

## Final Report

### An Assessment of Ethnic Market Opportunities for Indiana Farm-Raised Fish

#### Submitted by

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To

The Indiana Soybean Alliance



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## **INTRODUCTION**

The US imports about 83% of the seafood consumed, which are mainly processed seafood. Indiana's aquaculture industry is small and cannot compete with low-priced imported processed seafood products. The Indiana aquaculture industry accounts for only 0.3% of the \$1.1 billion US aquaculture industry. Indiana's potential to increase aquaculture production lies with accessibility to markets as well as niche opportunities. Indiana has the comparative advantage to produce fish that can be sold live and fresh to ethnic markets. Such products can attract premiums. Ultimately, developing the ethnic market would require increased Indiana fish production and the consequent increased use of soy-based fish feed. Opportunities therefore exist to explore and develop the market for live and fresh fish. This market however, is not mainstream but limited to ethnic groups.

The overall objective of this study was to examine the ethnic market in the region, particularly in Indiana to assess seafood buying patterns and preferences. Ethnic markets are traditional outlets for the sale of live and fresh fish that caters for Asian, African and Latin American fish consumers. The populations of these ethnic groups are increasing rapidly in Indiana and yet ethnic retail outlets that cater to this clientele have not been studied. Little is known about their seafood purchasing patterns, habits and preferences. Most Asian grocers carry live fish, and customers who demand live fish products are willing to pay a premium. As part of the growth strategy for Indiana aquaculture, there was the need to study these ethnic markets to assess fish species demanded, supply requirements, demand, prices, product promotion strategies, and other marketing factors. The findings reported from the study are useful in identifying the species that can be produced in Indiana to serve the live market, quantifying potential demand volume, and assessing demand trends and factors affecting demand.

The specific objectives of the study were to:

1. examine wholesale seafood purchase practices of ethnic fish retailers
2. determine factors important to their seafood purchase
3. identify marketing opportunities and develop marketing strategies that will enable effective servicing of ethnic fish markets
4. evaluate customer perceptions, preferences, and purchase patterns for fish

## **STUDY DESIGN AND METHODS**

Two Purdue University undergraduate students were recruited to conduct the survey of both managers and customers of ethnic markets. The stores visited were selected from city yellow page books, internet searches, and industry contacts. The initial focus was on Indiana, and the search yielded 46 Indiana stores. Each of these stores was then contacted by phone to enquire if they

sold live fish. Many responded in the negative, therefore the study area was expanded to the neighboring states of Illinois, Kentucky and Ohio. The expanded search yielded over 300 stores. After a few phone calls, it became clear that few stores sold live fish and these were located primarily in ethnic communities in the cities. Twenty eight (28) stores that sold live fish were visited and 16 managers were willing to participate in the survey. The stores visited were located in these cities - **Indiana:** Indianapolis, West Lafayette, Fort Wayne, and Evansville; **Ohio:** Columbus, Fairfield, Cincinnati, and Cleveland; **Illinois:** Chicago.

The surveys were in-person and conducted by the two Purdue University undergraduate students, one of which is of Chinese origin. The presence of a Chinese enumerator assisted to address cultural, communication and some personal interaction challenges. The surveys were conducted from June-August, and also in October 2008. In the course of surveying the managers, customers were also surveyed. A total of 16 store managers and 461 customers were interviewed during the period. The questionnaires are provided in Appendix 1 – Manager Questionnaire and Appendix II – Customer Questionnaire.

## **RESULTS**

### **General Observations:**

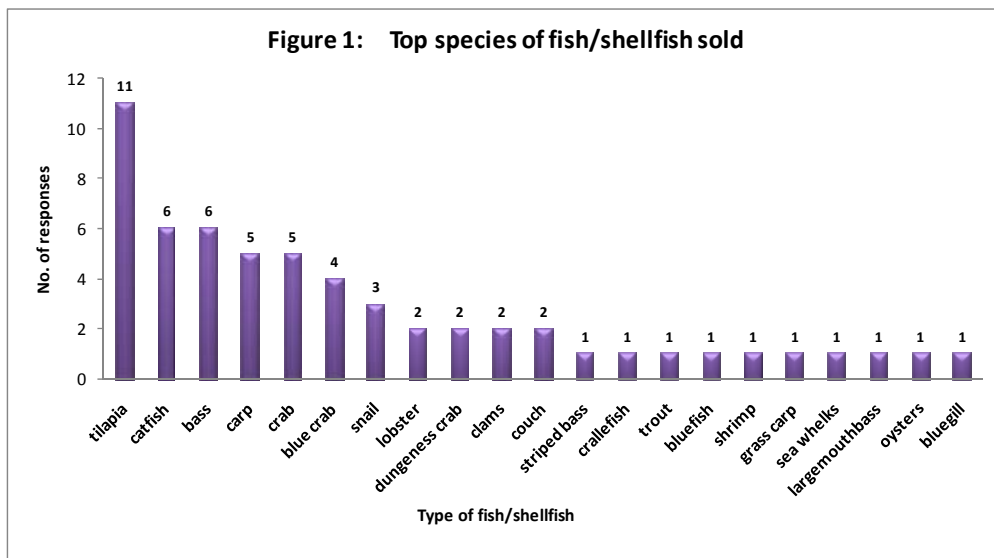
Many things became evident during this 4-month period of talking to fish buyers and sellers. First, the live fish market is strong. Most of the customers purchasing live fish come from a broad spectrum of economic background. Second, it appears culture plays an important role in the live fish market. Customers come from diverse backgrounds, but majority of the customers are Asians. Some customers appear to have been raised with purchasing live seafood, especially customers from south Asia, while others appear to have traditional habits associated with purchasing live seafood. It seemed that, consumers consider habits and traditions first before price when purchasing live fish and some are willing to pay premiums for live fish. Third, most Asian customers appear to make all their grocery purchases in the ethnic stores, which could be related to the culture and language. In some areas such as Chicago's China town, almost all Asian customers used their native language to communicate with shop assistants. Rarely could one find anyone communicating in English in those locations.

Finally, the market for live fish appears to be very competitive particularly in Chicago, as many managers were unwilling to share much information about their activities. Overall, a large number of fish species were observed in stores but the selection varied among the stores. Low valued fish species are common in store locations that service Southeast Asian clientele. Stores that services ethnic groups from the far-East had a range of low to high value fish species. Some stores that did

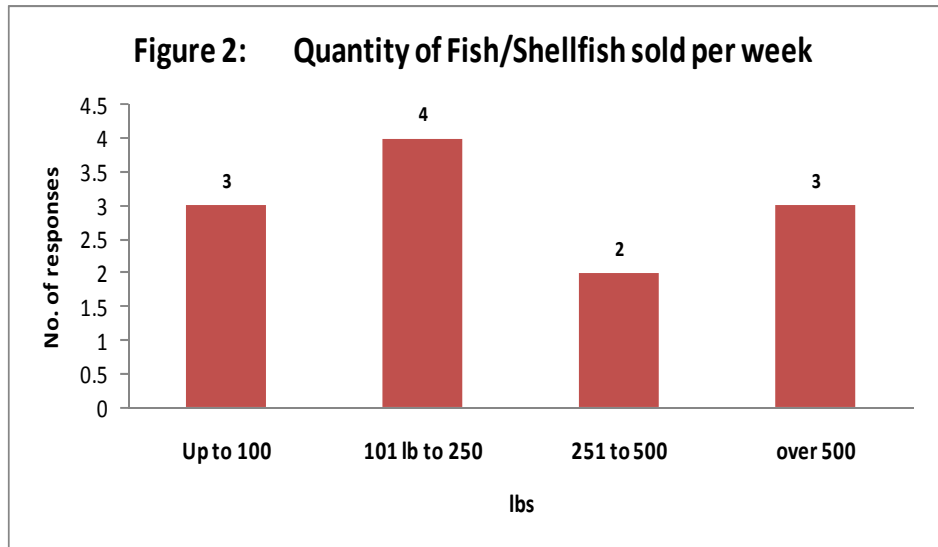
not handle live fish sold dressed-out fish, mainly from the wild or farmed fish processed in store. Some of these managers expressed willingness to purchase fresh-on-ice fish.

**Managers' Results:**

The raw data of responses to the manager survey is presented in Appendix III. Ninety-four (94%) percent of the managers surveyed indicated their store was not part of a chain, implying that they were all independent store units. However, we found a store manager who also owned stores in Cleveland, Columbus and Cincinnati, Ohio. A few managers in Chicago also owned 2 stores in the Chicago area, and serviced different clientele. Most stores were quite new at selling live fish/shellfish as more than half of them had less than 6 years experience. Specifically, 9 managers indicated their store had at most 5 years experience selling live fish/shellfish, 5 managers from 6 – 10 years and only 1 manager had over 10 years experience. Regarding species of fish and shellfish sold, there was a variety of up to 20 fish/shellfish sold by the managers. Figure 1 shows that the top fish/shellfish sold was tilapia followed by catfish and bass. Combined, they accounted for nearly 40% of the top fish/shellfish sold. All the stores visited sold live tilapia. Some managers indicated customers wanted crappie, shrimp and crab, but there is inadequate supply of these species. Managers were asked about fish processing. In response, 8 managers indicated they purchased their fish live and processed in the store while 6 managers indicated they purchased live and sold live without any processing. However, 7 managers indicated both methods of processing fish were used.

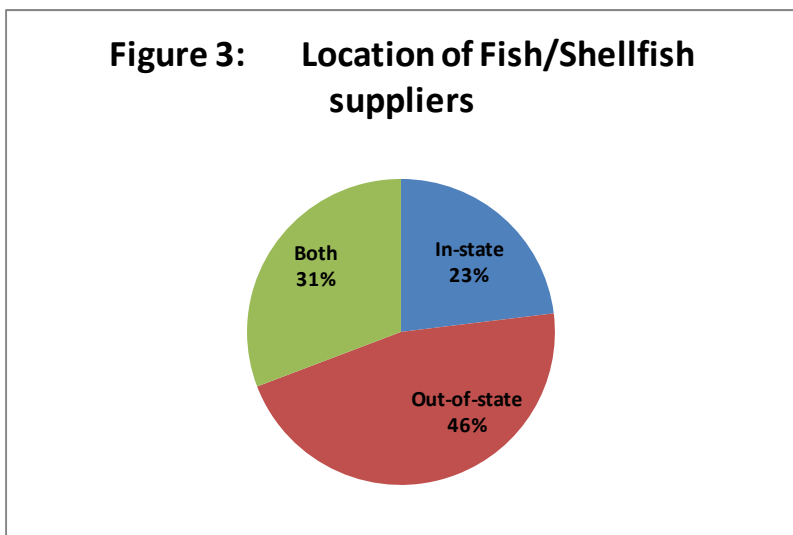


In regards to the amount of fish/shellfish sold weekly, 4 managers indicated that they sold between 101 to 250 lbs of fish/shellfish per week, 3 stores sold up to 100 lbs, another 3 stores sold over 500 lbs, and only 2 sold 251 to 500 lbs per week (Figure 2). Sale of fish appeared to be throughout the



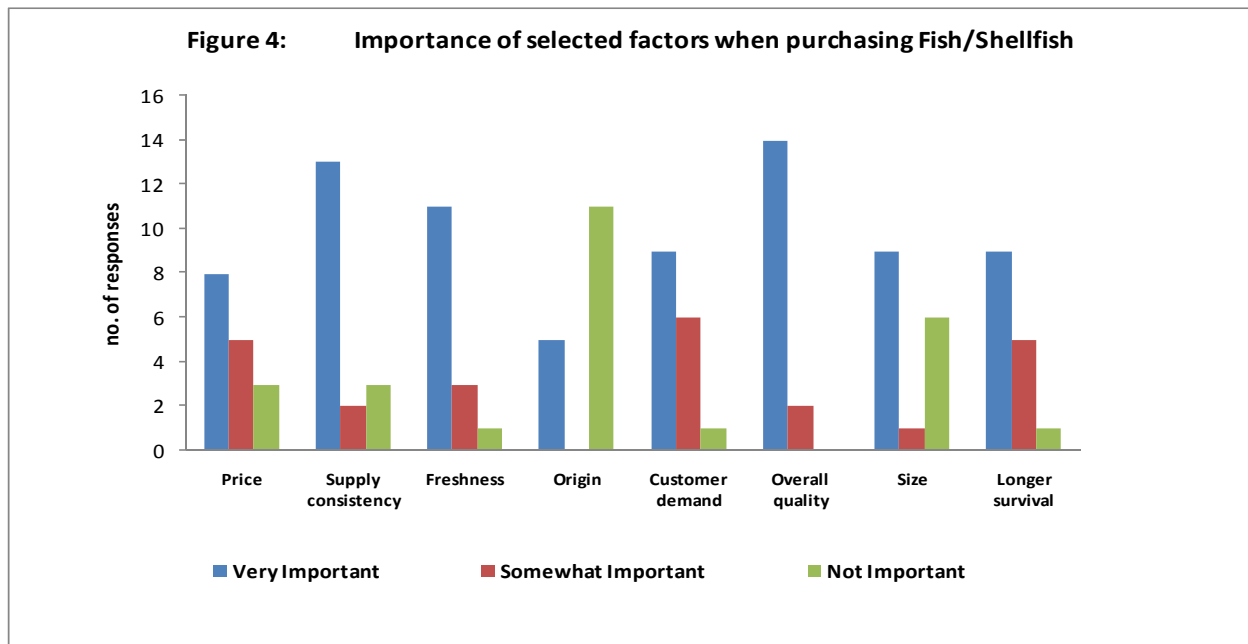
year without any significant differences in fish sales during the different seasons as indicated by the managers. About 29% of managers indicated they sold most live fish in the winter, 26% in the summer, 24% in the fall and 21% of the managers indicated they sold most of the fish in the spring.

The source of fish varied among the stores. Most managers (57%) specified that they had 1 to 2 suppliers of live fish/shellfish, 25% had more than 4 suppliers while 19% had 3 – 4 suppliers. Nearly half (46%) of the managers indicated that the fish/shellfish sold came from out of state (Figure 3). Thirty one percent (31%) of respondents indicated they received fish/shellfish from both in-state and out of state sources, while 23% indicated they obtained fish from only in-state. Managers were then asked how they found their suppliers. Thirty one percent (4 managers) indicated their suppliers were found by word of mouth and the rest by other means. Regarding delivery schedules, 10 managers indicated they received deliveries once every week, 2 managers indicated they received delivery every day, and 1 manager said twice a week, 1 manager said thrice a week, and 1 manager said once a month. It shows that weekly deliveries appear to be the common schedule. As to whether the stores owned hauling trucks to transport live fish, 12 managers

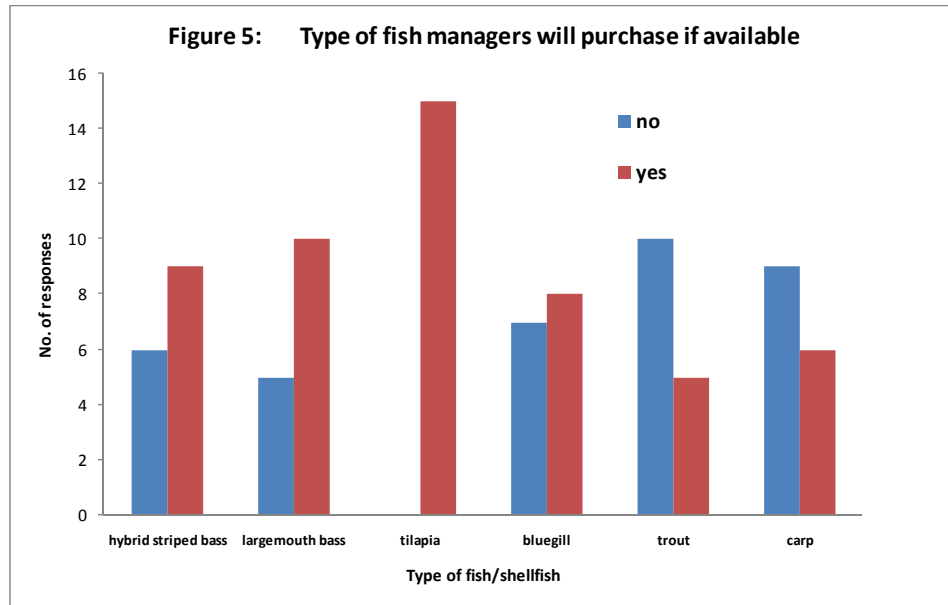


indicated they did not own trucks while 4 indicated they owned trucks and hauled some of their fish from their suppliers.

One major focus of this study was to assess the important factors managers consider when purchasing live fish. The most important factors when purchasing live fish as indicated by managers were overall quality, supply consistency, freshness, size, survival and price (Figure 4). Most managers did not consider origin as important. Managers were asked if they would purchase fish/shellfish from Indiana if assured of quality and availability. To this, all the respondents responded “yes” to tilapia. Many also responded “yes” to largemouth bass and hybrid striped bass. Over half of them responded negatively towards purchasing of trout and carp from Indiana. Regarding the demographic factors of their clientele, most managers indicated that customers who bought live fish/shellfish were Asians, followed by Africans, Hispanic and then Caucasians.



We also examined the relationship between the quantity of fish sold per week and some selected responses. In the summer, 2 stores sold up to 100lbs, 3 stores sold 101 to 250lbs, 1 store sold 251 to 500lbs and 1 store sold over 500lbs. In the winter, 1 store sold up to 100lbs, 3 stores sold 101 to 250lbs, 2 stores sold 251 to 500lbs and 3 stores sold over 500lbs. The stores that sold the most fish were those that purchased live and then sold them live. For example, 3 stores that purchase live fish and sold them live in store sold up to 100lbs, 4 stores sold 101 to 250lbs, 2 stores sold 251 to 500lbs and 2 stores sold over 500 lbs. Those who had the least number of suppliers sold the most fish. According to the data 3 stores with 1-2 suppliers sold up to 100lbs, 3 stores sold 101 to 250lbs and 2 stores sold over 500lbs per week. Most stores received fish once per week.



The most important factors to managers when purchasing live fish were supply consistency and overall quality. The results show that these respondents sold the most fish. For example, one manager who felt that supply consistency was very important when purchasing live fish indicated selling up to 100lbs per week, 4 managers indicated selling 101 to 250lbs per week, 2 managers sold 251 to 500lbs per week and 2 managers sold over 500lbs per week. Two managers who felt that the overall quality was very important sold up to 100lbs per week, 3 managers indicated selling 101 to 250lbs, 2 managers sold 251 to 500lbs and 3 managers sold over 500lbs per week. Interestingly, the managers who indicated that factors such as supply consistency, freshness and longer survival were not important sold less than 251lbs per week. One manager who felt that supply consistency was not important sold up to 100lbs per week. One manager who also felt that freshness was not important sold 101 to 250lbs per week and one manager who indicated that longer survival was not important sold up to 100lbs per week. There is a weak relationship between race and live fish sales.

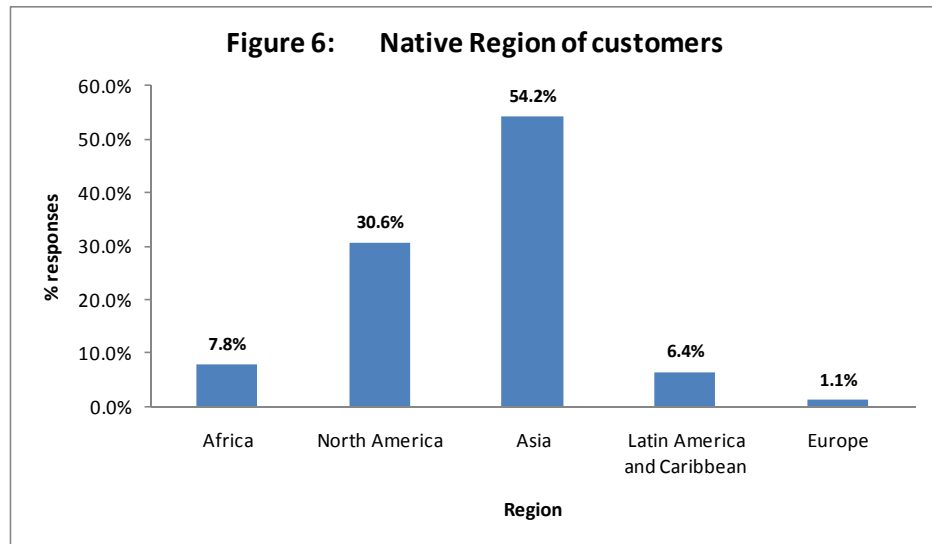
The results show that two managers who indicated Africans as their main customers sold 101 to 250lbs per week, one sold 251 to 500lbs per week and two sold over 500lbs per week. Managers who indicated Hispanic customers as the main clientele also sold up to 100lbs, 1 store sold 101 to 250lbs and 1 store sold over 500lbs. If assured of availability and quality of live fish from Indiana, most of the managers indicated that they would purchase tilapia, hybrid-striped bass and largemouth bass.

## Customers' Results:

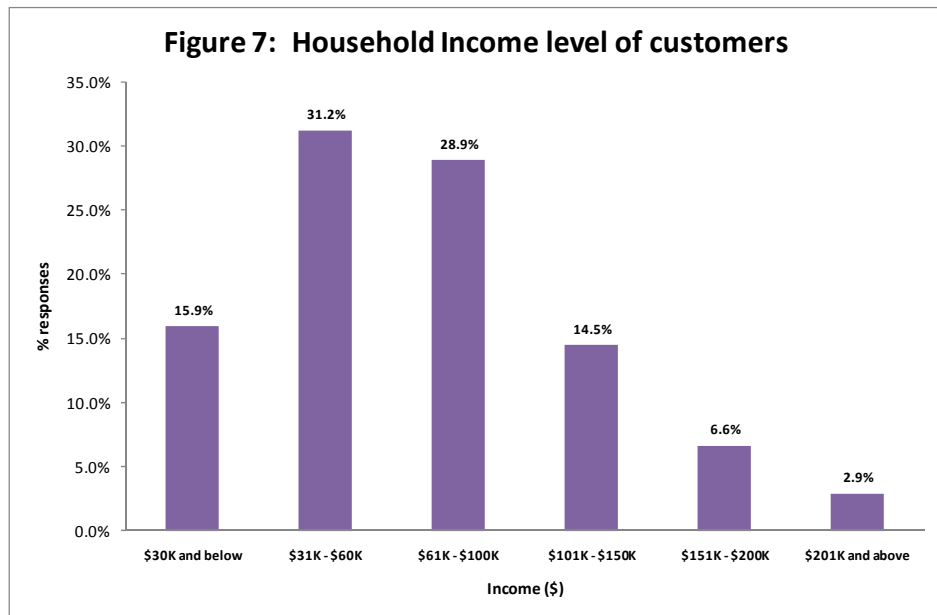
The raw data of responses to the customer survey is presented in Appendix IV. A total of 363 customers who shopped at the ethnic markets were surveyed. Of this number, 44% were females and 46% were males. Forty-six percent (46%) of the respondents are from 36 to 50 years in age, 36% from 21 to 35, 13% from 51 to 65, and 5% over 65. More than half of the customers had a household size of 3 to 5 persons. Thirty-two percent (31%) had up to 2 individuals in their household, 9% had 6 to 8 and less than 1% had more than 8 persons. The data shows that over 80% of the respondents had a level of education above high school. More specifically, 41% had a college education and 41% had a post graduate level of education.

Customers intercepted at the stores came from different countries, i.e., 29 countries on major regions of the world were represented in the survey (Figure 6). Some of the Asian

countries included China, Taiwan, Vietnam, Burma and Philippines. Majority (54%) of the respondents were from Asia, 31% were from North America, 8% were from Africa, 6% were from Latin America/Caribbean and 1% was from Europe. The

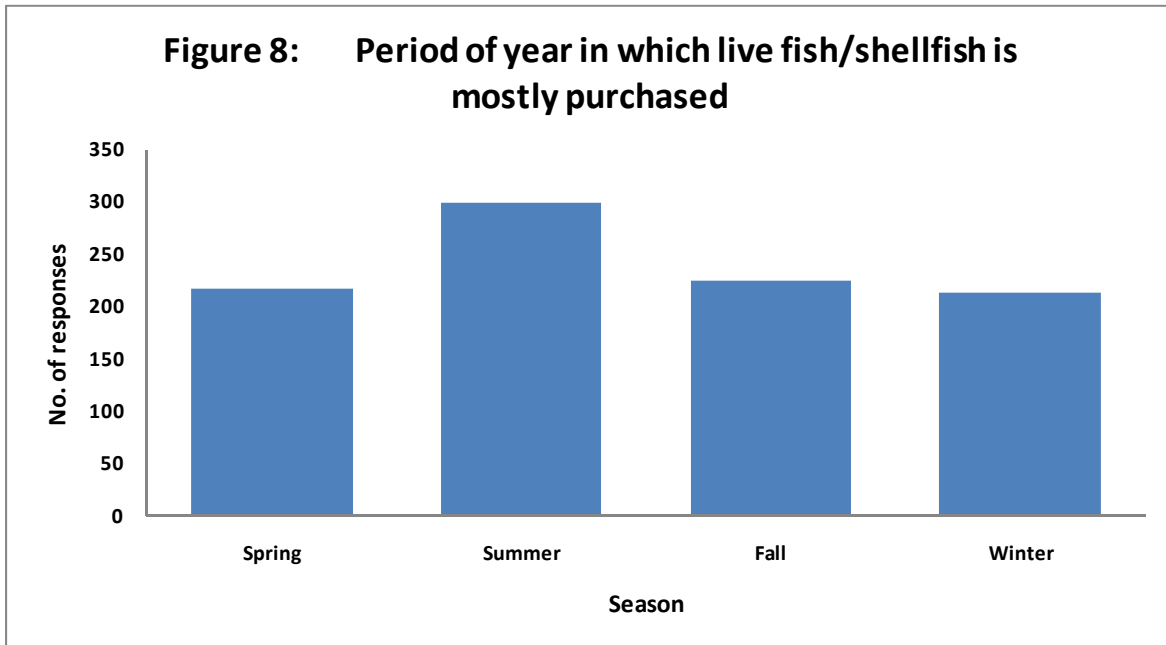


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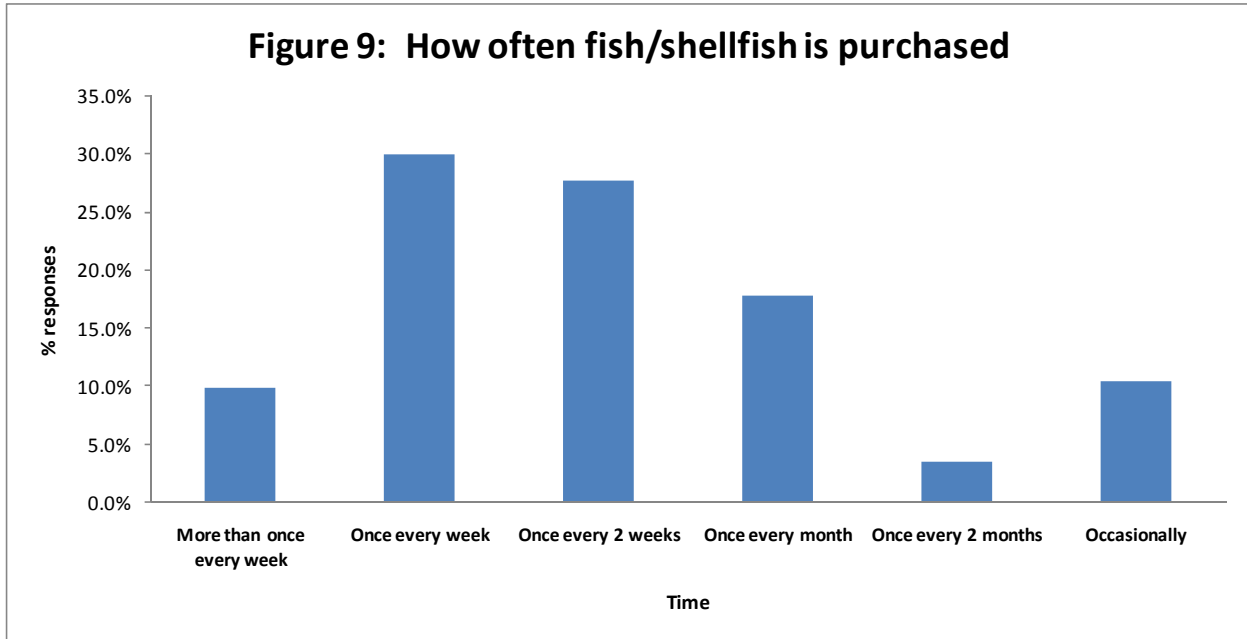
household income range of most respondents was \$31,000-\$60,000 per annum (Figure 7). A good proportion of customers also made between 61,000-100,000 dollars. Very few people made more than \$150,000.



Most customers purchase freshwater fish, followed by shellfish and saltwater fish. Asked about the type of fish they purchased, a total of 56 different species of fish were indicated by customers. The most popular species purchased by customers are tilapia, catfish and shrimp, accounting for 16 %, 13 % and 11 % of the fish purchased respectively. Combined, they constitute about 40% of the total fish/shellfish species purchased. The species least purchased include herring, mahi mahi, monkfish, red ear, crappie and crayfish. When asked how they processed their fish, 63% of customers indicated their fish/shellfish is purchased alive and processed in the store while the remaining 37% purchased live fish and processed at home. Regarding when the decision is made to purchase live fish, 60% of the respondents noted that they decided to buy fish before arriving at the store and 40% of them noted that the decision was made while in the store. As to the season of the year that they purchased fish, it appears all year round though summer was indicated by most customers (Figure 8).

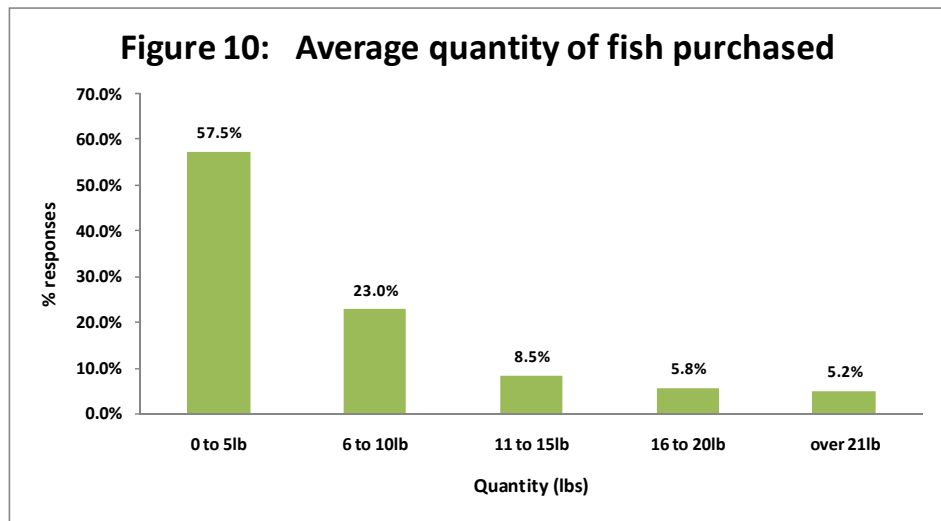
Regarding frequency of fish purchase, 30% of the customers specified that they purchased fish/shellfish once a week and 28% said they purchased fish once every two weeks. About 18% of the respondents purchased fish once per month and 10% purchased fish once every 2 months and occasionally (Figure 9).

**Figure 9: How often fish/shellfish is purchased**

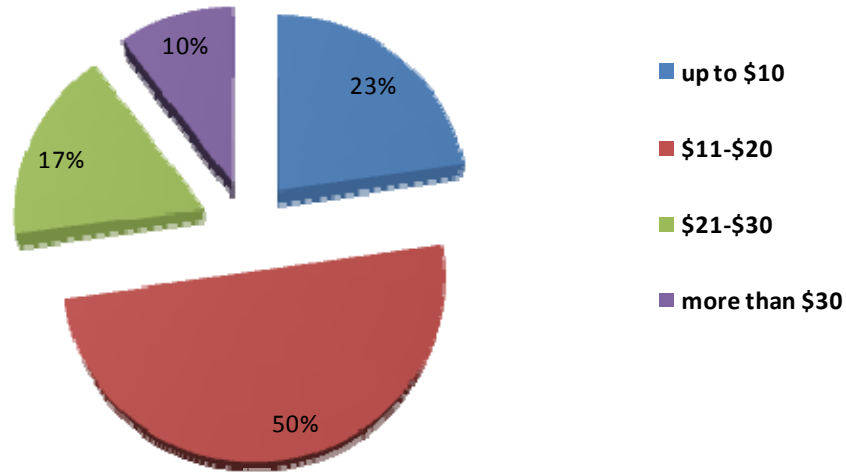


Almost 80 % of the customers buy less than 11 pounds of fish per visit (Figure 10). About 56 % of the customers buy less than 6 pounds, 23 % buy 6 to 10 pounds, 8 % buy 11 to 15 pounds, 6 % buy 16 to 20 pounds and 5 % buy over 21 pounds of fish per visit. The least amount of fish purchased was half a pound and the most purchased was 100 pounds per visit. The most frequent amount of fish purchased was 5 pounds, which was around 16 % of the quantity purchased. In terms of the value of fish purchase per visit, 23% of the customers indicated that they spent up to \$10 per store visit, while half (50%) of customers noted that they spent an average of \$11 to \$20 per visit. Twenty-seven percent (27%) of the customers spent more than \$20 on fish/shellfish (Figure 11).

**Figure 10: Average quantity of fish purchased**



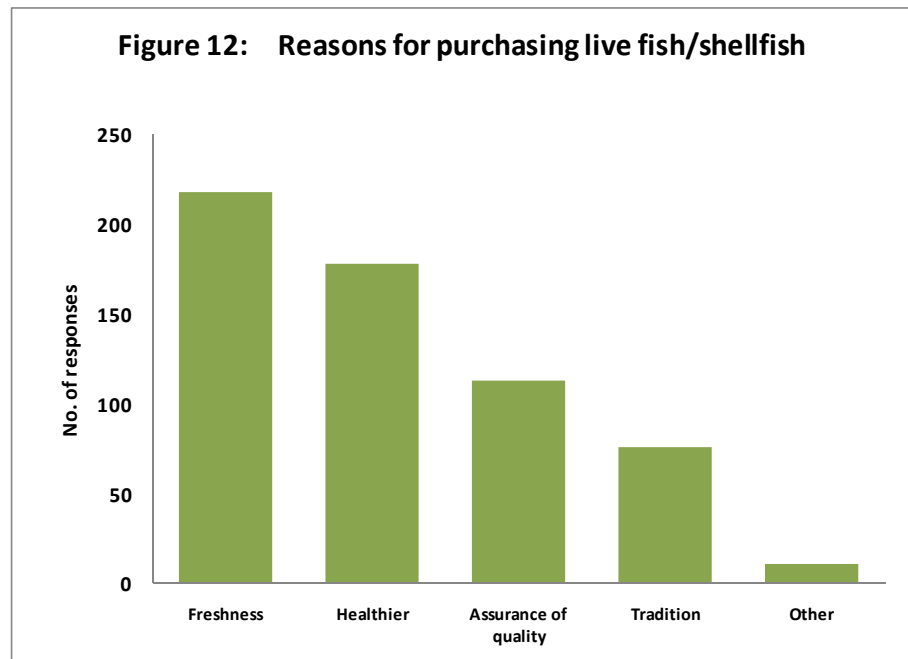
**Figure 11: Average amount of money spent per visit on fish/shellfish**



A number of customers traveled a relatively short distance to purchase live fish/shellfish. Approximately 62 % of customers travelled less than 10 miles. The most frequent number of miles travelled were 5, 10, 15 and 20 which were 13%, 14%, 9% and 12% respectfully.

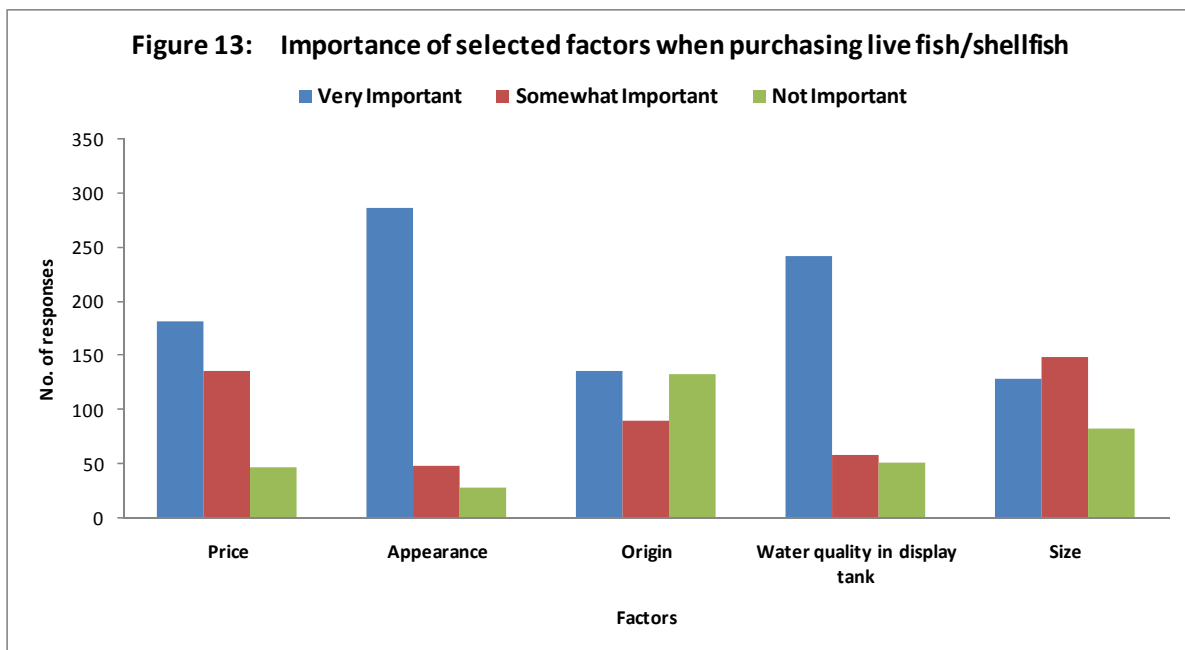
Customers purchased live fish for a number of reasons. Freshness was the major reason indicated by most customers

(Figure 12). A good percentage of customers also buy fish because of health purposes. Very few people purchased fish for traditional reasons. Other reasons that played a part in fish purchase include personal preference, taste and the ease of cooking. Regarding the factors they consider



when purchasing fish, the most important factors appeared to be the appearance of the fish and the water quality in the tank (Figure 13). Almost 80% of the respondents specified that the

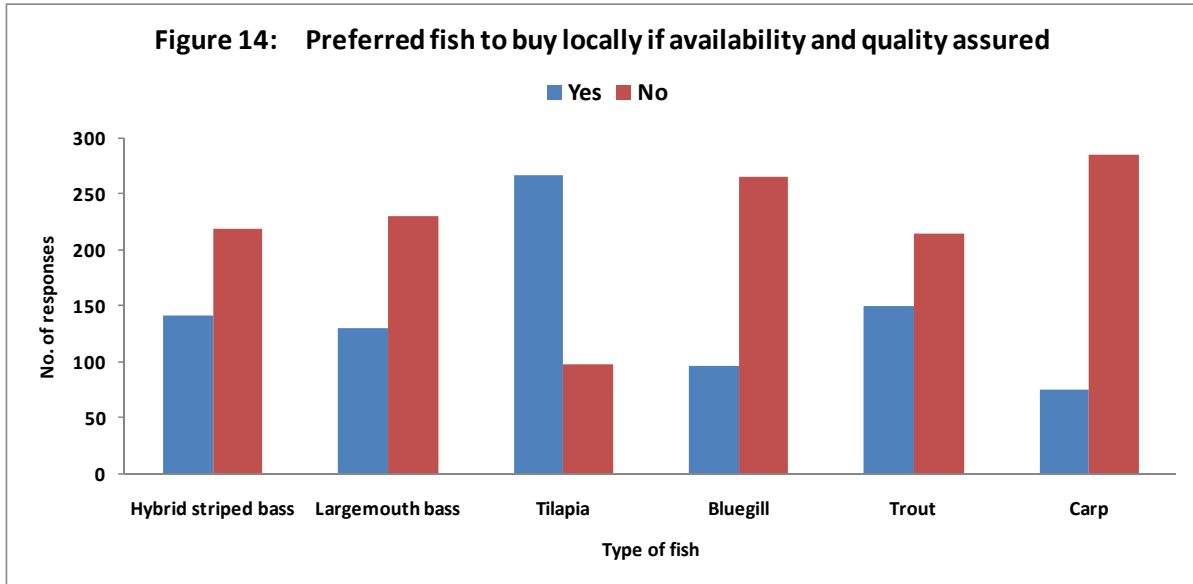
appearance of the fish was very important, and about 70% indicated that the water quality in the display tank was very important. The price and size were also indicated as important and somewhat important. The origin of the fish was the least important factor to the customers. Of importance to this study was to assess how customers will respond to fish grown in Indiana. A large number of respondents indicated that they would buy tilapia from Indiana if quality and availability were assured (Figure 14). Other notable species that would be purchased were hybrid striped bass, trout and largemouth bass. The least preferred fishes appear to be carp and bluegill.



We also examined the relationship between the quantity of fish purchased per week and some selected variables. Most customers purchased 10lbs or less of live fish/shellfish. These customers frequently purchased fish/shellfish weekly or biweekly and spent less than \$21 per visit. They also travelled less than 20 miles to purchase fish. There were some customers though who spent up to \$30 per visit. Most of the respondents decided to buy fish before arriving at the store. However, most customers who purchased up to 2lbs per visit tend to decide to purchase fish while in the store. There was no noticeable relationship between the amount of fish purchased or money spent per visit, and the preferred Indiana fish customers will buy if availability and quality were assured.

The customers who purchased 10lbs of fish/shellfish or less mostly had an income level of less than \$100,000. Despite the quantity of fish purchased, data showed that customers generally bought fish mostly in the summer. However, the data shows that customers who purchased 5lbs or less of fish per month generally purchased fish in the summer. Those who purchased fish in the fall mostly purchased less than 10lbs. Overall, customers placed a low value on the assurance of

quality as a reason for purchasing fish. Those who purchased more than 10lbs (12-48lbs) of fish and those who spent \$11-20, appeared to place a high value on health as a reason for purchasing. Regardless of the amount purchased, freshness was an important reason. Despite the quantity and frequency of fish/shellfish purchased, price, appearance and water quality were important. Customers who felt that the aforementioned factors were important, tend to purchase and process their live fish/shellfish in the store. These same customers mostly purchased fish once per week and once every 2 weeks.



APPENDIX – I (MANAGER QUESTIONNAIRE)

To be answered by the Manager or Person-in-charge of the Store

Purdue University is conducting a study on live fish markets and we will appreciate your participation in this study. The purpose of this study is to find out the live fish needs of ethnic markets and whether the Indiana Aquaculture Industry can help service this market.

This interview is voluntary and you can decide not to participate or decide to stop at anytime during this interview. Your responses to the questions will be kept confidential and aggregated with others to interpret the results. The results will not in any way identify you or this particular store.

Store Name: \_\_\_\_\_ City: \_\_\_\_\_

- 1. Is this store part of a chain? Yes No
2. Do you sell live Fish/Shellfish?
a. Yes (Skip rest of Question 1 and continue with Question 2)
b. No (Complete rest of Question 1 and terminate)
WHY?
Have never sold before. If so, do you plan on selling live Fish/Shellfish in future? Yes No

- Used to sell but stopped. REASONS? (check all that apply)
i. Price is too high
ii. Inconsistent supply
iii. Lack of freshness
iv. Lack of customer demand
v. Poor overall quality
vi. Fish die too soon
vii. Fish size are too small

- 3. What is the composition of the following live Fish/Shellfish products that you sell? (Should add to 100%)
a. Freshwater finfish
b. Saltwater finfish
c. Shellfish
d. Other (Please Specify)

4. How many years have you been selling live Fish/Shellfish? \_\_\_\_\_ years

- 5. List the top 6 species of live Fish/Shellfish that you sell.
a. b. c.
d. e. f.

6. List 3 species of live Fish/Shellfish that customers want but is not available.
\_\_\_\_\_

- 7. How is your live Fish/Shellfish processed?
[ ] Purchased live and processed in store [ ] Purchased live and sold live

8. What quantity of live Fish/Shellfish do you **sell per week**?  
 Up to 100lb     101lb to 250lb     251lb to 500lb     Over 500lb
9. What period of the year do you sell live fish the most?  
 Spring                       Summer                       Fall                       Winter
10. How many suppliers of live Fish/Shellfish do you have?  
 1-2                       3-4                       more than 4
11. Do you own a hauling truck for transporting live Fish/Shellfish yourself?    \_\_\_ Yes    \_\_\_ No
12. Where do your suppliers of live Fish/Shellfish come from?  
 In-state             Out-of-state             Both             Other \_\_\_\_\_
13. How often do you receive live Fish/Shellfish (**delivery schedule**)?  
 \_\_\_\_\_ X every week            \_\_\_\_\_ X every month            \_\_\_\_\_ Occasionally
14. How did you find out about your suppliers of live Fish/Shellfish?  
 Word of mouth             Newspaper                       Grocer Association Directory  
 Website                       Other \_\_\_\_\_
15. How important are these factors to you when purchasing live fish? (check one)

	Very Important	Somewhat Important	Not Important
a. Price			
b. Supply consistency			
c. Freshness			
d. Origin			
e. Customer demand			
f. Overall quality			
g. Size			
h. Longer survival			

16. Who are your main Fish/Shellfish customers?  
 Asian     African     White     Hispanic     Other \_\_\_\_\_
17. If you were assured of availability and quality of the following species from Indiana, which of these live fish would you buy? (check one)

	Yes	No
a. Hybrid Striped Bass		
b. Largemouth Bass		
c. Tilapia		
d. Bluegill		
e. Trout		
f. Carp		

**THANK YOU FOR YOUR TIME AND PARTICIPATION**

**APPENDIX – II (CUSTOMER QUESTIONNAIRE)**

**Consumer Survey (Respondent must be at least 18 years old)**

Purdue University is conducting a study on **live fish** markets and we will appreciate your participation in this study. The purpose of this study is to find out the preferences of shoppers of **live fish**.

This interview is voluntary and you can decide not to participate or decide to stop at anytime during this interview. Your responses to the questions will be kept confidential and aggregated with others to interpret the results. The results will not in any way identify your individual response.

1. Do you buy live Fish/Shellfish?
  - a. \_\_\_\_\_ Yes (Proceed with Question 2)
  - b. \_\_\_\_\_ No (Terminate)
  
2. Do you purchase any of the following live Fish/Shellfish products?
  - a. Freshwater finfish \_\_\_\_
  - b. Saltwater finfish \_\_\_\_
  - c. Shellfish \_\_\_\_
  - d. Other \_\_\_\_
  
3. List the top 6 species of live Fish/Shellfish that you purchase.
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_
  - e. \_\_\_\_\_
  - f. \_\_\_\_\_
  
4. How is your live Fish/Shellfish processed?
 

Purchased live and processed in store       Purchased live and processed at home
  
5. On average, what quantity of live Fish/Shellfish do you purchase per month? \_\_\_\_\_ lb
  
6. On average, how far do you travel to purchase live Fish/Shellfish? \_\_\_\_\_ miles
  
7. What period of the year do you purchase live fish the most?
 

Spring                       Summer                       Fall                       Winter
  
8. What are the reasons for purchasing live fish (Check all that apply)?
 

Assurance of quality       Healthier                       Freshness                       Tradition

Use most of fish, little/no waste                       Other \_\_\_\_\_
  
9. How important are these factors to you when purchasing live fish? (check only one)

	<b>Very Important</b>	<b>Somewhat Important</b>	<b>Not Important</b>
a) Price			
b) Appearance			
c) Origin			
d) Water quality in display tank			
e) Size			



10. How often do you purchase live Fish/Shellfish?

- More than once every week       Once every week       Once every 2 weeks
- Once every month       Once every 2 month       Occasionally

11. On average, how much do you spend on live Fish/Shellfish per visit?

- Up to \$10       \$11-\$20       \$21-\$30       More than \$30

12. When do you decide to purchase live Fish/Shellfish?

- Before arriving at the store       While in the store

13. If you were assured of availability and quality of the following species from Indiana, which of these live fish would you buy?

	Yes	No
a. Hybrid Striped Bass		
b. Largemouth Bass		
c. Tilapia		
d. Bluegill		
e. Trout		
f. Carp		

14. What is the size of your household? \_\_\_\_\_

15. Gender      \_\_\_\_\_ Male      \_\_\_\_\_ Female

16. What is your native country? \_\_\_\_\_

17. What is your level of education?

- Some High School \_\_\_\_\_
- High School \_\_\_\_\_
- College \_\_\_\_\_
- Post graduate \_\_\_\_\_

18. What is your age?

- 20 years or less       21 - 35 years       36 – 50 years
- 51 – 65 years       66 year and above

19. What is your total household income?

- \$30,000 and below       \$31,000 - \$60,000       \$61,000 – \$100,000
- \$101,000 – \$150,000       \$151,000 - \$200,000       \$201,000 and above

**THANK YOU FOR YOUR TIME AND PARTICIPATION**

**Appendix III: Responses to Manager Survey (Appendix I)**

**Question 1: Is this store part of a chain? \_\_\_\_\_ Yes \_\_\_\_\_ No**

	no. of responses
yes	1
no	15

**Question 2: Do you sell live fish/shellfish? \_\_\_\_\_ Yes \_\_\_\_\_ No**

	no. of responses
yes	16
no	0

**Question 3: (No Response)**

**Question 4: How many years have you been selling fish/shellfish?**

Years	0-5 yrs	6-10 yrs	11-15 yrs
no. of people	9	5	1

**Question 5: List the top species of live fish/shellfish that you sell.**

Type of fish	No. of fish/shellfish	Percentage
tilapia	11	19.0%
catfish	6	10.3%
bass	6	10.3%
carp	5	8.6%
crab	5	8.6%
blue crab	4	6.9%
snail	3	5.2%
lobster	2	3.4%
dungeness crab	2	3.4%
clams	2	3.4%
couch	2	3.4%
striped bass	1	1.7%
crallefish	1	1.7%
trout	1	1.7%
bluefish	1	1.7%
shrimp	1	1.7%
grass carp	1	1.7%
sea whelks	1	1.7%
largemouthbass	1	1.7%
oysters	1	1.7%
bluegill	1	1.7%
<b>N=16</b>	Total=58	

**Question 6: List 3 species of live fish/shellfish that customers want but are not available.**

Type of fish/shellfish	no. of responses
shrimp	1
crab	1
crappie	2

**Question 7: How is your live fish/shellfish processed?**

How fish is processed	no. of responses
Purchased Live and processed in store	8
Purchased live and sold live	6
Both	7

**Question 8: What quantity of fish do you sell per week?**

Quantity of fish/shellfish sold	no. of responses
up to 100	3
101 lb to 250	4
251 to 500	2
over 500	3

**Question 9: What period of year do you sell live fish the most?**

Period of year fish is sold	no. of responses
Spring	7
Summer	9
Fall	8
Winter	10
N=15	

**Question 10: How many suppliers of fish/shellfish do you have?**

No. of suppliers	no. of responses
1 to 2	9
3 to 4	3
more than 4	4

**Question 11: Do you own a hauling truck for transporting live fish/shellfish yourself?**

Yes	4
no	12

**Question 12: Where do your suppliers of live fish/shellfish come from?**

In-state	3
Out-of-state	6
Both	4

Question 13: How often do you receive live fish/shellfish?

Time	No. of responses
Every day	2
3 times/wk	1
2 times/wk	1
Once/wk	10
Once/month	1
Occasionally	1

Question 14: How did you find out about your suppliers of live fish/shellfish?

Method	No. of responses
Word of mouth	4
Other	9
<b>N=10</b>	

Question 15: Importance of selected factors when purchasing live fish/shellfish?

	Very Important	Somewhat Important	Not Important	N=
Price	8	5	3	16
Supply consistency	13	2	3	16
Freshness	11	3	1	15
Origin	5	0	11	16
Customer demand	9	6	1	16
Overall quality	14	2	0	16
Size	9	1	6	16
Longer survival	9	5	1	15

Question 16: Who are your main fish/shellfish customers?

Race	No. of responses
Asian	16
African	5
White	1
Hispanic	3
<b>N=16</b>	

Question 17: Type of fish managers will purchase if available.

Type of fish/shellfish	no	yes
hybrid striped bass	6	9
largemouth bass	5	10
tilapia	0	15
bluegill	7	8
trout	10	5
carp	9	6
<b>N=15</b>		

**Appendix IV: Responses to Customer Survey (Appendix II)**

**Question 1: Do you buy live fish/shellfish?**

People who bought fish	no. of responses
Yes	365
No	0
<b>No. of customers = 365</b>	

**Question 2: Do you purchase any of the following live fish/shellfish products?**

	Yes	No	no. of responses
Freshwater	300	62	362
Saltwater	137	227	364
Shellfish	172	191	363
<b>N= 365</b>			

**Question 3: List the top 6 species of live fish/shellfish that you purchase.**

Type of fish	Percent	Responses
Tilapia	16.4%	176
Catfish	13.2%	142
Shrimp	10.7%	115
Salmon	8.7%	94
Crab	6.8%	73
Bass	5.9%	64
Perch	3.9%	42
Carp	2.9%	31
Whiting fish	2.9%	31
Trout	2.4%	26
Lobster	2.2%	24
Tuna	2.2%	24
Mackerel	2.0%	21
Snapper	1.9%	20
Oyster	1.6%	17
Bluegill	1.5%	16
Clam	1.4%	15
Cod	1.1%	12
Buffalo	1.0%	11
Mussel	1.0%	11
Walleye	0.9%	10
Croaker	0.8%	9
King fish	0.8%	9
Flounder	0.7%	8
Belt fish	0.7%	7
Milk fish	0.7%	7

Pomfret	0.5%	5
Grouper	0.4%	4
Halibut	0.4%	4
Sardine	0.4%	4
Scallops	0.4%	4
Sword fish	0.4%	4
Asian	0.3%	3
Eel	0.3%	3
Blue fish	0.2%	2
Butter fish	0.2%	2
Octopus	0.2%	2
Orange roughy	0.2%	2
Snail	0.2%	2
Squid	0.2%	2
Sunfish	0.2%	2
Yellow fish	0.2%	2
Camaron	0.1%	1
Crayfish	0.1%	1
Crappie	0.1%	1
Gorden	0.1%	1
Herring	0.1%	1
Hokke	0.1%	1
Mahi mahi	0.1%	1
Monk fish	0.1%	1
Puppy drum	0.1%	1
Red ear	0.1%	1
Sea cucumber	0.1%	1
Shark	0.1%	1
Skates	0.1%	1
Spot	0.1%	1
<b>N = 364</b>		

**Question 4: How is your live fish/shellfish processed?**

How fish is processed	No. of responses
Purchased Live and processed in store	226
Purchased live and processed at home	134
<b>N=360</b>	

**Question 5: What quantity of fish/shellfish do you purchase per month?**

Average quantity of fish purchased	Percentage	no. of responses
0 to 5	57.5%	210

6 to 10	23.0%	84
11 to 15	8.5%	31
16 to 20	5.8%	21
over 21	5.2%	19
<b>N= 365</b>		

**Question 6: How far do you travel to purchase live fish/shellfish?**

Distance travelled to purchase fish	Percentage	no. of responses
0 to 5	37.3%	136
6 to 10	24.9%	91
11 to 15	12.3%	45
16 to 20	12.3%	45
21 to 25	1.4%	5
26 to 30	4.1%	15
31 to 35	0.5%	2
over 36	7.1%	26
<b>N= 365</b>		

**Question 7: What period of the year do you purchase live fish the most?**

Season	Yes	no. of responses
Spring	216	359
Summer	298	362
Fall	225	361
Winter	213	360

**Question 8: What are the reasons for purchasing live fish?**

Reasons	Yes	No. of responses
Freshness	218	363
Healthier	178	359
Assurance of quality	113	359
Tradition	76	358
Other	11	358

**Question 9: The importance of selected factors when purchasing live fish/shellfish.**

Factors	Very Important	Somewhat Important	Not Important	N=
Price	181	135	46	362
Appearance	287	48	27	362
Origin	136	90	132	358
Water quality in display tank	242	58	51	351
Size	128	149	82	359

**Question 10: How often do you purchase live fish/shellfish?**

Time	Percentage	No. of responses
More than once every week	9.9%	36
Once every week	29.9%	109
Once every 2 weeks	27.7%	101
Once every month	17.8%	65
Once every 2 months	3.6%	13
Occasionally	10.4%	38
<b>N=365</b>		

**Question 11: How much do you spend on live fish/shellfish per visit?**

Money spent on live fish/shellfish per visit	Percentage	No. of responses
up to \$10	22.6%	82
\$11-\$20	50.1%	182
\$21-\$30	17.1%	62
more than \$30	10.2%	37
<b>N=363</b>		

**Question 12: When do you decide to purchase live fish/shellfish?**

Timing of decision to buy fish	No. of responses
Before arriving at the store	213
While in the store	141
<b>N= 354</b>	

**Question 13: Preferred fish to buy locally if availability and quality assurance were given.**

Type of fish	Yes	No	No. of responses
Hybrid striped bass	142	219	363
Largemouth bass	131	230	363
Tilapia	267	98	365
Bluegill	97	265	363
Trout	150	214	364
Carp	75	284	359

**Question 14: What is the size of your household?**

No. of people	Percentage	No. of responses
0 to 2	32.1%	117
3 to 5	58.4%	213
6 to 8	8.8%	32
9 to 11	0.3%	1
more than 12	0.5%	2
<b>N=365</b>		



**Question 15: What is your gender?**

Gender	No. of responses
Male	166
Female	197

**Question 16: What is your native country?**

Region	Percentage	No. of responses
Africa	7.8%	28
North America	30.6%	110
Asia	54.2%	195
Latin America and Caribbean	6.4%	23
Europe	1.1%	4
<b>N=360</b>		

**Question 17: What is your level of education?**

Level of education	Percentage	No. of responses
Some high school	3.6%	13
High school	14.0%	50
College	41.6%	149
Post graduate	40.8%	146
<b>N=358</b>		

**Question 18: What is your age?**

Age	No. of responses
20 years or less	3
21-35	127
36-50	165
51-65	47
66 and above	19
<b>N=361</b>	

**Question 19: What is your total household income?**

Household Income	Percentage	No. of responses
30,000 and below	15.9%	55
31,000-60,000	31.2%	108
61,000-100,000	28.9%	100
101,000-150,000	14.5%	50
151,000-200,000	6.6%	23
201,000 and above	2.9%	10
<b>N=346</b>		