

An Analysis of Consumer Perceptions of Fresh Fish and Seafood in the Delmarva Region*

by

Craig R. Kreider

Former Undergraduate Research Assistant
Delaware Agricultural Experiment Station
Dept. of Food and Resource Economics, College of Agricultural Sciences
University of Delaware, Newark, Delaware, 19717-1303

Conrado M. Gempesaw II

Professor
Delaware Agricultural Experiment Station
Dept. of Food and Resource Economics, College of Agricultural Sciences
University of Delaware, Newark, Delaware, 19717-1303

J. Richard Bacon

Research Associate III
Delaware Agricultural Experiment Station
Dept. of Food and Resource Economics, College of Agricultural Sciences
University of Delaware, Newark, Delaware, 19717-1303

Ulrich C. Toensmeyer

Professor
Delaware Agricultural Experiment Station
Dept. of Food and Resource Economics, College of Agricultural Sciences
University of Delaware, Newark, Delaware, 19717-1303

Andrew J. Groff

Former Undergraduate Research Assistant
Delaware Agricultural Experiment Station
Dept. of Food and Resource Economics, College of Agricultural Sciences
University of Delaware, Newark, Delaware, 19717-1303

*The research was funded in part by the Agricultural Marketing Service, USDA, and the Delaware State Department of Agriculture.

Abstract

The results of a consumer study concerning fresh fish and seafood consumption and attitudes in the Delmarva region are presented and discussed. Chi-square testing for independence is used to determine significance of selected demographic variables. Currently, 96.1 percent of consumers studied consume fresh fish and seafood, and per capita consumption of fresh fish and seafood has increased over the past five years. Freshness, a good appearance, flavor, and safety are factors consumers desire in fresh fish and seafood. Taste, odor, and price were the major deterrents to seafood purchases. Consumers desire greater government control and regulation of the seafood industry in the form of seafood inspection and mandatory nutritional labeling.

Key Words

Fresh fish and seafood, Inspection, Nutritional labeling, Consumer attitudes.

Introduction

By 1991, the domestic per capita consumption of seafood products increased nearly 30 percent over 1971 totals (The Food Institute). This growth in the demand for seafood products resulted mostly from increases in population and partially from increases in consumption by the occasional consumer of seafood (The National Fish and Seafood Promotional Council, 1991). Also, increased health awareness has led many consumers to turn to seafood because of the highly publicized health benefits.

Increases in per capita consumption of fresh fish and seafood is second only to the increase in per capita consumption of poultry (+33.5%), and much better than the changes in per capita consumption of beef (-13.6%) and pork (-2.3%) for the same period. The per capita increases in consumption of fresh fish and seafood as well as poultry vis-a-vis the decrease in per capita consumption of beef and pork indicates that many households have altered their consumption habits to reduce fat intake, cholesterol, and weight. These consumers have generally substituted red meat with chicken or fresh fish and seafood.

Experts within the seafood industry are predicting the consumption of seafood to almost double within the next 30 years, resulting in shortages of fish and seafood products (Quick Frozen Foods International, 1991; Rogness and Weddig, 1991; and Dowdell, 1990). Shortages may already be becoming a reality. The erratic supply of seafood (Harvey, 1991) leads to times when demand is greater than supply, providing incentive to harvest beyond maximum sustainable yields. Evidence exists to support this scenario. Harvests in the North Atlantic have been declining, and in the European Community, up to 75 percent of wild stocks are being harvested beyond sustainable rates (Rogness and Weddig, 1991).

Future growth in the supply of seafood on a worldwide basis is expected to come from commercial production of fish products (National Marine Fisheries Service, 1990; National Oceanic and Atmospheric Administration, 1990). Aquaculture is a rapidly growing industry in the United States with major success stories being the catfish industry, based in the Mississippi Delta, and the trout industry, based in Idaho, North Carolina, California, and Pennsylvania. By the year 2000, the U.S. aquaculture industry is expected to produce 1.26 billion pounds annually (Institute of Medicine, 1991).

Commercial aquaculture provides potential for farmers to diversify, increase farm income, and use idle resources. Public support stems from the realization that this fast growing segment of the agricultural sector might spark needed economic development in rural areas as well as adding the indirect benefit of increased availability of aquaculture products (Mellor, 1980).

Obstacles which may stand in the way of this growth are the concern over seafood safety and rising retail seafood prices due to the erratic supply. In fact, despite the overall growth in seafood consumption over the past two decades, the per capita consumption of seafood in the United States has fallen by 2 percent annually since 1987 (Putnam and Allshouse, 1992). Safety concerns and rising prices are held accountable for this downturn (Harvey, 1991).

Aquaculture could help to overcome these obstacles. Increased supplies of aquaculture-produced fish and seafood would serve to stabilize prices. Furthermore, the aquaculture environment is far more controlled than open-access waters, thus reducing the chances of poisoning or contamination. However, the latter point may not be recognized by consumers.

This study evaluates consumer purchasing habits and purchasing determinants for fresh fish and seafood, and determines consumer attitudes and opinions about selected issues concerning fresh fish and seafood. Also, demographic variables are studied to determine what effects they might have on purchasing habits, purchasing determinants, and consumer attitudes and opinions about fresh fish and seafood.

Procedure and Demographic Overview

The data were collected from a consumer study conducted in 1991 concerning fresh fish and seafood consumption and attitudes in the Delmarva region (a region comprising the state of Delaware, the three counties on the eastern shore of Maryland, and two counties of Virginia). A random mailing sample of 10,000 telephone subscribers, based on zip code population and including unlisted households, was obtained from Targeting Market Service, a division of TRW. There were 1463 usable questionnaires returned for a response rate of 14.6 percent.

Consumers were asked a series of referendum, contingent valuation, and free response questions regarding their attitudes about fresh fish and seafood. The contingent valuation questions required respondents to rate various issues on a scale of 1-7, where 1 and 7 represent opposite ends of a spectrum of possible responses.

The largest portion of respondents, 35.9 percent, were in the 35-49 years age group, while slightly more than one-half (52.6%) of the respondents were men (Table 1). Approximately three-quarters of the respondents graduated from high school, and one-half of high school graduates went on to obtain a bachelor degree. Just over 13 percent of all respondents have done some graduate study, while just under 9 percent did not com-

plete high school. Nearly 60 percent of all respondents earned between \$20,000 and \$60,000 annually, with the largest concentration, 18.4 percent, in the \$30,000 - \$39,999 income range.

Table 1
Demographic Characteristics of Respondents
To Seafood Consumption Survey,
Delmarva 1991

<u>Characteristic</u>	<u>N</u>	<u>Percent</u>
<u>AGE</u>		
18-34 years of age	310	21.6
35-49	529	37.1
50-64	319	22.3
65 or older	272	19.0
Did not answer	<u>37</u>	<u>N/A</u>
TOTAL	1463	100.0
<u>SEX</u>		
Male	752	52.6
Female	677	47.4
Did not answer	<u>34</u>	<u>N/A</u>
TOTAL	1463	100.0
<u>EDUCATION</u>		
Less than high school	127	8.7
High school graduate	547	37.4
Some college	241	16.5
Bachelor degree	353	24.1
Some graduate work or degree	<u>195</u>	<u>13.3</u>
TOTAL	1463	100.0
<u>ANNUAL HOUSEHOLD INCOME</u>		
< \$10,000	63	4.7
\$10,000-19,999	112	8.4
\$20,000-29,999	190	14.2
\$30,000-39,999	247	18.4
\$40,000-49,999	183	13.7
\$50,000-59,999	178	13.3
\$60,000-69,999	114	8.5
\$70,000-79,999	72	5.4
\$80,000 or higher	180	13.4
Did not answer	<u>124</u>	<u>N/A</u>
TOTAL	1463	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

Basic descriptive survey results presented include topics such as consumer's at-home and restaurant seafood consumption, product type and size, familiarity with selected seafood products, reasons for eating more or fewer seafood products, and consumer preferences and attitudes. Chi-square testing for independence is also used to determine significant differences among demographic groups' responses to selected variables.

Results

Over 96 percent of respondents reported that they eat fresh fish or seafood (Table 2). For respondents who do not consume fish or seafood, the reason most frequently given was taste (42.3%), followed by odor and price, at 28.8 and 26.9 percent, respectively (Table 3). Previous research indicates that consumers prefer fish and seafood that is bland, meaning that it does not have a "fishy" taste or odor (Stutzman, 1992).

Table 2
Consumption of Fresh Fish or Seafood,
Delmarva, 1991

Response	N	Percent
Yes	1390	96.1
No	57	3.9
No Response	16	N/A
TOTALS	1463	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

Flounder was the first choice of 21.1 percent of consumers for at-home seafood consumption, while crab and shrimp followed as the first choice of 19.9 and 14.8 percent of consumers, respectively (Table 4). Shrimp was most often ranked as one of the top three choices for at-home seafood consumption, as chosen by 51.3 percent of consumers. Flounder and crab followed closely, ranked by 47.8 and 47.7 percent of consumers; trout, salmon, and tuna followed as the

overall most popular products, chosen by 20.9, 15.8 and 12.3 percent of consumers, respectively.

Table 3
Consumer Reasons for Not Eating Fresh Fish
And/or Seafood, Delmarva, 1991

Reason	N	Percent
Taste	22	42.3
Odor	15	28.8
Price	14	26.9
Preparation	9	17.3
Diet	9	17.3
Freshness	8	15.4
Healthfulness	7	13.5
Never Eaten	6	11.5
Appearance	5	9.6
Quality	4	7.7
Allergy	2	3.5
Other	8	15.4

Source: Delmarva Consumer Seafood Survey and Calculations

Table 4
Consumer Product Choice Rankings
Of Selected Fresh Fish and Seafood Items
For At Home Consumption, Delmarva, 1991

Product Type	---Product Choice Rankings---		
	First	Second	Third
	----- percent -----		
Flounder	22.1	14.9	10.8
Crab	19.9	13.6	14.2
Shrimp	14.8	19.7	16.8
Trout	9.3	5.9	5.7
Salmon	4.5	5.5	5.8
Tuna	3.8	4.7	3.8
Catfish	2.9	2.7	2.2
Orange Roughy	2.5	2.2	2.5
Perch	2.0	2.2	1.7
Cod	2.0	2.0	2.0
Other	16.2	26.6	33.9

Source: Delmarva Consumer Seafood Survey and Calculations

The one pound product size was most often indicated as the product size consumers preferred for all top five at-home consumption seafood products (Table 5). Over 93 percent of consumers preferred fileted flounder for at-home consumption, while three-quarters of at-home consumers preferred their trout fileted. Almost 20 percent preferred to buy whole trout. Approximately 40 percent of consumers favored steamed/boiled crabs and shrimp, but whole/in-shell also was chosen by 11.8 and 17.4 percent, respectively. Ten percent of respondents preferred crab meat in cake form, and 15 percent favored fresh/live shrimp. Salmon was desired in both filet and steak forms. In general, fish is preferred in filet form, while crustaceans are preferred in the steamed/boiled form.

Table 5
Consumer Desired At-Home
Seafood Product Size and Form,
Delmarva, 1991

Product	-----Size-----		-----Form-----	
	lbs	percent	form	percent
Flounder	1.0	53.9	filet	93.2
	2.0	12.5	whole	1.8
	0.5	8.9	fresh/live	1.1
Crabs	1.0	31.4	steamed/boiled	40.4
	1 doz	15.3	whole/in shell	11.8
	1 bu	11.5	cake	10.0
Shrimp	1.0	39.7	steamed/boiled	40.4
	2.0	14.8	whole/in shell	17.4
	5.0	7.5	fresh/live	15.0
Trout	1.0	38.9	filet	74.6
	2.0	18.5	whole	19.2
	1.5	9.7	fresh/live	1.3
Salmon	1.0	50.3	filet	51.7
	1.5	13.5	steak	42.5
	0.5	11.0	canned	1.7

Source: Delmarva Consumer Seafood Survey and Calculations

Using a 1-7 rating scale where 1 is "increased" and 7 is "decreased," consumers indicated that their consumption of fresh fish and seafood, poultry, and fresh fruits and vegetables has increased during the last five years, with means of 2.6, 2.23, and 2.3, respectively (Table 6). Consumption of dairy products, beef, and pork has been about the same to slightly less with means of 4.12, 4.72 and 4.79, respectively, while consumption of eggs, with a mean of 5.17, has decreased.

Table 6
Consumer Change in Consumption
Of Selected Products
Over the Last Five Years, Delmarva, 1991

Product	Mean ^a	Standard Deviation
Fresh Fish/Seafood	2.60	1.50
Poultry	2.23	1.27
Fresh Fruits and Vegetables	2.30	1.31
Dairy Products	4.17	1.53
Beef	4.72	1.54
Pork	4.79	1.54
Eggs	5.17	1.58

^a 1 = More 7 = Less

Source: Delmarva Consumer Seafood Survey and Calculations

Consumers revealed they believe seafood to be more expensive than poultry with a mean of 2.7, as well as beef and pork, with means of 3.01 and 3.10, respectively (Table 7). Consumers indicated they perceive seafood to be more healthful than beef and pork with means of 2.12 and 2.26, but only slightly more healthful than poultry, with a mean of 3.38. Consumers rated the quality of seafood compared to other food products as the same to slightly better than beef, pork and poultry, with means 3.73, 3.65 and 3.77, respectively. In terms of price, healthfulness, and quality, these results point out that poultry will be more competitive with fish and seafood than beef or pork.

Table 7
Consumer Opinion about Various Traits
of Seafood Products Versus
Traits of Other Selected Food Products,
Delmarva, 1991

Trait	Product		
	Beef	Pork	Poultry
	Means ^a		
Price	3.01	3.10	2.70
Healthfulness	2.12	2.26	3.38
Quality	3.73	3.65	3.77

^a 1 = Seafood Higher 7 = Seafood Lower

Source: Delmarva Consumer Seafood Survey and Calculations

Government's Role

Over 90 percent of consumers felt fresh fish and seafood should be inspected (Table 8). Of those who wanted seafood inspection, the majority of respondents favored inspection by a government agency. This percentage decreased, however, as age increased. Approximately 70 percent of consumers in the 18-34 group wanted government inspection, compared to 52.7 percent in the over 65 group (Table 9). Conversely, 18.4 percent in the 18-34 group desired inspection by industry officials, compared to 36 percent in the over 65 age group. Government inspection is favored by more males, over 67 percent, than females, 58 percent, while a higher percentage of females than males wanted inspection by the seafood industry. Desire for government inspection increased with higher education and higher income, while the desire for industry inspection decreased with higher education and income.

In general, people felt the government should inspect seafood, with the most support shown by younger respondents, males, and individuals with higher education and income. Industry inspection had the strongest support from older, female, less educated, and lower income respondents. The government agency most

favored to carry out seafood inspection is the USDA, as indicated by nearly 50 percent of all respondents.

Table 8
Consumer Opinion of
Whether Fresh Fish and Seafood
Should be Inspected, Delmarva, 1991

Response	N	Percent
Yes	1264	90.9
No	43	3.1
No Opinion	83	6.0
No Response	63	N/A
TOTAL	1463	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

In addition to inspection, the federal government should also require nutritional labeling on fresh fish and seafood in the opinion of 58.8 percent of respondents (Table 10). The harvest date of fresh fish and seafood was selected as necessary information on nutritional labels by 85 percent of respondents, and 77.1 percent believed that additives should also be reported (Table 11). Cholesterol and fat were selected by 72.2 and 70.7 percent of consumers, respectively, as components they wished to see on nutrition labels. Harvest location was also cited by 67 percent of consumers. Other factors such as sodium content and calories were selected by 62.5 and 60.1 percent of consumers, respectively.

Consumer desire for knowledge about cholesterol, fat, sodium, and calories is not surprising since concern over these factors are common to many studies about food safety. However, several additional labeling components for seafood safety were indicated by consumers: additives, harvest date, and harvest location.

Table 9
Consumer Opinion of
Who Should Be Responsible
For Inspecting Fresh Fish and Seafood,
Delmarva, 1991

Characteristic	<i>Who Should Inspect</i>				Total
	Government	Seafood Industry	Other	No Response	
	<i>percent</i>				
<u>AGE</u>					
18-34	70.4	18.4	9.0	2.2	100.0
35-49	65.3	25.3	6.7	2.7	100.0
50-64	59.0	29.5	8.4	3.1	100.0
65 and over	52.7	3.1	7.7	3.5	100.0
<u>SEX</u>					
Male	67.2	24.1	6.4	2.3	100.0
Female	58.1	29.5	9.1	3.3	100.0
<u>EDUCATION</u>					
Less than H.S.	63.2	36.8	0.0	0.0	100.0
H.S. Graduate	60.0	29.0	8.7	2.3	100.0
Some College	64.1	26.2	9.7	0.0	100.0
Bachelor Degree	68.0	20.1	7.5	4.4	100.0
Some Grad. work or degree	70.5	18.0	7.7	3.8	100.0
<u>INCOME</u>					
< \$10,000	51.0	38.8	8.2	2.0	100.0
\$10,000-19,999	53.3	39.1	7.6	0.0	100.0
\$20,000-29,999	56.0	32.7	9.3	2.0	100.0
\$30,000-39,999	65.9	28.4	5.2	0.5	100.0
\$40,000-49,999	64.7	22.7	9.3	3.3	100.0
\$50,000-59,999	62.8	27.0	6.1	4.1	100.0
\$60,000-69,999	69.5	20.0	6.7	3.8	100.0
\$70,000-79,999	72.6	17.7	6.5	3.2	100.0
\$80,000 or higher	63.7	23.4	7.1	5.8	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

Table 10
Consumer Preference for
Federal Government Required
Nutrition Labeling of Fresh Seafood,
Delmarva, 1991

<u>Response</u>	<u>N</u>	<u>Percent</u>
Yes	804	58.8
No	360	26.3
No Opinion	203	14.9
No Response	<u>96</u>	<u>N/A</u>
TOTAL	1463	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

Table 11
Consumer Preference for
Nutrition Label Components,
Delmarva, 1991.

<u>Component</u>	<u>N</u>	<u>Percent</u>
Harvest Date	682	85.0
Additives	618	77.1
Cholesterol	579	72.2
Fat	567	70.7
Harvest Location	537	67.0
Sodium	501	62.5
Calories	482	60.1
Protein	372	46.4
Vitamins	306	38.2
Minerals	285	35.5
Carbohydrates	251	31.3
Other	43	12.3

Source: Delmarva Consumer Seafood Survey and Calculations

Higher income individuals were more likely to indicate that food additives should be included in nutritional labeling on fresh fish and seafood (Table 12). Of individuals with income under \$20,000, 67 percent indicated that additives

should be included, while more than 75 percent of individuals with income greater than \$20,000 indicated additives should be a part of nutritional labeling on fresh fish and seafood.

Table 12
Consumer Preference for Additives to be
A Part of Nutritional Labeling of
Fresh Seafood, Delmarva, 1991

<u>Income</u> <u>Category</u>	<u>Rating</u>	
	<u>Yes</u>	<u>No</u>
	<u>percent</u>	
Under \$10,000	63.9	36.1
\$10,000 - \$19,999	66.1	33.9
\$20,000 - \$29,999	81.5	18.5
\$30,000 - \$39,999	75.4	24.6
\$40,000 - \$49,999	85.2	14.8
\$50,000 - \$59,999	80.2	19.8
\$60,000 - \$69,999	85.7	14.3
\$70,000 - \$79,999	80.9	19.1
\$80,000 and above	74.7	25.3

chi-square = 16.993
 prob = .030
 gamma = .109

Source: Delmarva Consumer Seafood Survey and Calculations

Nearly sixty percent of respondents agreed that the degree of government regulations in the fresh fish and seafood industry should be increased, while 19.0 percent indicated regulations should not be increased (Table 13). This is in agreement to the sentiment that the government should inspect seafood, as well as require nutritional labeling on seafood.

Table 13
Consumer Agreement that
The Degree of Government Regulations
Concerning Fish and Seafood Production,
Harvesting and Processing
Should be Increased, Delmarva, 1991

<u>Response</u>	<u>Number</u>	<u>Percent</u>
1 Strongly Disagree	104	7.4
2	75	5.4
3	87	6.2
4 No Difference	301	21.6
5	237	17.0
6	240	17.2
7 Strongly Agree	352	25.2
No Response	<u>67</u>	<u>N/A</u>
TOTALS	1463	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

Purchasing Determinants

Freshness/appearance, with a mean of 1.51 on a 1-7 scale, was the most important factor affecting consumer purchasing decisions for seafood as compared with the purchase of other meat products (Table 14). This emphasis on freshness and appearance implies that strict attention to product display and quality control within the seafood department could make a difference in sales. Following freshness/appearance in importance were flavor, food poisoning/contamination, and availability, with means of 1.64, 2.03 and 2.07, respectively. Nutrition and healthfulness had a mean of 2.21, while price was the sixth most important factor with a mean of 2.35. Again, government inspection and nutritional labeling were important to consumers, with means of 2.9 and 3.85, respectively.

Whether the seafood was farm raised or not made little difference to consumers, with a mean of 4.44. Considering the press coverage of polluted streams, rivers, and other waterways where seafood is harvested, this was an unexpected response. One would assume that raising fish and seafood under controlled conditions would result

in at least the perception of a safer product. Advertising, with a mean of 5.26, was rated as the least important factor in consumer purchasing decisions for seafood versus other meat products.

Table 14
Factor Importance in Seafood versus
Other Meat Purchasing Decisions,
Delmarva, 1991

<u>Factor</u>	<u>Mean^a</u>	<u>Std. Deviation</u>
Freshness/Appearance	1.51	1.19
Flavor	1.64	1.15
Food Poisoning/Contamination	2.05	1.83
Availability	2.07	1.59
Nutrition/Healthfulness	2.21	1.60
Price	2.35	1.60
Texture/Tenderness	2.39	1.65
Fish Odor	2.58	1.97
Presence of Bones	2.78	1.91
Government Inspected	2.90	2.01
Ease of Preparation	2.95	1.76
Environmental Effect	3.25	2.01
Nutritional Labeling	3.85	2.17
Packaging	3.91	2.03
Farm Raised	4.44	2.01
Brand Name	4.69	1.96
Advertising	5.26	1.97
Other	1.81	1.74

^a 1 = Very Important 7 = Very Unimportant

Source: Delmarva Consumer Seafood Survey and Calculations

Consumer Attitudes and Opinions *Concerning Selected Seafood Issues*

Forty-three percent of respondents were indifferent when asked if they believed eating farm raised fish and seafood is safer than eating fresh wild caught fish and seafood (Table 15). Additionally, approximately 55 percent of consumers disagreed to strongly disagreed to preferring imported over domestically produced fish

and seafood, while 36.6 percent indicated no preference (Table 16).

Table 15
Consumer Agreement to Feeling Safer Eating Farm Raised Fish and Seafood Than Fresh Wild Caught Fish and Seafood, Delmarva, 1991

<u>Response</u>	<u>Number</u>	<u>Percent</u>
1 Strongly Disagree	130	9.4
2	101	7.3
3	145	10.5
4 No Difference	594	43.0
5	134	9.7
6	109	7.9
7 Strongly Agree	168	12.2
No Response	<u>82</u>	<u>N/A</u>
TOTALS	1463	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

Table 16
Consumer Agreement to Preferring Imported To Domestically Produced Fresh Fish And Seafood, Delmarva, 1991

<u>Response</u>	<u>Number</u>	<u>Percent</u>
1 Strongly Disagree	481	34.6
2	178	12.8
3	109	7.8
4 No Difference	510	36.6
5	32	2.3
6	24	1.7
7 Strongly Agree	58	4.2
No Response	<u>71</u>	<u>N/A</u>
Totals	1463	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

The risks associated with eating raw fresh fish and seafood have not been exaggerated in the opinion of 41 percent of respondents, while just under 30 percent indicated the risks of eating raw fresh fish and seafood have been exaggerated (Table 17). Less than twenty percent of respondents indicated they disagreed that producing fish and seafood products on farms is more environmentally appropriate than harvesting the wild population (Table 18). Respondents who slightly agreed to strongly agreed included 42.7 percent, while 37.5 percent indicated that they held no opinion on the subject. Approximately 48 percent of consumers indicated that the quality of healthfulness of fresh fish and seafood today is higher than it was five years ago, while 12.2 percent of respondents rated today's seafood healthfulness as lower (Table 19).

Table 17
Consumer Agreement that the Risks Associated with Eating Raw Seafood Have been Exaggerated, Delmarva, 1991

<u>Response</u>	<u>Number</u>	<u>Percent</u>
1 Strongly Disagree	258	18.5
2	155	11.1
3	159	11.4
4 No Difference	405	29.1
5	155	11.1
6	100	7.2
7 Strongly Agree	162	11.6
No Response	<u>69</u>	<u>N/A</u>
TOTALS	1463	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

Table 18
Consumer Agreement that Producing Fish
And Seafood Products on Farms is
More Environmentally Appropriate than
Harvesting Wild Population, Delmarva, 1991

<u>Response</u>	<u>Number</u>	<u>Percent</u>
1 Strongly Disagree	88	6.3
2	69	5.0
3	116	8.4
4 No Difference	521	37.5
5	193	13.9
6	206	14.8
7 Strongly Agree	195	14.0
No Response	<u>75</u>	<u>N/A</u>
Totals	1463	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

Table 19
Consumer Rating of the Overall Quality
Of Healthfulness of Fresh Fish and Seafood
Available Today versus Five Years Ago,
Delmarva, 1991

<u>Response</u>	<u>Number</u>	<u>Percent</u>
1 Higher	164	12.0
2	211	15.4
3	279	20.4
4 No Difference	547	40.0
5	80	5.8
6	48	3.5
7 Lower	40	2.9
No Response	<u>94</u>	<u>N/A</u>
TOTALS	1463	100.0

Source: Delmarva Consumer Seafood Survey and Calculations

Summary and Conclusions

Currently, 96.1 percent of consumers in Delmarva consume fresh seafood. The predicted growth, therefore, will come mainly from current consumers increasing their consumption, and only a small amount of overall growth will come from consumers who currently do not consume fresh seafood.

Per capita consumption of fresh fish and seafood in Delmarva has grown over the past five years, while per capita consumption of dairy products, beef, pork, and eggs have declined. In fact, consumers in Delmarva stated that their consumption of fresh seafood has increased nearly as much as their consumption of poultry has in the past five years. A factor related to these trends may be the fact that consumers view the healthfulness of fresh seafood to be higher than the healthfulness of beef, pork, and poultry.

The study reveals that consumers want freshness and a good appearance, flavor, safety (free from poisoning or contamination), and nutrition made easily available to them. These factors were all rated ahead of price in importance, which helps explain why fresh seafood consumption has risen even though consumers view its price to be higher than beef, pork, and poultry prices.

While seafood price was rated less important than freshness, appearance, flavor, safety, and nutritional content, its importance can not be overlooked. The top three reasons given for not eating fresh seafood were taste, odor, and price. It could be hypothesized that consumers are willing to pay more for fresh fish and seafood, but if the price is too much higher in comparison to poultry, beef, and pork, consumers will decrease their seafood purchases. While seafood price effects are not known in any certainty, the study of price and consumer willingness-to-pay is an area in which further study would be useful.

The majority of consumers surveyed want their seafood to be inspected. The government is the first choice of consumers to inspect seafood. Younger, male, more highly educated, and higher income respondents favor government most strongly, while some older, female, lower edu-

cated, and lower income individuals favor inspection by the seafood industry.

A majority of consumers also favor mandatory nutrition labels put on fresh fish and seafood. In addition to cholesterol, fat, sodium, and calories, strong desire exists to include information about additives, harvest date, and harvest location. Generally, younger, more educated, and higher income respondents indicated that they wanted this information reported on a label.

Overall, the majority felt that government regulations in the fresh fish and seafood industry should be increased. Inspection and mandatory labeling are certainly consumer response to their desire for safe seafood products. Interestingly, consumers do not view farm-raised fish and seafood to be any safer than wild-caught products.

References

Byrne, Patrick J., Conrado M. Gempesaw II, and Ulrich C. Toensmeyer. "An Evaluation of Consumer Pesticide Residue Concerns and Risk Information Sources." *Southern Journal of Agricultural Economics* 23,2(1991):167-174.

Dowdell, Stephen. "Fish, Seafood Shortages Projected." *Supermarket News*. September 24, 1990, p. 46.

Harvey, David. "Aquaculture: A Diverse Industry Poised For Growth," *National Food Review*. USDA/ERS Washington, DC. 14,4(1991):18-23.

Institute of Medicine. *Seafood Safety*. Farid E. Ahmed, Editor. National Academy Press, Washington, DC. 1991.

Mellor, John W. "Food Aid and Nutrition." *American Journal of Agricultural Economics*. 62,(1980):979-983.

National Marine Fisheries Service. *Fisheries Statistics of the United States--1989*. Current Fisheries Statistics No. 8900. 1990. Washington, D.C.

National Oceanic and Atmospheric Administration. *Meeting the Challenge: New Directions in Seafood Inspection*. 1990. Pascagouls, Miss.

Putnam, Judith Jones and Jane E. Allshouse. *Food Consumption, Prices, and Expenditures, 1970-90*. CED/ERS/USDA. Statistical Bulletin Number 840. August 1992.

Quick Frozen Foods International. "It's Farmed Fish or Too Few Fish To Meet the 21st Century's Demands." 32(April 1991):132.

Rogness, Ronald V. and Lee J. Weddig. "A Word to the Wise Fisherman: Imports to Play a Bigger Role for U.S. Consumer." *National Fisherman Annual*. 1991, p. 74-96.

Stutzman, Curtis. March 1992. Tilapia Status Report, American Tilapia Association. Amana, Iowa.

Targeting Market Service, a division of TRW, Richardson, Texas.

The Food Institute. *Frozen Fish and Shellfish*. Fair Lawn, NJ. July 1992.

The National Fish and Seafood Promotional Council. *Analysis of Consumer Perspectives on Fish and Seafood*. Roseleen L. Moore, Chairman. Washington, DC. October 1991.

U. S. Department of Agriculture. *Aquaculture Situation and Outlook Report*. Economic Research Service. Various issues.