISH AND SEAFOOD CONSUMPTION

Conducted by

Dr. House and Dr. Hanson, Mississippi State University, Department of Agricultural Economics

and

Dr. Sureshwaran, South Carolina State University, Department of Agribusiness and Economics

NOTICE: Any information reported below is strictly confidential. This data will be used only by persons engaged in this survey, and will not be disclosed or released to others for any purpose.

This research is supported by grants from the USDA Higher Education and Mississippi-Alabama Sea Grant Programs and the survey was reviewed by Mississippi State University's Institutional Review Board of the Regulatory Compliance Office, docket number 99-297.

Directions: Please have the member of the household that usually decides what food you purchase fill out this survey. Refer to following definitions to aid you when in doubt if the item is shellfish or finfish. Thank you in advance for taking the time to fill out this survey.

Definitions:

Shellfish: an aquatic animal with a shell (e.g., oyster, clam, mussel, crab, crawfish, lobster, and shrimp)
Finfish: a true fish as distinguished from a shellfish (e.g., cod, catfish, carp, trout, tilapia, tuna, bass, sole, flounder, haddock, perch, snapper, and salmon)

The following three charts will ask you to estimate the number of times you eat various kinds of meat for dinner, lunch, and breakfast. **AT-HOME** refers to eating food at home, or prepared at home. **AWAY-FROM-HOME** refers to eating food prepared by others (i.e., restaurants). In answering the following questions, refer to your average eating habits over the last three years.

1a. Please indicate how often you eat each of the following products for **BREAKFAST AT-HOME** by placing an **X** in the appropriate box.

	Daily	4-6 times weekly	2-3 times weekly	1 time per week	More than 1 time monthly, but less than weekly	Infrequently (less than once per month)	Never
Catfish							
Tuna							
Other finfish							
Shrimp							
Oysters							
Other shellfish							

1b. Please indicate how often you eat each of the following products for **BREAKFAST AWAY-FROM-HOME** by placing an **X** in the appropriate box.

	Daily	4-6 times weekly	2-3 times weekly	1 time per week	More than 1 time monthly, but less than weekly	Infrequently (less than once per month)	Never
Catfish							
Tuna							
Other finfish							
Shrimp							
Oysters							
Other shellfish							

1c. Please indicate how often you eat each of the following products for **LUNCH AT-HOME** by placing an **X** in the appropriate box.

	Daily	4-6 times weekly	2-3 times weekly	1 time per week	More than 1 time monthly, but less than weekly	Infrequently (less than once per month)	Never
Catfish							
Tuna							
Other finfish							
Shrimp							
Oysters							
Other shellfish							

1d. Please indicate how often you eat each of the following products for **LUNCH AWAY-FROM-HOME** by placing an **X** in the appropriate box.

	Daily	4-6 times weekly	2-3 times weekly	1 time per week	More than 1 time monthly, but less than weekly	Infrequently (less than once per month)	Never
Catfish							
Tuna							
Other finfish							
Shrimp							
Oysters							
Other shellfish							

1e. Please indicate how often you eat each of the following products for **DINNER AT-HOME** by placing an **X** in the appropriate box.

	Daily	4-6 times weekly	2-3 times weekly	1 time per week	More than 1 time monthly, but less than weekly	Infrequently (less than once per month)	Never
Catfish							
Tuna							
Other finfish							
Shrimp							
Oysters							
Other shellfish							

1f. Please indicate how often you eat each of the following products for **DINNER AWAY-FROM-HOME** by placing an **X** in the appropriate box.

	Daily	4-6 times weekly	2-3 times weekly	1 time per week	More than 1 time monthly, but less than weekly	Infrequently (less than once per month)	Never
Catfish							
Tuna							
Other finfish							
Shrimp							
Oysters							
Other shellfish							

2. What percentage of the fish (shellfish or finfish) you consume is from: (For example, if you purchase fish from a restaurant half of the time and from a grocery store the other half of the time, your answer would be 50% Grocery Store or Supermarket and 50% restaurant. All answers should total 100%.)

_____ Grocery Store or Supermarket
_____ Restaurant
_____ Recreational Catch
_____ Fish peddler or roadside vendor
_____ Gourmet Specialty Store
_____ Fish Farm
_____ Fish or Seafood Market
_____ Don't Purchase Fish

3. Are you currently aware of any government safety inspections for fish?
☐ YES ☐ NO

4. Have you ever heard the phrase "HACCP"? ☐ YES ☐ NO
If yes, how does "HACCP" affect your consumption of fish?
☐ Increases ☐ Decreases ☐ No Effect

5. Have you ever consumed farm-raised catfish? ☐ YES ☐ NO
If YES, would you consume it again? ☐ YES ☐ NO
If NO, would you consider consuming farm-raised catfish? ☐ YES ☐ NO

6. Have you ever consumed farm-raised oysters? ☐ YES ☐ NO
If YES, would you consume it again? ☐ YES ☐ NO
If NO, would you consider consuming farm-raised oysters? ☐ YES ☐ NO

7. What product forms (fresh fillets, fresh nuggets, . . . frozen fillets, frozen nuggets, etc.) of catfish do you normally purchase for home consumption? Check all that apply.

☐ **Fresh**
☐ Fillets
☐ Nuggets
☐ Steaks
☐ Strips
☐ Whole (without head)
☐ Other (Write-in)
_____

☐ **Frozen**
☐ Fillets
☐ Nuggets
☐ Steaks
☐ Strips
☐ Whole (without head)
☐ Other (Write-in)
_____

☐ **No home consumption**

8a. In your opinion, which of the following is the **SAFEST** shellfish or finfish product to eat? Please mark one.

☐ Tuna ☐ Shrimp ☐ Pollock ☐ Salmon ☐ Cod
☐ Catfish ☐ Clams ☐ Crabs ☐ Flounder/Sole ☐ Halibut
☐ Oyster ☐ No Opinion

8b. In your opinion, which of the following is the **LEAST SAFE** shellfish or finfish product to eat? Please mark one.

☐ Tuna ☐ Shrimp ☐ Pollock ☐ Salmon ☐ Cod
☐ Catfish ☐ Clams ☐ Crabs ☐ Flounder/Sole ☐ Halibut
☐ Oyster ☐ No Opinion

9. In your opinion, from which growing **REGION** do the **SAFEST** oyster products come from?

☐ Pacific Northwest ☐ Gulf of Mexico ☐ Chesapeake Bay
☐ New England ☐ Southeast Atlantic ☐ Mid-Atlantic
☐ No Opinion

10a. The following statements are descriptions of three possible food inspection and safety programs. Please indicate by placing an **X** in the box whether a program as described would increase, have no effect on, or decrease the amount of fish or shellfish you eat.

Plan	Program Description	Increase	No Effect	Decrease
A	Food companies are legally required to maintain their own food safety program using detailed record keeping procedures.			
B	Food companies are legally required to have government agencies visually inspect along with taste tests. If the plant receives a passing grade, their product is labeled with a uniform product safety seal.			
C	A private, independent third party is hired to monitor the food company and determine if the product is safe for consumption and if the plant is operating under sanitary conditions.			

10b. If only one of the above three plans were used to ensure fish or shellfish safety, which plan would you prefer?

☐ **Plan A** ☐ **Plan B** ☐ **Plan C**

11a. Each of the following treatments can be used to kill bacteria and viruses that may be present in raw oysters. Each treatment works equally well and provides a safer oyster without causing any difference in taste and texture. Please indicate whether Treatments A, B, C, and D would increase, have no effect on, or decrease the amount of oysters you eat.

Plan	Program Description	Increase	No Effect	Decrease
A	A process of flushing bacteria and viruses from the oyster with purified water.			
B	A process of exposing oysters to an indirect energy source.			
C	A process of exposing oysters to a direct light energy.			
D	A process of placing oysters in an extremely high pressure			

11b. If only one of the above four plans were used to ensure oyster safety, which plan would you prefer?

☐ **Plan A** ☐ **Plan B** ☐ **Plan C** ☐ **Plan D**

11c. If you chose one of the above processes for ensuring a safe raw oyster product, how much more than the initial raw oyster price would you be willing to pay for a guaranteed safe raw oyster?

$_____ per individual oyster.

12a. The following is a description of a finfish that can be farm-raised in the United States. After reading the description, please indicate whether or not you would be willing to purchase this product:

Fillets have a firm texture with a mild, slightly nutty flavor. Fillets are guaranteed boneless and lack the fishy odor associated with some fish products. Because the fish is farm-raised, fresh product is available year-round and is raised in a quality-controlled environment with stringent control measures (including taste testing).

12b. **I would purchase this fish:**

☐ **Strongly Agree** ☐ **Agree** ☐ **Neutral** ☐ **Disagree** ☐ **Strongly Disagree** ☐ **No Opinion**

If AGREE or STRONGLY AGREE: For boneless fillets, I would be willing to pay $_____/pound (See below for typical meat and fish prices).

Typical prices for other products are: Ground Beef $1.49/lb; Catfish $3.99/lb; Boneless Chicken Breasts $5.99/lb; Salmon Fillets $7.99/lb; Steak $10.99/lb; Shrimp $9.99/lb

13. For each product, please **rank up to the top three reasons (1,2,3)** you **EAT** the product. If you do not eat the product, leave the column blank.

	Enjoy flavor	Health/nutrition	Tradition/habit	Price	Availability	Farm-raised	Convenience	Product safety	Religion	Variety in diet	Know how to prepare	Aphrodisiac properties
Catfish												
Tuna												
Shrimp												
Oyster												

14. For each product, please **rank up to the top three reasons (1,2,3)** you **DO NOT EAT** more of, or do not eat any of the product.

	Price	Fresh products not available	Custom	Religion	Lack of preparation knowledge	Too time consuming to prepare	Don't like texture	Don't like smell	Don't like taste	Traumatic experience	Concerned about product safety	Allergy	Vegetarian	Health and/or nutrition	Only farm-raised is available
Catfish															
Tuna															
Shrimp															
Oyster															

15. Please indicate how you feel about the following statement for the following products. Circle the number which agrees with your preference using 1 as "Strongly Agree" to 5 being "Strongly Disagree" or Zero (0) as "No Opinion."

I prefer farm-raised to wild harvested **Catfish**: 1 2 3 4 5 0
I prefer farm-raised to wild harvested **Tilapia**: 1 2 3 4 5 0
I prefer farm-raised to wild harvested **Salmon**: 1 2 3 4 5 0
I prefer farm-raised to wild harvested **Oysters**: 1 2 3 4 5 0
I prefer farm-raised to wild harvested **Shrimp**: 1 2 3 4 5 0

16. Which of the following would **INCREASE** your consumption of (place an **X** in all boxes that apply):

	Recipes	Coupons	Company quality guarantees	Nutritional information	Doctor's recommendations (diet program)	Packaging (microwavable/convenience)	Availability of quality products	Information on production process	Company safety guarantee	Government safety inspection	Lower price
Catfish											
Tuna											
Shrimp											
Oyster											

17. Do you reside in a:
- ☐ Large Metropolitan area (City) population greater than 100,000 people
- ☐ City with a population less than 100,000 people
- ☐ Small Town with a population less than 10,000 people
- ☐ Rural Area

18. What is your zip code? _____

19. How close do you currently live to a coastal area? (Check one)
_____ Within 0-10 miles _____ 50-100 miles
_____ 10-50 miles _____ > 100 miles

20. What is the closest you have ever lived (including all prior residences) to a coastal area?
_____ Within 0-10 miles _____ 50-100 miles
_____ 10-50 miles _____ > 100 miles

21. In what year were you born? _____

22. What is your gender? ☐ Male ☐ Female

23. Please indicate the number of members in your household in each age group including yourself.
_____0-10 years _____11-20 years _____21-40 years
_____41-60 years _____ 61 years or above

24. What is the highest level of education you have achieved?
☐ Less than High School
☐ High school diploma or GED
☐ Some college
☐ Completed 2-year college degree
☐ Completed 4-year degree (B.A. or B.S.)
☐ Education beyond B.A. or B.S.

25. What is your current level of household income?
☐ Less than $9,999 ☐ $10,000-19,999 ☐ $20,000-29,999
☐ $30,000-39,999 ☐ $40,000-49,999 ☐ $50,000-59,999
☐ $60,000-74,999 ☐ $75,000-99,999 ☐ $100,000-124,999
☐ $125,000 and above

26. Please indicate your religious affiliation.
☐ Catholic ☐ Jewish ☐ Muslim ☐ Buddhist
☐ Christian (Not Catholic) ☐ Hindu
Other _____

27. Which of the following groups represents your ethnic background?
☐ Black/African American ☐ Caucasian
☐ Native American ☐ Asian or Pacific Islander
☐ Hispanic ☐ Other

We would like to thank you for your time in completing this survey. Please return the survey in the enclosed postage paid envelope. If you have any questions about the survey, please contact us at (662) 325-7988.

Mississippi State University
125 YEARS
1878—2003

Printed on Recycled Paper

MSUcares.com

17526