

Quantification of Fish and Seafood Consumption Rates for Connecticut

by:

Nancy C. Balcom
Constance M. Capacchione
Diane Wright Hirsch

Submitted to the
Connecticut Department of Environmental Protection
Office of Long Island Sound Programs
Contract No. CWF-332-R

by the
Connecticut Sea Grant College Program
1084 Shennecossett Road
Groton, CT 06340

in collaboration with
The University of Connecticut, Department of Nutritional Sciences,
and The University of Connecticut Cooperative Extension System

Quantification of Fish and Seafood Consumption Rates for Connecticut

Contract No. CWF-332-R

Submitted to the
Connecticut Department of Environmental Protection,
Office of Long Island Sound Programs

January 22, 1999

By

Nancy C. Balcom¹
Constance M. Capacchione²
Diane Wright Hirsch³

¹Connecticut Sea Grant College Program
Sea Grant Extension Program
University of Connecticut
1084 Shennecossett Road
Groton CT 06340

²Department of Nutritional Sciences
University of Connecticut
3624 Horsebarn Rd. Ext., U-17
Storrs CT 06269
(currently at Tufts University)

³Cooperative Extension System
University of Connecticut
305 Skiff Street
North Haven CT 06473

CT-SG-99-02



Table of Contents

List of Tables	iv
List of Figures	vi
List of Appendices	vii
Abstract	viii
Acknowledgements	ix
Executive Summary	x
Introduction	1
Comparison of Consumption Rates	1
At-Risk Groups	2
Defining and Identifying Risk	6
Statement of Problem and Hypotheses	9
Study Objectives	10
Hypotheses	10
Methods	12
Survey Tools	12
Review of Options	12
Portion Size Determination	13
Survey Tool for this Study	14
Follow-up	15
Pilot Study	15
Changes Resulting from Pilot Study	16
Study Populations and Sample Size	16
General Population	17
Sample Size Methodology	17
Study Sample Population	19
Commercial Fishing Population	20
Sample Size Methodology	20
Study Sample Population	21
Sport Fishing and Cultural/Subsistence Fishing Population	21
Sample Size Methodology	21
Study Sample Population	22
Minority and Limited Income Populations	22
Southeast Asian Population	22
Sample Size Methodology	23
Study Sample Population	23
Non-Southeast Asian Minority Population	23
Sample Size Methodology	24
Study Sample Population	24

Table of Contents continued

Limited Income Population	25
Sample Size Methodology	25
Study Sample Population	25
Women of Childbearing Age and Children Populations	25
Sample Size Methodology	25
Study Sample Population	25
Survey of Seafood Sources	26
Data Entry and Manipulation	26
Conversion of Portions to Cooked, Edible Weight Basis	26
Whole Fish Reductions	27
Results	28
Population Demographics	28
Species Consumed and Seafood/Fish Sources	30
Frequency of Consumption, Meal Size, and Seasonal Patterns	34
Frequency of Fish and Seafood Meals	37
Average Meal Size	37
Mean Number of Meals of Fish/Seafood Per Year	41
Monthly and Seasonal Consumption Patterns	44
Total Fish and Seafood Consumption	44
Preparation and Cooking Practices	55
Trimming of Skin and Fatty Tissues	55
Parts Eaten	56
Cooking Practices	56
Non-Commercial Fishing Practices	56
Fishing Activity in Connecticut Waters	56
Frequency of Fishing Activities	69
Fishing Locations	70
Awareness of Fish Consumption Advisories	71
Availability of Locally-Harvested Seafood	75
Harvesters	75
Retailers, Distributors and Restaurants	75
Conclusions	79
References	84
Appendices	A-1

List of Tables

Table 1.	Summary of consumption studies including or focusing on seafood	4
Table 2.	Sample sizes required for specific populations	17
Table 3.	Comparison of Database America household database to 1990 household census data	20
Table 4.	Percent of fully completed survey returns by county, compared to 1990 census data	20
Table 5.	Household demographics by population	31
Table 6.	Individual demographic information by population for members of all households	33
Table 7.	Percent of respondents who eat “target” fish	35
Table 8.	Sources of fish and seafood in Connecticut by species and population	36
Table 9.	Frequency of fish/seafood consumption by population	38
Table 10.	Mean meal size (ounces) per time and mean number of fish/seafood meals per year	42
Table 11.	Mean total grams of fish/seafood per day by population	50
Table 12.	Comparison of mean total consumption (gm/day) to national consumption value	51
Table 13.	Comparisons within populations of total mean consumption by age/gender categories	53
Table 14.	Individual trimming practices by population	57
Table 15.	Species of fish trimmed by population	57
Table 16.	Parts of fish/seafood eaten by population and species	59
Table 17.	Typical cooking methods used by Southeast Asian households for fish/seafood	68
Table 18.	Individual fishing activities and related consumption by population	72
Table 19.	Household responses to fish consumption advisory questions	74
Table 20.	Commercial species harvested in Long Island Sound	75

List of Tables continued

Table 21.	Types of operations to which harvesters sell fish/seafood from Long Island Sound	76
Table 22.	Species harvested in Long Island Sound sold in Connecticut during 1996	76
Table 23.	Percent of total harvest and quantity (pounds) by species sold in Connecticut in 1996	77
Table 24.	Percent of Long Island Sound fish/seafood purchased, sold or served in Connecticut	78
Table 25.	Species from Long Island Sound sold or served by Connecticut retailers and restaurants	78
Table 26.	Percent of total amount purchased by species that came from Long Island Sound and sold/served in Connecticut	78

List of Figures

Figure 1.	Frequency patterns for seafood consumption by population	39
Figure 2.	Mean meal size per time by population	43
Figure 3.	Mean number of meals of fish/seafood per year by population	43
Figure 4.	Monthly consumption patterns by species for total population	45
Figure 5.	Percent of people who trim fish prior to cooking by species and population	58
Figure 6.	Parts of locally-caught fish/seafood eaten, by species and population	63

List of Appendices

Appendix 1. Connecticut fish consumption advisories	A-1
Appendix 2. Food frequency survey tool	A-5
Appendix 3. Spanish and Vietnamese versions of food record	A-11
Appendix 4. Fish and seafood species code list	A-17
Appendix 5. NCE food portion visual	A-18
Appendix 6. Ten-day food record	A-20
Appendix 7. Household and individual demographics questions	A-23
Appendix 8. Southeast Asian survey form	A-26
Appendix 9. Follow-up postcard	A-28
Appendix 10. Pilot study form	A-30
Appendix 11. Angler database sampling methodology	A-39
Appendix 12. Income scale for limited income population	A-48
Appendix 13. Harvester survey form	A-50
Appendix 14. Retailer/Restaurant/Wholesaler survey form	A-53
Appendix 15. Measures, conversions and weights for portions	A-56
Appendix 16. Average meal size and number of meals/year by population for five saltwater species	A-69
Appendix 17. Monthly consumption patterns by species and population	A-72
Appendix 18. Mean consumption (gm/day) by species and population	A-83
Appendix 19. Fishing locations by species and population	A-92
Appendix 20. Household demographics for total populations answering fish consumption advisory questions	A-97
Appendix 21. Individual demographics of households answering fish consumption advisory questions	A-99

Abstract

A study of the fish and seafood consumption rates and patterns of nine Connecticut populations was undertaken from 1996-1997: general population households, sport fishing households, commercial fishing households, limited income households, minority households including two sub-populations, Southeast Asian and non-Southeast Asian minority households, women age 15 to 45 years, and children less than 15 years of age. These populations were not mutually exclusive.

Fish and seafood consumption by individuals was collected using a food frequency recall tool. Portion sizes were determined using the Nutrition Consulting Enterprises 2D Food Portion Visuals, converted to cooked, edible weight basis. General population and commercial fishing household data were collected through a mail survey, while data from rarer populations were collected using personal interviews.

Mean consumption rate (g/day) was calculated and compared to a national average of 14.3 g/day. All populations had mean consumption rates significantly greater than 14.3 g/day ($P < .05$): general population at 27.7 g/day (1.0 oz/day), sport fishing at the rate of 51.1 g/day (1.8 oz/day), commercial fishing at 47.4 g/day (1.7 oz/day), limited income at 43.1 g/day (1.5 oz/day), minorities at 50.3 g/day (1.8 oz/day), Southeast Asians at 59.2 g/day (2.1 oz/day), non-Asian minorities at 44.8 g/day (1.6 oz/day), women ages >15 and ≤ 45 at 46.5 g/day (1.6 oz/day) and children ≤ 15 years at 18.3 g/day (0.6 oz/day). Significant differences between mean consumption rates among age/gender categories were found within the sport fishing, limited income, minority, Southeast Asian and children populations.

Mean meal size per time (ounces) and mean number of meals per year for fish and seafood both caught locally and purchased at a store or restaurant were calculated. Mean meal sizes for purchased fish were in the range of 3-5 ounces, while mean meal sizes for locally-caught fish were in the 4-7 ounce range.

Respondents' familiarity with state-issued fish consumption advisories, fish trimming practices, monthly patterns of consumption, and sources of commercially available fish and seafood in Connecticut were also documented.

The results of this study provide strong evidence that Connecticut residents consume fish and seafood at a rate that greatly exceeds U.S. estimates currently used in risk assessment calculations.

Acknowledgements

We would like express our appreciation for the efforts of the following individuals, who helped make it possible to carry out and complete this extensive project:

Mai Nguyen, for making contact with and interviewing numerous Vietnamese, Cambodian, Laotian and Hmong families, and providing us with incredibly detailed and comprehensive data that we would not have been able to obtain otherwise; *Kimberly Murphy*, for completing the arduous task of entering this massive dataset, making numerous telephone calls, and interviewing women at WIC clinics; *Rebecca Crowell*, *Cherie Galat*, *Christina Emerson* and *Marla Baroncini*, for making telephone calls, mailing the surveys, entering and checking the data, and interviewing women at WIC clinics; *Tina Sullivan* and *Ted Gantek III*, for interviewing anglers in the field; *Doug Jann* for coordinating the angler sampling effort, and for his contributions to the early part of the study; *Cheryl Rautio* and *Zoraida Rivera*, for interviewing EFNEP clients for the survey, and *Irene Schalla*, for mailing out the gift certificates and fielding phone calls.

This project was supported by The Connecticut Department of Environmental Protection, Office of Long Island Sound Programs, through the Long Island Sound Research Fund, Grant No. CWF-332-R. Significant additional funding and support were provided by the University of Connecticut through the Connecticut Sea Grant College Program, the Department of Nutritional Sciences, the Cooperative Extension System, and the Research Foundation. NCE food portion visuals were partially purchased with funds contributed by the Department of Nutritional Sciences.

Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of the Connecticut Department of Environmental Protection.

Executive Summary

Concerns about the safety of seafood from Long Island Sound and the fresh waters of Connecticut and the greater exposure of some populations to potentially contaminated fish prompted this study to obtain more accurate estimates of fish and seafood consumption, to document the sources of the fish and seafood consumed in Connecticut, and to establish patterns of consumption.

This study provides estimates of mean fish and seafood consumption rates for the general Connecticut population, as well as eight other populations considered to be potentially at greater risk of exposure to marine and freshwater fish contaminated with chemical contaminants such as PCBs and mercury. The eight sub-populations are: sport fishing households, commercial fishing households, limited income households, minority households, including two subsets: Southeast Asian households, and non-Asian households, women of childbearing age (>15 and ≤ 45 years), and children ≤ 15 years. The populations are not mutually exclusive. The fish and seafood consumption rates and patterns of 2,354 individuals (1,048 households) overall are represented in this study.

Mean meal size per time (ounces) for "caught" and "bought" fish are calculated by population, along with the average number of "caught" and "bought" meals per year. Consumption rates are also reported by species. Fish trimming practices, cooking practices (Southeast Asian households only), monthly consumption patterns, parts of the fish and seafood typically consumed, fishing locations, and familiarity with state-issued fish consumption advisories are also documented by population.

For all populations, the entire household was sampled. Typical fish and seafood consumption was documented using a food frequency recall tool, with portion sizes determined using 2D Food Portion Visuals developed by Nutrition Consulting Enterprises. These visuals enabled respondents to choose both a shape and thickness that most closely resembled his/her portion, which could then be easily converted to gram weight. All portions reflect the cooked, edible weight basis of the fish or seafood, with the exception of shellfish recorded as consumed raw.

The general population households were selected using a purchased database, which provided randomly selected households from the eight Connecticut counties, weighted in proportion to county population. The households were mailed surveys over a period of 45 weeks between 1996 and 1997, and 207 fully complete returns representing 434 individuals were received.

The commercial fishing households were randomly selected from the database of commercial-license holders maintained by the Connecticut Department of Environmental Protection. These households also received a mail survey; 73 returns representing 178 individuals were used.

A database of saltwater sport fishermen was compiled using an interview process at selected shoreside fishing sites and boat ramps. In-depth interviews of anglers were conducted in the field, and surveys were mailed to collect household members' data. Sport fishing households identified through the general mail survey or other interviews were also included. This study population contained 348 households and 514 individuals.

Minority income households were reached primarily through personal interviews. A native Vietnamese interviewer contacted and met with members of 89 Vietnamese, Cambodian, Laotian and Hmong households (the Southeast Asian population), representing 329 individuals. Non-Asian minority households were reached through interviews with consenting participants at Women, Infant and Children clinics throughout Connecticut, and clients of the Expanded Food and Nutrition Education Program directed by the University of Connecticut Cooperative Extension System. The non-Asian portion of the minority households totaled 245 households and 860 people.

Limited income households were derived from the entire survey population, using a sliding scale of household income and household size; resulting in 276 households and 937 individual for this population. The population of women of childbearing age was derived from the total population, using birth dates to determine the pool of women between the ages of >15 and ≤ 45 years. This encompassed 493 women. The population of children ≤ 15 years was also derived from the total population using birth dates, resulting in a population of 559 children.

The frequency in which fish and seafood is typically consumed ranged from no meals to 5 or more meals per week. Of those households that consume fish or seafood, 31-43% consume 1-2 meals per week of fish or seafood.

Mean consumption rate (g/day) was calculated and compared to a national average of 14.3 g/day. All populations have mean consumption rates significantly greater than 14.3 g/day ($P < .05$): general population at the rate of 27.7 g/day (1.0 oz/day), sport fishing at 51.1 g/day (1.8 oz/day), commercial fishing at 47.4 g/day (1.7 oz/day), limited income at 43.1 g/day (1.5 oz/day), minorities at 50.3 g/day (1.8 oz/day), Southeast Asians at 59.2 g/day (2.1 oz/day), non-Asian minorities at 44.8 g/day (1.6 oz/day), women ages >15 and ≤ 45 at 46.5 g/day (1.6 oz/day) and children ≤ 15 years at 18.3 g/day (0.6 oz/day). Southeast Asian and sport angler households consume fish and seafood at the highest rates, while children and the general population consume fish and seafood at the lowest rates. These consumption rates and frequencies may reflect the increased emphasis that fish and seafood has received over the last decade or so as a healthy source of protein.

Comparisons within populations revealed significant differences between mean consumption rates among some of the age/gender categories (children ≤ 15 years, women >15 and ≤ 45 years, women >45 and ≤ 65 years, men >15 and ≤ 65 years, and adults >65 years), with the exception of the general, commercial fishing, and non-Asian minority populations. Minority sport fishing households have a significantly greater consumption rate than Caucasian sport fishing households ($P < .05$), while consumption rates of angler limited income households are significantly greater than non-angler limited income households ($P < .01$). Children ≤ 10 years of age consume fish and seafood at rates significantly lower than children >10 and ≤ 15 years ($P < .01$).

Average meal size per time of "bought" fish range from 3-5 ounces, while average meals of "caught" fish range from 4-7 ounces among populations. The average number of "bought" fish meals range from 10.4 (general population) to 32.9 (Southeast Asians), while the average number of "caught" meals range from 5.4 (general population) to 10.2 (commercial fishing population).

Monthly patterns of consumption varies the most seasonally for species such as striped bass, bluefish, porgy, blackfish, flounder, freshwater bass, carp, catfish, trout, perch, sunfish, lobsters, clams, and blue crab, peaking in the warmer months of the year. Most commercially available species or forms of fish/seafood, such as canned tuna, pollock and codfish, exhibit no variations in seasonal or monthly consumption patterns.

Responses to questions regarding the practice of trimming fish prior to cooking to remove skin and fatty tissues reveal that trimming is less likely to occur in minority and limited income populations for species like striped bass and bluefish. Similarly, responses to questions regarding which parts of the fish or seafood are typically eaten reveal that the majority of the populations typically consume the meat only. Minority and limited income populations, most particularly the Southeast Asians, are more likely to make use of the entire fish or seafood, including meat, head, skin/fins, eyes, organs, roe, bones and fat/oil. Lobster tomalley and blue crab mustard are eaten by a smaller percentage of the study populations.

Of the individuals included in the sport angling population, more than 77% fish in the fresh waters of Connecticut, while 62% fish in Long Island Sound. Seventy percent eat the freshwater fish caught, while 80% consume the marine species caught. Fishing activity and consumption rates of locally-caught fish is greater for Southeast Asians than non-Southeast Asian minorities, for both freshwater and saltwater species.

For all populations except sport fishing and commercial fishing, more than 80% of those surveyed do not fish at all. The majority of individuals fish between 1 and 12 times per year. Fishing locations were documented by species.

Household awareness of and compliance with State of Connecticut-issued fish consumption advisories was assessed. Less than half of the general population households (47%) are aware of the advisories' existence, compared to 63% of the sport fishing households and 81% of the commercial fishing households. Only 31% of the minority households and 37% of the limited income households are aware of the advisories, and less than 17% of the Southeast Asian households interviewed know about them, even though they are posted in Vietnamese, Cambodian, Laotian, and Hmong. Only 47% of the

commercial fishing households and one-third of the sport fishing households know to which fish the advisories apply. The majority of households interviewed do not know where to obtain information about the advisories.

Surveys of harvesters, seafood distributors and restaurants were conducted to determine the amount of fish and seafood harvested in Long Island Sound that is available to consumers in Connecticut. This is not easily determined. Among the species harvested from Long Island Sound and sold in Connecticut are lobster, whelk (conch), hard clams, blackfish, oysters, bluefish, porgy, and flounder/fluke. Of those surveyed, 50% of the wholesalers, 66% of the retailers, and 44% of the restaurants do purchase, sell or serve seafood from Long Island Sound, predominantly lobster, hard clams, oysters and bluefish.

This study provides an extensive documentation of fish and seafood consumption practices and patterns for the general population of Connecticut, as well as eight other sub-populations considered at higher risk for potential exposure to contaminants in some species of fish and seafood. The results of this study provide strong evidence that Connecticut residents consume fish and seafood at a rate that greatly exceeds U.S. estimates currently used in risk assessment calculations.

I. Introduction

The safety of seafood from Long Island Sound is a concern shared by consumers and state regulators alike. How much and what type of seafood is eaten? When advisories are given, are they based on reasonable consumption estimates? These are some of the questions that need to be answered, to provide validity and give credence to seafood and shellfish consumption advisories.

In January 1992, following U.S. Environmental Protection Agency (EPA) guidelines and water quality criteria developed for estuarine waters, the Connecticut Department of Environmental Protection (CTDEP) adopted water quality standards that “protect humans from adverse health risks associated with consumption of fish and shellfish exposed to contaminants at criteria concentrations” (WQS, 1992). The criteria were derived using the following assumptions: a 1×10^{-6} risk level, 70 kilogram adult, lifetime exposure, and either 6.5 grams/day of seafood consumed or 6.5 g/day seafood plus 2 liters drinking water/day consumed (US EPA, 1980). Human health criteria regarding exposure to concentrations of toxicants in seafood are based on national consumption levels that may be lower than the average seafood consumption rate in a coastal state like Connecticut.

A. Comparison of Consumption Rates

Calculations of daily consumption rates for seafood range widely (Table 1). Official Department of Commerce (DOC) figures indicate that per capita consumption increased 24 percent between 1974 and 1994. DOC annual per capita consumption calculations add landing data to imports on a species by species edible weight basis. These figures are corrected for exports and inventories, and divided by the U.S. population to provide per capita “disappearance “ information, generally falling between 14 and 15 pounds per person per year. These numbers are useful to assess trends, but are inadequate for accurate risk and health assessments associated with seafood consumption (NFI, 1994). These estimates are high because they do not account for waste, spoilage, seafood used for pet foods and livestock feed. The estimates also do not include commercial freshwater catches or recreational catches of fish (Wagstaff *et al.*, 1986).

The U.S. Department of Agriculture (USDA) estimated mean fish consumption by adults in the United States to be about 15 g/day, or about 36 meals per year (USDA Agricultural Statistics, 1984). A survey by Market Facts, Inc. for the National Marine Fisheries Service (NMFS) from 1969-1970 determined mean total fish consumption as 16.7 g/day for both freshwater and saltwater species commercially purchased and recreationally caught (Hu, 1985). In this study, a diary of fish consumption was kept over a one-year period. Estimates of consumption rates were highest among residents of New England. Rupp (1980), using a 30-day record, found mean consumption to be 12.7 g/day.

The National Dairy Purchase Research survey conducted between 1973-74 relied on one-month records to calculate estimates of national fish consumption in the U.S. (Javitz, 1980), covering both recreationally caught and commercially purchased fish. Average fish consumption for fresh and saltwater fish combined was 14.3 g/day with the upper 95th percentile consumption rate of 41.7 g/day. This study also found that 94% of children and 96-100% of adults eat some quantity of fish, with the quantity increasing with age. Approximately 90% of the total U.S. population consumes saltwater fish while 12-16% eat freshwater fish. Average consumption rates for the continental U.S. are 1.5 g/day for freshwater fish, 10.7 g/day for saltwater finfish, and 3.6 g/day for shellfish. In this study, the lowest average consumption rate for freshwater fish was 0.3 g/day, calculated for New England.

Degner *et al.* (1994) reported total mean consumption values of 43.0 g/day and 23.1 g/day for Florida residents and food stamp recipients, respectively. Other surveys report annual per capita seafood consumption in the range of 6.5 pounds to 14.7 pounds.

B. At-Risk Populations

Of particular concern are individuals with a greater risk of exposure to toxic contaminants in fish and seafood due to their livelihood (commercial fishermen and their families), behavior (subsistence or sport fishing activities), cultural preference (for freshly-caught fish) or life stage (women of childbearing age, pregnant and lactating women, and children ages 15 and younger. While the U.S. Food and Drug Administration (FDA) has the primary responsibility for regulating fish and seafood sold in interstate

commerce, state agencies are largely responsible for managing exposure to contaminants in local recreational and subsistence/cultural fisheries. State-issued fish consumption advisories or bans are used by state agencies to inform sport and cultural/subsistence anglers about the risks of consuming locally-caught, potentially-contaminated fish. Though anglers may be generally aware of fish consumption advisories, they may not change their behavior or they may misinterpret the advisories (Belton *et al.*, 1986). Barry *et al.* (1993) found that cultural differences and literacy levels can lead to misinterpretation of advisories.

There have been numerous studies of fish consumption by specific groups considered to be at higher risk for exposure to contaminated fish and seafood (Table 1). Connecticut sport anglers are believed to be one population at higher risk for exposure to contaminants by their consumption of certain fish species, or fish caught in certain waters. The Connecticut Departments of Public Health (CTDPH) and CTDEP have jointly issued fish consumption advisories, providing guidelines for certain fresh and saltwater fish species, water bodies, and sensitive population groups (CTDPH, 1996; Appendix 1). A survey of anglers conducted by CTDPH in 1986 found maximum consumption rates ranging from 10 g/day to 105 g/day (Toal, 1987). A study of Housatonic River anglers established a 2.6 g/day mean consumption rate (95th percentile=12 g/day) for sport fish only (Ebert *et al.*, 1996).

A study of Wisconsin anglers determined the mean daily intake of sport-caught fish was 12.3 g or 18 meals annually, while the daily intake for all fish meal sources (commercial and sport) was 26.1 g or 41 meals annually (Fiore *et al.*, 1989). A study of fish consumption patterns among Wisconsin Chippewa found an average of 1.2 fish meals consumed per week or 62.4 per year (Peterson *et al.*, 1994). West *et al.* (1993) found during a yearlong mail survey that total average fish consumption was 24.4 g/day (19.6 lbs./yr) and 14.5 g/day (11.7 lbs./yr) for sport-fish consumption in Michigan, after 2.2 g/day was subtracted to account for non-response bias.

Degner *et al.* (1994) examined three distinct populations in Florida – 15,672 household members for the overall population in Florida, 2,099 individuals living in counties exposed to industrial pollution by

Table 1. Limited summary of consumption studies including or focusing on seafood.

Study	Year	No. of households	No. of individuals	Annual Consumption Estimates
USDA Nationwide Food Consumption Survey (Hu, 1985)	1977-1978	~15,000	30,770	14.4 lbs. per capita
Market Facts, Inc. for NMFS (Wagstaff, 1984; Hu, 1985)	1969-1970	1,586	4,864	13.5 lbs. per capita at home only
NPD Research, Inc. for Tuna Research Institute (Hu, 1985)	1973-1974	7,985	26,953	12.3 lbs. per capita at home only
(Cordle <i>et al.</i> , 1978)	1978	7,985	26,953	Reevaluation of NPD study = 18.7 g/day
SRI International (Javitz, 1980)	1980	7,985	26,953	Re-evaluation of NPD study = 14.3 g/day, 95 th percentile = 41.7 g/day
MRCA Market Research Corporation of America for NMFS (Wagstaff <i>et al.</i> , 1986; Hu, 1985)	1981	7,500	12,000	6.5 lbs. per capita
USDA Agricultural Statistics	1984			15 g/day or 36 meals/year (adults)
Michigan sport anglers (West <i>et al.</i> , 1989)	1988	1,104	3,677	18.3 gms/day per capita (14.7 lbs./yr.)
Michigan sport anglers (West <i>et al.</i> , 1993)	1991-1992		2,684	24.4 g/day (19.6 lbs./person/yr.) for total average fish consumption; 14.5 g/person/day (11.7 lbs./person/day) for sport-fish consumption
Sport anglers (Toal, 1987)	1987			10 g/day – 105 g/day
Wisconsin anglers (Fiore <i>et al.</i> , 1989)	1989			12.3 g/day or 18 meals/yr sport caught fish; 26.1 g/day or 41 meals/year
Wisconsin Chippewa (Peterson <i>et al.</i> , 1994)	1994			1.2 fish meals/week or 62.4 meals/year
Per capita fish & shellfish consumption in Florida (Degner <i>et al.</i> , 1994)	1993 - 1994	8,000 – state sample 1,000 – paper mill sample 500 – food stamp recipients	15,672 – state sample 2,099 – paper mill sample 1,701 – food stamp recipients	43.0 g/day (16.80 kg or 36.97 lbs./yr) for state sample 53.2 g/day (19.04 kg or 41.89 lbs./yr) for paper mill sample 23.1 g/day (8.35 kg or 18.36 lbs./yr) for food stamp recipients
Lake Ontario fishing & fish consumption (Connelly and Knuth, 1994)	1994		2,500	17.9 g/d (14.4 lbs./yr) for overall annual fish consumption.
Connecticut Housatonic River Anglers (Ebert <i>et al.</i> , 1996)	1984-86		1,515	2.6 g/day mean and 12 g/day 95 th percentile sport fish only

paper mills, and 1,701 food stamp recipients, using telephone surveys and face-to-face interviews, finding that the total annual per capita seafood consumption was 16.80 kg (37 pounds) for the overall population; 19.04 kg (42 pounds) for the individuals in the paper mill sample, and 8.35 kg (18.4 pounds) for the food stamp recipients sample.

A study of subsistence fishermen along the Hudson River in 1991 and 1992 revealed that more than 35% of those surveyed ate fish in excess of the state recommended guidance levels (HRSC, 1994). Average consumption rates ranged from 22.7 g/day to 32 g/day, or 3-4 meals per month. Wendt (1986) conducted a limited study of New York low-income families' consumption patterns of sport-caught freshwater fish, with consumption averaging 17.5 meals/year and 13.3 g/day.

A study of the fishing and consumption patterns of Hmong families in Wisconsin revealed that more than half of the households surveyed went fishing, with one-third of those households fishing weekly (Hutchinson and Kraft, 1994). More than one-half of the households interviewed consume fish caught from local waters, with one-fourth of the households that fish consuming caught fish at least once weekly. The preferred fish was white bass, a species with wide-ranging contaminant levels, while carp and catfish appeared to be avoided. A pilot study conducted by the Minnesota Department of Natural Resources of known Hmong fishermen resulted in preliminary mean consumption rates of 23 g/day.

Chemicals contaminants in food can have a more immediate and deleterious effect on infants and young children. A number of studies have examined the potential for developmental delays in infants and children caused by the prenatal transfer of toxicants such as PCBs (polychlorinated biphenyls) and PBBs (polybrominated biphenyls) and DDT (dichlorodiphenyl trichloroethane) across the placenta from mother to developing baby, and through the breast milk during lactation (Jacobson *et al.*, 1984, 1989; Rogan *et al.*, 1986; Schwartz *et al.*, 1983; Wickizer *et al.*, 1981; Yakushiji *et al.*, 1984; Kodama and Ota, 1980; Fein *et al.*, 1984). An excellent summary of these concerns can be found in Barry *et al.* (1993). Since PCBs are lipid soluble, they accumulate in fatty tissues and are normally not excreted, except during lactation or times of extreme stress, such as during a terminal illness. Lactating women with high

concentrations of PCBs stored in their fat tissues may expose their infants to PCBs in utero or during breastfeeding.

Taylor *et al.* (1984) found that infants born to mothers occupationally exposed to PCBs had lower birthweights and a shorter mean gestational period. Displays of motor immaturity, a greater amount of startle, and abnormally weak reflexes were found in infants of mothers who consumed high levels of contaminated fish (Jacobson *et al.*, 1984). Fein *et al.* (1984) also reported lower birth weights and head size circumferences in infants of mothers who consumed moderate quantities of PCB-contaminated lake fish. However, developmental differences between babies exposed to PCB contaminants and unexposed babies diminishes near age four or five.

C. Defining and Identifying Risk

As risk communicators, fishery managers and regulators need to know their target audiences' situations and experiences to promote reasoned responses to the consumption advisory (Knuth, 1990). In identifying groups of people at risk, there is a tendency to label one group as "subsistence" fishermen. This group is poorly defined, and while there is undoubtedly a group of people who fish out of economic need, there are indications that cultural preference for freshly-caught fish may be exerting the greatest influence, particularly among Southeast Asians and Native Americans (Barry *et al.*, 1993; Peterson *et al.*, 1994). Therefore it seems appropriate to call this group "subsistence/cultural fishermen."

Guidance and technical assistance offered by the EPA to the states is based on the EPA's basic mandate of protecting and maintaining the nation's water quality. The 1987 amendments to the Clean Water Act required EPA to set numeric standards for a broad range of toxic substances where previously only narrative standards had been required (Reinert *et al.*, 1991). Currently, advisories based on the EPA's water quality-derived procedures rely on the technique of risk assessment. Risk assessment is a scientifically-based procedure used to estimate the probability of adverse health effects from a specified source under particular exposure conditions. Risk management is the process of integrating risk assessment data with social, economic, and political information to decide how to reduce or eliminate the

potential risks that are identified (Reinert *et al.*, 1991). While the FDA action levels and the EPA risk assessment procedures are based on the same principles, they are looking to protect different segments of the population. FDA action levels, under the authority of the Food, Drug, and Cosmetics Act, protect the general public from contaminants in fish shipped in interstate commerce (USEPA, 1989). Consumption advisories are based on FDA guidelines which use a "safe level" approach. Fish with contaminated residues that exceed FDA action levels are not to be consumed through interstate commerce, while those with residues below the action levels are considered safe for unlimited consumption. FDA action levels are not only based on risk assessment, but also risk management (e.g. economic impacts likely to affect commercial fishing industry).

In contrast, the purpose of the EPA risk assessment procedure is to provide the states with a means for informing sport and subsistence anglers about the health risks associated with contaminated fish they catch from local waters (USEPA, 1989). These methods generally use estimated increased cancer risks associated with specified amounts of contaminated fish consumption to link human health risks to fish consumption. Using advisories based on this information, an angler can decide how much fish to eat for a specified probable increase in cancer risk (USEPA, 1989). The EPA approach for fish consumption advisories gives full priority to public health protection.

The formula $P = X(Q1^*)$, represents the increased lifetime cancer risk (P) caused by exposure to a daily dose (X) of carcinogen with a potency factor (Q1*) for 70 years (Reinert *et al.*, 1991). This information, coupled with meal size and body weight, can be used to calculate the EPA-derived number of meals that can be safely consumed over a given period of time. However, states tend to use different average body sizes, some including a body weight for children. This often results in different risk estimates, sometimes for the same body of water, leading to confusion among anglers and other consumers. Values for the maximum acceptable cancer risk also varies state to state (Cunningham *et al.*, 1994). This value is usually expressed as an estimate of the number of additional human cases of cancer

that would be acceptable in a given population. In Connecticut, an acceptable risk level of 1×10^{-6} means one additional cancer in a population of one million.

The risk assessment process is not without debate. Concerns have been expressed about the traditional laboratory testing procedures involving high doses of carcinogens on animals, and how they relate to the much lower actual exposure of humans. However, all factions do agree that lowering the dose decreases the risk. The EPA's present stand is conservative: it assumes that any detectable level of a carcinogen has the potential for inducing cancer. Another conservative assumption the EPA makes in this risk assessment process is that humans consume contaminated fish for 70 years at a constant dose. (USEPA, 1989). Yet, many of these chemical carcinogens have only been in existence 30-50 years, and regulatory actions over the last 20 years have resulted in diminished concentrations in aquatic systems. These risk assessment models do not take into consideration fish preparation or cooking methods, which, when employed, have been shown to significantly reduce organic contaminant levels in some fish species (Sanders & Haynes, 1988; Armbruster *et al.*, 1989; Gall & Voiland, 1990; Duttweiler, 1978).

II. Statement of Problem and Hypotheses

Consumption rate is a key factor in the calculation of risk assessment and determining a course of risk management. When CTDEP adopted their water quality standards in 1992, they included human health criteria for the consumption of contaminated fish, based on the EPA-recommended consumption rate of 6.5 g/person/day. At the same time, CTDEP made a commitment to state environmental groups that they would attempt to quantify fish and seafood consumption levels for Connecticut, particularly among groups at special or higher risk to exposure to toxic contaminants in fish and seafood. These groups included pregnant women, anglers, commercial fishermen, and subsistence/cultural fishermen. As a coastal state with greater access to fish and seafood, it is important to determine if the consumption rates of the general Connecticut population and the higher-risk populations are significantly greater than the national average. If they are, then a pertinent quantified consumption rate for use in these calculations must be identified.

To help assess whether the State's adopted water quality criteria are effectively minimizing the risk of human exposure to chemical toxins in Long Island Sound fish and seafood, the following questions needed answers:

- What is the average daily consumption rate of Long Island Sound fish and shellfish in Connecticut?
- What is the average daily consumption rate of fish and seafood in Connecticut from all sources (recreational and commercial, freshwater and saltwater)?
- How do these rates compare to the national average of 6.5 g/day used in water quality standard calculations?
- What are the average daily consumption rates of Long Island Sound fish and shellfish by groups considered to be at higher risk for exposure to toxic contaminants: anglers and their families, subsistence/cultural fishermen and their families, commercial fishing families, women of childbearing age, and young children?
- What are the sources and species of fish and shellfish consumed in Connecticut?
- Are steps being taken in the preparation of fish or shellfish that help minimize the risk of exposure to contaminants?

These questions were then used to develop objectives and hypotheses for the project.

A. Study Objectives

1. To document the species and sources of fish and shellfish consumed by:
 - a. General population of Connecticut
 - b. Women of childbearing age (ages >15 and ≤45)
 - c. Children ages ≤15
 - d. Sport fishing families
 - e. Commercial fishing families
 - f. Limited income families
 - g. Minority families, including Southeast Asians
2. To quantify the frequency of fish and seafood consumption (mean number of meals per year), and average meal size per time, as well as seasonal changes in consumption patterns.
3. To quantify the average consumption (grams/person/day) for the populations listed in (1).
4. To document the types of preparation and cooking methods used for fish and shellfish, including the parts of the fish that are eaten and whether fish are trimmed of skin and fat before they are cooked.
5. To assess the level of awareness of and compliance with state-issued fish consumption advisories.
6. To provide household and individual seafood consumer demographic information for Connecticut.
7. To determine the availability of seafood harvested in Long Island Sound in local markets and restaurants.

B. Hypotheses

- H_{01} : *The average total consumption rate of fish and seafood by the general Connecticut population is less than or equal to the national average, defined by the US EPA (1980) as 6.5 g/person/day*.*
- H_{A1} : *The average total consumption rate of fish and seafood by Connecticut citizens is greater than the national average, as defined by the US EPA (1980)*.*
- H_{02} : *The average total consumption rates of fish and seafood by high-risk groups in Connecticut are each less than or equal to 6.5 g/day*.*
- H_{A2} : *The average total consumption rates of fish and seafood by high-risk groups in Connecticut are each greater than 6.5 g/day*.*

*This study's investigators were unable to determine the exact origin of the 6.5 grams/day consumption rate commonly used in these risk assessment calculations. West *et al.* (1993) describes their effort to determine the origin of this number in a footnote to Chapter 1 of their report. The 6.5 gm/day was thought to come from a study conducted by SRI International study for the EPA in 1980. They examined the SRI study (Javitz, 1980), which was actually a review of several studies, but did not find it

to be the source of the 6.5 g/day. The SRI study concluded that the “most reliable source of data on human fish consumption appears to be the survey conducted during 1973 and 1974 by National Purchase Dairy Research Inc.” (Javitz, 1980; West *et al.*, 1993). The NPD study data was re-analyzed by Cordle *et al.* in 1978, who reported mean consumption as 18.7 g/day of fish for the average U.S. citizen. Noting errors in the data, SRI re-analyzed a clean database of the NPD survey obtained from the EPA, and concluded that the mean consumption rate was 14.3 g/day per capita, with a 95th percentile of 41.7 g/day (West *et al.*, 1993; Javitz, 1980). Following up further, West *et al.* (1993) spoke with Skip Houseknecht, EPA’s top expert on fish consumption, who thought that the 6.5 g/day figure had derived from the 1973-74 National Purchase Dairy (NPD) study, but that the study and its data had been “destroyed.” Efforts to replicate the 6.5 g/day rate have been unsuccessful, and as a result, draws into question one of the primary criteria used to develop water quality standards nationwide. *Based on these findings, the more conservative rate of 14.3 g/day was used as the cutoff for the hypotheses, rather than 6.5 g/day.*

III. Methods

A. Survey Tools

1. Review of Options

A number of survey tools were considered for this study, based on those used in similar seafood consumption studies (Peters and Houseknecht, 1992; Weinstein and Bisongni, 1995; West *et al.*, 1993).

Twenty-four hour recall surveys are commonly used in dietary studies, but because many people are infrequent consumers of fish or seafood, it was concluded that a 24-hour recall would result in a significant underestimation of actual consumption patterns, even if conducted several times per year.

Food records are also used for intake studies, typically self-administered for one, three or seven days. While reasonably accurate, food records are time-consuming to fill out, so they often contribute to smaller sample sizes. Block (1982) found food records to be impractical, demanding a high degree of cooperation. Accuracy, while sufficient early on, may falter as the respondent tires of the process. Because they focus on a single time period, a single record may not be able to address the seasonality of consumption patterns. This study attempted to include a 10-day food record as a component of the survey tool. However, data from these records are not included in the results of this study for several reasons. Relatively few were returned, and the accuracy of some were suspect. Some were incomplete, others indicated that respondents appeared to eat more seafood than usual (when compared with other components of the survey) during the time they were recording intakes.

The food frequency questionnaire, a recall tool commonly used in dietary and nutritional studies, was chosen as the best way to collect the seafood consumption data for this study. A food frequency assesses the “usual intake” (types of food eaten, typical portion size, frequency of consumption in number of portions per day, week, month or year) rather than actual intake for a specific time period. This technique appears to be highly successful for estimating the usual intake of a population (Mullen *et al.*, 1984; Russell-Briefel *et al.*, 1985), rather than the accurate intake of an individual. Mullen *et al.* (1984) also found that foods that are often the major components of a meal and eaten in large quantities were

better estimated in food frequencies than foods used in smaller quantities. This concept could apply to seafood, usually a component of a meal's main dish.

Studies have shown that individuals completing a food frequency successfully estimated their intake, when compared to more extensive diet histories or indirect observations of food intake (Block, 1982; Mullen, 1984). Food frequencies can overestimate consumption on an individual basis, particularly when considering commonly eaten food groups (Block, 1982). Elmstahn *et al.* (1966) found that individuals completing a food frequency overestimated the intake of most food groups by 22% as compared to a reference of six 3-day food records, with men over-reporting more than women. Other studies have shown individual overestimates ranging from 10-20%, however Russell-Briefel *et al.* (1985) found that intra-individual variance was less than other methods because a food frequency covers the longest time period. As we were interested in the seafood consumption of specific populations rather than individuals, we decided that the food frequency, combined with food portion visuals would be the appropriate tool for this study.

2. Portion Size Determination

The ability of an individual to estimate portion sizes accurately was critical to the success of this study. During the pilot study, illustrations of quantities of seafood shown on a plate—developed for the NMFS seafood consumption model (NFI, 1994)—were used. These pictures were found to be unsatisfactory for two reasons: it was difficult to assign a gram-weight to the pictures to quantify portion sizes, and study participants seemed to have a difficult time finding a picture that matched the portion they consumed.

The Nutrition Consulting Enterprises (NCE) 2D Food Portion Visual (Millen and Morgan, 1996) was originally validated in 1982 for use with older individuals as part of a national evaluation of the federally-funded Food Stamp Program, to meet researchers' needs for an accurate and reliable method to assess dietary intake. It was subsequently validated for use with adult men and women as part of the Framingham Heart Study, and is currently being widely used as a complementary tool for 24 hour recalls,

food records, food frequency questionnaires, and diet histories (Mullen and Morgan, 1996). These visuals (Appendix 4) enable survey participants to describe their edible food portions based on common shapes and thicknesses, illustrated on a two-sided chart. The A-side of the chart provides shapes for estimating portions of foods typically measured in volume (condiments, beverages, “mounds” on a plate, wedges, etc.) The B-side of the chart provides discs, squares, rectangles and two thickness measures, typically used to estimate edible portions of meats, fish and cheese. Portions described using these chart diagrams were convertible to ounces and grams, and, with minimal explanation, appeared to be less difficult to use than the NFI illustrations.

3. Survey Tool for This Study

The final survey tool for this study was composed of several parts. The **food frequency** (Appendix 2) included entries for the type of fish/seafood eaten, the frequency of consumption (daily, weekly, monthly, annually), the season when it is eaten, the portion size, the parts eaten, and source. Examples were provided to guide the respondent to complete the form properly. Ten species that can be caught in Long Island Sound (identified by the CT DEP as key species of interest), as well as three other commonly eaten types of seafood (tuna, frozen fish sticks, and imitation crab meat or surimi). Space was provided for the respondent to list other types of seafood consumed. The food frequency was also translated and made available in Spanish and Vietnamese (Appendix 3). A **list of common freshwater and saltwater fish, shellfish, crustaceans and prepared seafood** were listed on the form to help jog memories (Appendix 4), and a copy of the **NCE food portion visual** was enclosed (Appendix 5).

A **food record** or diary was provided so that participants could record fish and seafood meals consumed both at home and away from home over a ten-day period, as well as document where the fish/seafood was obtained and how it was prepared (Appendix 6). The ten-day timeframe was chosen because the investigators felt that a seven-day diary might not adequately reflect seafood consumption patterns, while a 14-day diary was too burdensome for survey participants (based on pilot study results). (This ten-day food record was not included in the final analysis for reasons described later on.)

For each participant and household in the study, **basic demographic information** was collected (Appendix 7). Household information includes primary race, primary language, highest education level, income level, and several questions about the fish consumption advisories issued by the State of Connecticut. Individual history information requested for each member of the household included age, weight, height, frequency of eating seafood overall, fishing activity and, if they fish, where and how often. Females were also asked if they were pregnant or lactating.

The survey package also included:

- A cover letter briefly explaining the survey and providing contact numbers
- A offer of a \$5.00 gift certificate to a major local supermarket as an incentive to complete and return the survey materials
- A postage-paid envelope, coded with a return address and code number for each household, to facilitate additional contact with that household, if needed

This package was used for all of the populations, either via mail or in-person interview. The same questions were used during interviews with Southeast Asian household members, but they were presented in a different format (Appendix 8).

4. Follow-up

A follow-up telephone call to encourage participation and answer questions was made 7-10 days after each mailing to improve response rates. The telephone call was followed by one postcard reminder mailed two weeks after the initial mailing (Appendix 9). About halfway into the study, the telephone call was eliminated because it was determined to be ineffective and a poor use of limited staff time. To improve the effectiveness and quality of the returned surveys, trained nutrition students made follow-up telephone calls to each household, to fill in missing information or clarify the answers provided.

B. Pilot Study

A pilot run of the first draft of the survey tool was conducted during the spring 1996. The survey package (Appendix 10) was mailed to 50 households randomly selected from a complete state set of telephone books. The pilot survey consisted of a two-week diary, and individual and household questions. Pictures of seafood portions were provided (NFI, 1994) to help estimate individual serving size. The

households were divided into two groups of 25 each, Group A and Group B. Group A was designated to receive a follow-up telephone call to answer any questions and to encourage participation in the study. Group B was not contacted.

Two attempts were made to contact each household in Group A; 20 were reached. An attempt was made to collect some information via the telephone to determine if this would be a feasible method, but it became quickly apparent this took too much time. Of the 20 in Group A that received a follow-up telephone call, three returned completed surveys. Of the 30 households who were not reached by telephone, one returned an incomplete survey.

1. Changes Resulting From Pilot Study

Based on these results, a number of revisions were made to the survey tool. The format was changed to include the food frequency questionnaire. The NCE Food Portion Visuals were substituted for the pictures of fish and seafood. While recognizing that a tremendous amount of information was needed in order to provide a quantitative grams/person/day consumption value, every effort was made to simplify the questions and the format.

C. Study Populations and Sample Size

All sample size calculations are for a one-sided test with power of at least 95%. Various specified differences and variances were calculated. Since this study is concerned with setting water quality standards, the question that needs to be answered when calculating sample size is: what is the amount of fish one would need to consume (above the 14.3 g/day average) that would be considered unacceptable? To answer this question, we considered various minimum detectable differences above 14.3 g/day of 5% and 7%. From the literature, population variances ranged from 0.5 to 0.8. We determined sample sizes for $\alpha(1)=.05$ with power of 90% and 95% at various deltas (minimal detectable differences) and variances. Sample sizes for specific populations are listed in Table 2. (We used 6.5 g/day in the sample size calculations, but later decided to use 14.3 g/day as the cutoff for the hypotheses, since we couldn't verify the rate of 6.5 g/day. Since the sample size calculations were based on detecting a 5% or 7% difference

between the population mean of 6.5 g/day and the sample means at 90% or 95% power, they are adequate to detect the same 5% - 7% difference between the population mean of 14.3 g/day and the sample means.)

Sample sizes were calculated based on these criteria, with a projected return rate of 15% for the general population mail surveys due to the length of the survey package. All members of a household were sampled. Unlike the general population, the high-risk populations were sampled directly and disproportionately, since a random sample would have been unlikely to result in adequate sample sizes for these rarer and underrepresented populations.

Table 2. Sample sizes required for specific populations, using variances (σ^2) obtained from the literature, for two conservative minimum detectable differences, and at power of 90% and 95%.

Population	σ^2	Power			
		90%		95%	
		$\Delta = .325$ (5%)	$\Delta = .455$ (7%)	$\Delta = .325$ (5%)	$\Delta = .455$ (7%)
General Population	.7	338	175	557	290
	.75	387	201	640	333
	.8	440	229	728	379
Adults (New England)	.65	290	151	480	250
Children (New England)	.7	338	175	557	290
Blacks	.65	290	151	480	250
Asians	.7	338	175	557	290
Sport Fishermen	.55	208	108	344	179
Women (16-44)	---	---	---	---	---

1. General Population

a. Sample Size Methodology

Any person residing in the state of Connecticut was considered part of the general population pool for the purposes of this study. According to 1990 census data, there were 1,230,243 households in Connecticut, with an average number of 2.59 people. Assuming a low 15% return rate by mail for useable surveys, it was calculated that a pool of 4,000 household names, divided up proportionally by county and town according to population, would result in an adequate sample size.

Random digit dialing was considered as a means for reaching households and administering the food frequency. However, the amount and type of information needed would require prior contact by mail, to familiarize the respondent with both the questions and to provide portion visuals. In essence, two telephone calls would have been required, one to get an address, and another to follow up on the data collection, in addition to a mailing. The anticipated long length of the telephone calls would have been too burdensome on both study participants and staff. This sentiment was reinforced during the pilot phase of the project, when it became readily apparent that individuals were reluctant to take the time to answer all of the questions for each household member over the telephone.

After reviewing several options, a database of households current to 1996 was purchased from Database America of Montvale, New Jersey. The company's database from which the households were chosen contained both residences with phones (count=927,373) and those without phone service (count=78,519), with a total count of households = 1,005,892. Database America was directed to generate randomly specific number of households for each county, as calculated in Table 3, for a total pool of 4,000 households. This company was unable to generate a random list utilizing specific zip codes, but assured that the county households would be chosen randomly from all towns within a county. The Database America county household calculations are compared with those calculated from 1990 census data in Table 3 also.

The company guaranteed that 98% of their addresses were telephone-verified or doubly-verified, as well as matched against the U.S. Postal Service's National Change of Address file. In addition, they guaranteed their mailing list to be 93% deliverable within 60 days. (As this study lasted for the better part of a year, that accuracy period was exceeded, and the number of undeliverable surveys did increase over the period of the study.)

Using Database America's 1996 household data for Connecticut—which provided the number of households in each of the eight counties in their database, the counties were weighted by percent of the total number of households (1,005,892) in the Connecticut database. The appropriate number of

households needed was then calculated, for a total mailing to 4,000 households. A comparison of the same calculations using the 1990 census data showed no significant difference in the mailing regimen.

Based on a projected year of mailings to 4,000 households, the number of survey packages mailed totaled 77 weekly. When the database arrived, the households were coded by county and divided into individual county databases. Each county database was sorted by zip code, and the households were assigned a code number as an identifier, and a week number. For example, Fairfield County had 1,014 households, and 19 households were scheduled to receive a mailing each week during the study year.

b. Study Sample Population

The mail survey for the general, commercial fishing and sport fishing populations began July 8, 1996 and continued for 45 weeks, until May 2, 1997. The mail survey was shortened from the projected 52 weeks because adequate sample sizes had been achieved.

Due to a short delay in receiving the randomized database from Database America, Inc., the general population mail survey began August 20, 1996, and ran for 39 weeks through May 2, 1997. The total number of surveys mailed weekly was increased by 11-12, proportionately by county, to account for the missing first six weeks. Of the 3,384 surveys mailed, 297 were undeliverable (no forwarding address available). Any returns with the correct new address provided were re-mailed. The surveys returned covered 216 households and 460 individuals, a 7.0% return rate. The number of returned surveys with complete food frequencies was 207 households and 434 individuals. Despite the low return rate, this sample size was sufficient to meet the criteria set ($\alpha = .05$, $1-\beta = .90$, for a minimum detectable difference of 5-7% from 14.3 g/day).

The breakdown of the fully completed returns by county closely matched the household breakdown from the 1990 census (Table 4), achieving the goal of a population distribution representative of the state.

Table 3. Comparison of Database America household database to 1990 household census data by county. The number of surveys to be mailed weekly was weighted according to the percent of the total households occurring in each county.

County	No. of Households		Percent of Total CT Households		No. of Households included in mail Survey of 4,000		No. of Surveys to be mailed weekly by county	
	Database America	1990 Census	Database America	1990 Census	Database America	1990 Census	Database America	1990 Census
Litchfield	59,761	66,327	.0594	.0539	238	216	5	4
Fairfield	255,093	305,167	.2536	.2481	1,014	992	19	19
Hartford	251,048	324,646	.2496	.2639	998	1,055	19	20
New Haven	240,040	304,169	.2386	.2472	955	989	18	19
Tolland	37,505	44,218	.0373	.0359	149	144	3	3
Middlesex	51,767	54,694	.0515	.0445	206	178	4	4
Windham	29,890	37,480	.0297	.0305	119	122	3	2
New London	80,788	93,542	.0803	.0760	321	304	6	6
TOTAL	1,005,892	1,230,243	1.000	1.000	4,000	4,000	77	77

Table 4. Percent of fully completed household survey returns by county for the study, compared to 1990 census data.

County	Percent of Households	
	1990 Census	Study
Litchfield	5.39	8.21
Fairfield	24.81	21.26
Hartford	26.39	26.09
New haven	24.72	24.15
Tolland	3.59	0.97
Middlesex	4.45	7.25
Windham	3.05	3.38
New London	7.60	8.70

2. Commercial Fishing Families

a. Sample Size Methodology

Commercial fishing families were reached using the 1996 database of permit license holders provided by the DEP, Bureau of Marine Fisheries. This database included 10-pot license holders for lobster. All

nonresidents and duplicate permit holders were removed from the database, leaving a pool of 1,796 individuals.

The database was sorted alphabetically by household name, and assigned an identification code and a week number. Of the 34 households numbered for each week, 15 were randomly chosen and mailed the survey package, based on an anticipated return rate of 10%.

b. Study Sample Population

The commercial fishing mail survey was conducted from July 22, 1996 through May 2, 1997, a total of 43 weeks. Of the 656 survey packages mailed, only three were undeliverable. Seventy-six households returned the surveys, covering 190 individuals, an 11.6% return rate. Of those returned, information for 73 households and 178 individuals was complete. This sample size was too small to meet the power condition of the test that was set *a priori*, falling instead to less than 75% power.

3. Sport Fishing and Cultural/Subsistence Fishing Families

a. Sample Size Methodology

The sport fishing population includes saltwater and freshwater anglers, cultural fishing families (primarily Southeast Asian households), and subsistence fishing families (limited income fishing households). This study was primarily funded to quantify consumption of seafood from Long Island Sound, therefore marine anglers were one of the focused sampling efforts. A database of names and addresses had to be generated through field interviews of saltwater anglers, since there is no saltwater license requirement in Connecticut. Freshwater anglers were not sampled directly. Cultural and subsistence fishing families were sampled as part of the Southeast Asian and limited income sampling efforts.

A randomized, representative sample of saltwater anglers, including shored-based anglers, private vessel anglers, and charter/party boat anglers was compiled by field interviewers (Appendix 11). The database was alphabetized by last name, and assigned an identifier code and a week mailing code in the

same manner as the general population and commercial fishing households. From this database, ten mailings a week were sent to marine anglers.

The field effort to collect angler names and addresses was amended within a few weeks to include complete interviews with the angler in the field whenever possible. A “complete” interview involved collecting household and individual demographics and a food frequency for the angler. A copy of the partially completed survey was mailed during the assigned week for other household members to complete.

b. Study Sample Population

The marine sport fishing survey ran for 43 weeks, from July 8, 1996 through May 2, 1997, with a shortage of addresses preventing mailings the week of July 22, 1996 and August 5, 1996. Overall, 397 survey packages mailed, of which 15 were undeliverable. Fifty were returned for a 13.1 % return rate. Complete interviews with fishermen in the field, coupled with the “capture” of other sport fishing families in the general population, limited income and minority population samples, brought the total number of households to 348, covering 514 individuals. Of these, the information for 341 households and 504 individuals was complete, including 267 men ages 16 –65 years. This sample size was adequate to meet the test conditions set.

4. Minority and Limited Income Families

Three approaches were taken to reach these populations, using personal interviews rather than mail surveys. As “rarer” populations, a randomized sampling approach would have most likely resulted in undersampling. Instead, a non-random, directed, convenience sampling approach was used.

a. Southeast Asian Communities

The first approach focused on the Southeast Asian communities of Vietnamese, Laotian, Cambodian and Hmong, a group identified by the CTDPH as one of primary concern. This particular sub-population can be difficult to survey, because Asians tend to remain closely tied to their culture, have a lack of trust of outsiders, and are a very private people. Language is also a barrier.

1. Sample Size Methodology

Mai Nguyen, a Vietnamese woman, was hired to make the necessary contacts with Southeast Asian families and conduct interviews in person. Her typical and necessary approach was to make contact with someone in a church or agency within or working with a Southeast Asian community, and obtain a formal introduction to families through that church or agency. Often, it took several contacts, a lot of patience, and even a sharing of a meal, before the trust and comfort level was such that the household members would agree to answer the survey questions posed.

Even with slowly established trust, some questions were evaded, particularly those regarding fishing activities and fishing locations. Ms. Nguyen felt that a number of families would not provide this information for fear of being reported to the state for fishing without the proper license, despite her reassurances to the contrary.

Ms. Nguyen was encouraged to make contact with a variety of Asian cultures (Vietnamese, Laotian, Cambodian, Hmong, Chinese, Korean), as well as to visit Connecticut communities with a greater percentage of Asian families (Hartford, West Hartford, Danbury, Bristol, and Bridgeport). Sampling was non-probability rather than random, dependent on whose trust could be gained, and who was willing to answer the questions. The same information was collected as the mail survey, but in a slightly different format. Information on food preparation was also collected.

2. Study Sample Population

Ms. Nguyen was able to make contact and conduct interviews with 89 Southeast Asian households, representing 329 individuals. Of these households, 73 were Vietnamese, seven were Laotian, five were Cambodian, and four were Hmong (representing ~35% of the 1990 census Hmong population). This sample population met the sample size criteria.

a. Non-Southeast Asian Minorities

The other two approaches involved conducting interviews with clients of federally funded aid programs for limited income and minority households.

1. Sample Size Methodology

Members of low income and/or minority households, women of childbearing age and young children in particular, were identified through the USDA-supported Women, Infants and Children (WIC) clinics. WIC clinics provide supplemental nutrition to low-income women who are pregnant or have young children. Three nutritional science students conducted interviews at WIC clinics in Hartford, Norwich, New Haven, Bridgeport, Waterbury, New Britain, Middletown, Vernon, Plainfield, Danbury and Torrington, with women either referred to them, or who were in the waiting room and willing to participate in the study. Before any interviews took place, participants were asked to sign a consent form. Interviews were conducted in English or Spanish, as needed. This was not an optimal setting for data collection.

The final means for securing interviews with limited income and minority households was through the University of Connecticut Expanded Food and Nutrition Education Program (EFNEP), which is administered by the Cooperative Extension System. Several EFNEP staff administered the food frequency to clients willing to participate in the study.

2. Study Sample Population

All non-white households identified during this survey were included in the minority population. This population was also broken down into two subsets: Southeast Asian minority families (Vietnamese, Cambodian, Laotian, Hmong), and non-Southeast Asian minority families. In total, 245 minority households were interviewed, representing 860 individuals. Non-Southeast Asian minorities totalled 156 households and 531 individuals, including 63 non-Hispanic Black households, 33 Puerto Rican households, 16 Korean households, and 11 Hispanic households. The total minority sample population met the sample size criteria, as did the Southeast Asian and non-Southeast Asian minority subsets. Sample sizes of Black, Puerto Rican, and Hispanic households were too small to individually meet the sample size criteria.

b. Limited Income Population

1. Sample Size Methodology

The limited income sample population was derived from all households participating in this study, based on household size (number of people in residence) and household income level. Eligibility information provided by the Connecticut Department of Social Services (May 1998, personal communication) and the WIC program in Connecticut (June 1998, personal communication) were used to develop a scale, adjusted down slightly to better reflect 1996-97 income levels (Appendix 12).

2. Study Sample Population

Due to the large number of limited income households interviewed through the WIC and EFNEP programs, about 1/3 of the total study population is included in this sample population of 276 households and 937 individuals. Sample size criteria were met for this population.

5. Women of Childbearing Age and Children Populations

a. Sample Size Methodology

The women of childbearing age (>15 and ≤ 45) and children (≤ 15) populations were drawn from all of the individuals included in the study, using birthdates to calculate age as of January 1, 1997.

b. Study Sample Populations

From the total population of this study, 493 women from 420 households were included in the potential childbearing population, encompassing ages >15 and ≤ 45 years of age. For the children ≤ 15 years of age sample population, 559 children from 305 households were identified. These sample population sizes met the established sample size criteria.

It is important to emphasize that the nine populations used in this study are not mutually exclusive. Depending on age, gender, race, fishing activity and income status, a substantial percentage of the 2,354 individuals (1,048 households) in the overall study are included in more than one population. Based on the scope of this study, it would have been far too costly and time-consuming to attempt to

develop nine independent populations. For this reason, no statistical comparisons have been made between the nine populations.

D. Survey of Seafood Sources

One of the objectives of this project was to determine the amount of seafood from Long Island Sound that is sold and served in Connecticut. Two short surveys were mailed to try to answer this question. The first (Appendix 13) was mailed to a randomly chosen subset of 225 harvesters of finfish, shellfish and lobsters licensed by Connecticut DEP and the Connecticut Department of Agriculture, Bureau of Aquaculture. The questions focused on species harvested and sold, to whom they were sold, the percentage of the total harvest by species sold in Connecticut, and the quantity. The second survey (Appendix 14) was randomly mailed to 225 seafood retailers, distributors, and restaurants in Connecticut. The questions focused on the whether the source of the seafood served was known, and the species and amount of seafood harvested in Connecticut waters that was purchased to sell or serve in Connecticut.

E. Data Entry and Manipulation

All data were entered into EpiInfo 6.1. The study populations were designated (general , commercial fishing, sport fishing, limited income, minority (with Southeast Asian and non-Southeast Asian minority subsets), women of childbearing age and children ages 15 and younger. (These populations are not mutually exclusive.) Each household was assigned a code, indicating whether or not the food frequency questions were completed for household members. While the food record data were entered, no analysis was completed, due to low sample sizes and some suspect responses.

1. Conversion of Portions to Cooked, Edible Weight Basis

The fish and seafood portions eaten by an individual were indicated on the food frequency in one of four ways: referencing the “A” side of the food portion visual chart, referencing the “B” side of the food portion visual chart, provided as numbers of individual pieces (e.g. six stuffed clams or one dozen crabs), or in pounds/ounces (e.g. one pound of crabmeat). The latter two portion size identification methods were independent of the food portion visuals, and referred to as “no sides”. All portions were converted to

ounces of **cooked, edible meat weight**, with exception of shellfish eaten raw (Appendix 15). The weight of all “refuse” (shells, bones, head, skin, etc.), non-fish ingredients such as breading, and water (lost during cooking process) was removed during the calculations, using conversions available (USDA, 1987). The Minnesota Nutrition Data Systems (NDS93, Version 2.9) was used to calculate the ounces from the portion sizes given, correcting for density by species (Arneson, 1988; Schakel *et al.*, 1988).

2. Whole Fish Reductions

Occasionally, the portions provided appeared to be for a whole fish, of which only the meat was eaten. If this could not be verified by phone, the edible weight of the fish prior to cooking was reduced to 40% of the weight given, to account for refuse lost during the filleting process (MacLeod, personal communication). Even with these corrections, there were still some very large portion sizes, which are questionable.

IV. Results

A. Population Demographics

Nine populations make up this study: general population, sport fishing, commercial fishing, minorities, limited income, women, children, Southeast Asians and non-Southeast Asian minorities. It is important to note that these *populations are not mutually exclusive*; depending on gender, age, race, income status, and fishing activity, some individuals appear in more than one population.

The general population was derived from a mail survey. The sport fishing population was derived by locating fishermen at coastal locations, as well as including any non-commercial fishing household identified through other interviews or mail surveys. The commercial fishing population contains households where one member holds a DEP-issued commercial fishing permit. The minority population includes any non-Caucasian households identified through interviews at WIC clinics, through the EFNEP program, interviews with Southeast Asians, or mail surveys. The limited income population includes any household which, based on household size and income levels, fell within the criteria listed in Appendix 12. Any woman falling into the age category of >15 and ≤ 45 years was included in the women population, and any child falling in the age category of ≤ 15 years was included in the children population. Most Southeast Asians were identified through an interview process, although some additional households were identified through the mail survey. All minorities other than Vietnamese, Cambodian, Laotian and Hmong were included in the non-Southeast Asian minority population. (For more information on the populations, see Methods section.)

The information for households returning a survey package with a *complete food frequency* or for *non-seafood eating households* is found in Table 5. There were 811 different households and 2,084 individuals represented in this part of the study (those returning complete survey packages). Household information includes number of household members, county of residence, primary race, primary language used, highest education level of household head, income level, and whether or not the household received food stamps to supplement its income.

Average household size varied from 1.5 (sport fishing) to 2.1 (general) to 2.4 (commercial fishing) to 3.4 (limited) and 3.5 (minority) persons, with an overall range of 1 to 9 persons. General population households tended to be smaller (72.5% with 1-2 people; 4.8% with 5 or more people) compared to minority and limited income families, where 22.0% and 24.6% of the households had 5 or more people, respectively (Table 5).

The three most populated counties, Hartford, Fairfield and New Haven, were represented by the most households, while Tolland and Windham counties were represented by the fewest, mirroring the population distribution in Connecticut. The majority of households were white (91% of general population; 75% of sport fishing population; 99% of commercial fishing population; and 49% of limited income households), however 15 minority races are also represented by the data, including non-Hispanic Blacks, Vietnamese, Puerto Ricans, Hispanics, Koreans and Chinese, in percentages that meet or exceed the 1990 Census breakdown (Table 5).

The majority of the individuals included in the Southeast Asian minority subset are Vietnamese, because the interviewer was Vietnamese. Cultural and language barriers impeded conversations with many Laotian, Cambodian, and Hmong families. There were not enough non-Hispanic Blacks and Hispanics interviewed to make separate subsets, so all other “non-Southeast Asian” minorities are examined as one subset of the total minority population.

Primary household language was English, followed by Vietnamese, Spanish and Korean (Table 5). Highest education level achieved by the head(s) of the household ranged from some elementary or middle school to post-graduate degrees, with a greater proportion of limited and minority households falling into the lower education levels. Household income was broadly distributed from the lowest range of \$0 – 4,999 to the highest range of \geq \$70,000. More than one-third of the limited income households received food stamps, somewhat lower than expected. Because of the way we focused on limited income families by interviewing WIC participants, more than 25% of the children included in the population were from

households receiving food stamps. Twenty-five percent and 28% of the non-Southeast Asian minority households and the Southeast Asian minority households receive food stamp assistance.

Individual demographic information by population is provided in Table 6. The genders are evenly split, with the exception of the sport fishing population, which represents a predominance of males due to the interviews conducted in the field, the majority of which were with men. Slightly more females (56%) than males (44%) comprise the non-Southeast Asian minority subset, and 40% of this population are children less than 15 years of age. This reflects the disproportionate sampling of women at the WIC centers. The populations were divided into age/gender categories: children ≤ 15 years, women >15 and ≤ 45 to represent childbearing age, women >45 and ≤ 65 , men >15 and ≤ 65 , and adults >65 . Fifty-one pregnant women, and 22 lactating women were captured for all populations. Thirteen percent ($n=20$) of the non-Southeast Asian minority subset were pregnant and 5% ($n=8$) lactating (Table 6).

In each population, the vast majority of individuals consume at least one type of fish or seafood. One hundred percent of the Southeast Asians interviewed and 97% of the sport fishing and commercial fishing family members ate fish and seafood. Eighty-four percent of the non-Southeast Asian minority population subset ate seafood. The number of non-seafood eaters ranged from 2-3% (sport fishing and commercial fishing households) to 10.8% (general population) to 14% (limited income households). Close to 25% of the children did not eat seafood. In looking at the make-up of the non-seafood eaters, 65.6% were children, 12.1% were men ages >15 and ≤ 65 , 14.9% were women in the childbearing age category, 5.6% were women >45 and ≤ 65 , and 1.9% were adults >65 (Table 6).

B. Species Consumed and Seafood/ Fish Sources

The food frequency listed ten target species harvested in Long Island Sound, along with three other commonly-eaten seafoods. Additional space was provided for individuals to fill in the other types of

Table 5. Breakdown of household demographic responses by population, for all survey returns with complete food frequency information or households that do not eat seafood. Data includes two subsets of minority population, Southeast Asians and non-Southeast Asian minorities. Populations are not mutually exclusive.

Variable	General Population		Sport Fishing Families		Commercial Fishing Families		Minority Families		Limited Income Families		Women >15 and ≤ 45		Children ≤ 15		Southeast Asian Families		Non-SE Asian Minority Families	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Total Households		207		341		73		245		276		420		305		89		156
Total Individuals		434		504		178		860		937		493		559		329		531
Household Size		207		341		73		245		276		420		305		89		156
1 person	34.78	72	11.44	39	13.70	10	6.53	16	10.87	30	5.00	21	—	—	6.74	6	6.41	10
2 people	37.68	78	26.98	92	49.32	36	14.29	35	16.67	46	18.33	77	8.20	25	14.61	13	14.10	22
3 people	13.04	27	20.53	70	17.81	13	28.98	71	23.55	65	27.86	117	30.49	93	25.84	23	30.77	48
4 people	9.66	20	25.51	87	13.70	10	28.16	69	24.28	67	27.62	116	34.43	105	25.84	23	29.49	46
5 people	4.35	9	9.97	34	4.11	3	10.61	26	12.32	34	13.10	55	16.72	51	7.87	7	12.18	19
6–9 people	0.48	1	5.87	20	1.41	1	11.43	28	12.32	34	8.10	34	8.85	27	19.1	17	7.05	11
County of Residence		207		340		73		245		275		419		300		89		156
Fairfield	21.26	44	23.24	79	13.70	10	21.63	53	16.73	46	17.42	73	18.00	54	23.60	21	20.51	32
Hartford	26.09	54	22.06	75	17.81	13	53.47	131	41.82	115	38.42	161	35.33	106	68.54	61	44.87	70
Litchfield	8.21	17	5.59	19	—	—	0.82	2	9.82	27	9.07	38	11.67	35	—	—	1.28	2
Middlesex	7.25	15	7.35	25	15.07	11	0.82	2	1.82	5	13.58	15	3.33	10	0.01	1	0.64	1
New Haven	24.15	50	24.41	83	17.81	13	20.00	49	18.91	52	22.43	94	21.33	64	0.01	1	30.77	48
New London	8.70	18	5.29	18	34.25	25	0.82	2	2.55	7	3.82	16	4.33	13	0.01	1	1.28	1
Tolland	0.97	2	1.76	6	—	—	1.63	4	0.73	2	1.67	7	2.00	6	0.04	4	—	—
Windham	3.38	7	2.65	9	1.37	1	0.41	1	6.55	18	3.10	13	3.00	9	—	—	0.64	1
Race (Household)		207		341		178		245		275		420		305		89		156
White, non-Hispanic	90.82	188	75.37	257	98.88	176	—	—	49.45	136	51.90	218	53.44	163	—	—	—	—
Black, non-Hispanic	1.45	3	4.11	14	—	—	25.71	63	10.40	39	13.10	55	15.08	46	—	—	40.38	63
Chinese	1.45	3	0.59	2	—	—	3.67	9	0.73	2	1.67	7	1.64	5	—	—	5.77	9
Korean	0.48	1	0.29	1	—	—	6.53	16	1.82	5	1.90	8	1.64	5	—	—	10.26	16
Hmong	—	—	0.29	1	—	—	1.63	4	0.36	1	0.95	4	0.33	1	4.49	4	—	—
Filipino	0.48	1	0.59	2	1.12	2	2.45	6	—	—	1.19	5	0.33	1	—	—	3.85	6
Asian Indian	0.97	2	—	—	—	—	1.22	3	0.73	2	—	—	0.33	1	—	—	1.92	3
Vietnamese	0.48	1	8.21	28	—	—	29.80	73	16.36	45	13.10	55	8.20	25	82.02	73	—	—
Cambodian	—	—	1.17	4	—	—	2.04	5	0.73	2	0.95	4	0.98	3	5.62	5	—	—
Laotian	—	—	0.59	2	—	—	2.86	7	1.09	3	1.43	6	1.31	4	7.87	7	—	—
Mexican	—	—	0.59	2	—	—	0.82	2	0.73	2	0.48	2	0.66	2	—	—	1.28	2
Puerto Rican	1.93	4	2.93	10	—	—	13.47	33	8.00	22	7.86	33	10.16	31	—	—	21.15	33
Central American	—	—	0.59	2	—	—	2.04	5	1.45	4	0.95	4	1.31	4	—	—	3.21	5
Dominican	—	—	0.29	1	—	—	0.82	2	0.36	1	0.48	2	0.66	2	—	—	1.28	2
Hispanic	0.48	1	1.17	4	—	—	4.49	11	2.55	7	2.38	10	2.62	8	—	—	7.05	11
South American	0.97	2	0.88	3	—	—	1.22	6	1.45	4	1.43	6	0.98	3	—	—	3.85	6

Table 5 continued.

Variable	General Population		Sport Fishing Families		Commercial Fishing Families		Minority Families		Limited Income Families		Women >15 and ≤ 45		Children ≤ 15		Southeast Asian Families		Non-SE Asian Minority Families		
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	
Primary Language (Household)		206		339		71		242		271		417		301		89			153
English	95.15	196	80.83	274	98.59	70	35.95	87	64.94	176	69.30	289	72.76	219	1.12	1	56.21	86	
Spanish	1.94	4	5.01	17	---	---	17.77	43	12.18	33	9.83	41	11.30	34	---	---	28.10	43	
Chinese	0.97	2	0.29	1	---	---	2.48	6	0.37	1	0.96	4	1.00	3	---	---	3.92	6	
Vietnamese	0.49	1	8.26	28	---	---	30.17	73	12.13	45	13.19	55	8.64	26	80.90	72	0.65	1	
Korean	---	---	0.29	1	---	---	6.20	15	1.85	5	1.68	7	1.66	5	---	---	9.80	15	
Cambodian	---	---	1.18	4	---	---	2.07	5	0.74	2	0.96	4	1.00	3	5.62	5	---	---	
Hmong	---	---	0.29	1	---	---	1.65	4	0.37	1	0.96	4	0.33	1	4.49	4	---	---	
Laotian	---	---	0.59	2	---	---	2.89	7	1.11	3	1.44	6	1.33	4	7.87	7	---	---	
Other	0.97	2	2.06	7	1.41	1	0.83	2	1.85	5	1.68	7	1.99	6	---	---	1.31	2	
Household Education		207		341		73		244		274		418		304		89			155
K-8 th Grade	---	---	2.64	9	---	---	7.79	19	5.84	16	4.31	18	2.96	9	17.98	16	1.94	3	
Some High School	4.35	9	12.02	41	9.59	7	27.46	67	24.82	68	15.79	66	15.79	48	41.57	37	19.35	30	
High School / GED	21.26	44	19.65	107	20.55	15	21.72	53	38.32	105	28.47	119	35.20	107	5.62	5	30.97	48	
Some College	15.94	33	22.87	78	24.66	18	25.00	61	21.53	59	22.73	95	21.38	65	22.47	20	26.45	41	
2 / 4 Yr College Deg	28.50	59	20.53	70	20.55	15	12.30	30	6.57	18	17.94	75	14.80	45	8.99	8	14.19	22	
Postgraduate Degree	29.95	62	9.09	31	23.29	17	5.33	13	1.82	5	9.81	41	9.21	28	2.25	2	7.10	11	
Household Income		207		341		71		244		272		418		304		89			155
\$0 - 4,999	0.97	2	3.23	11	---	---	9.43	23	11.76	32	7.18	30	6.58	20	4.49	4	12.26	19	
\$5,000 - 9,999	1.45	3	6.45	22	---	---	15.16	37	18.28	68	12.20	51	12.50	38	23.60	21	10.32	16	
\$10,000 - 14,999	5.31	11	6.16	21	1.41	1	6.97	17	19.49	53	8.13	34	10.53	32	10.11	9	5.16	8	
\$15,000 - 19,999	6.28	13	5.57	19	4.23	3	11.89	29	19.12	52	10.29	43	12.17	37	7.87	7	14.19	22	
\$20,000 - 24,999	4.35	9	5.28	18	1.41	1	12.70	31	6.62	18	9.57	40	15.13	46	13.48	12	12.26	19	
\$25,000 - 29,999	6.28	13	6.16	21	5.63	4	8.20	20	3.31	9	5.26	22	5.92	18	15.73	14	3.87	6	
\$30,000 - 39,999	10.14	21	8.50	29	11.27	8	9.02	22	3.31	9	10.05	42	10.53	32	8.99	8	9.03	14	
\$40,000 - 49,999	16.91	35	14.08	48	14.08	10	8.61	21	1.10	3	9.81	41	3.62	11	6.74	6	9.68	15	
\$50,000 - 59,999	8.21	17	8.80	30	9.86	7	1.64	4	---	---	4.31	18	3.29	10	---	---	2.58	4	
\$60,000 - 69,999	11.11	23	4.69	16	12.68	9	1.64	4	---	---	4.78	20	2.96	9	3.37	3	0.65	1	
≥ \$70,000	23.19	48	15.84	54	35.21	25	4.10	10	---	---	10.29	43	9.87	30	2.25	2	5.16	8	
Food Stamp Recipient		206		339		71		242		271		417		301		89			153
Yes	0.49	1	9.44	32	0	---	26.03	63	35.42	96	22.54	94	25.58	77	28.09	25	24.84	38	
No	99.51	205	87.32	296	100.00	71	72.73	176	63.10	171	76.74	320	74.09	223	68.54	61	75.16	115	

Table 6. Breakdown of individual demographic information by population, including two subsets of minority population, Southeast Asians and non-Southeast Asian minorities. Populations are not mutually exclusive.

Variable	General Population		Sport Fishing Families		Commercial Fishing Families		Minority Families		Limited Income Families		Women >15 and ≤45		Children ≤15		Southeast Asian Families		Non-SE Asian Minority Families	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Total Households		207		341		73		245		276		420		305		89		156
Total Individuals		437		504		178		860		937		493		559		329		531
Gender		437		504		178		860		937		497		559		329		531
Male	47.37	207	72.42	365	54.49	97	45.47	391	44.50	417	---	---	52.77	295	47.72	157	44.07	234
Female	46.45	203	26.98	136	45.51	81	54.42	468	55.18	517	100.00	497	47.23	264	52.28	172	55.74	296
Age Categories		433		497		177		852		926		493		559		325		527
Children ≤15	19.40	84	13.08	65	14.12	25	32.04	273	38.66	358	---	---	100.00	559	19.38	63	39.85	210
Females, >15 & ≤45	21.71	94	17.30	86	15.25	27	28.52	243	27.97	259	99.80	492	---	---	26.77	87	29.60	156
Females, >45 & ≤65	12.47	54	4.02	20	18.08	32	8.10	69	5.72	53	0.20	1*	---	---	10.46	34	6.64	35
Males, >15 and ≤65	30.72	133	53.12	264	36.16	64	28.52	243	21.92	203	---	---	---	---	38.77	126	22.20	117
Adults >65	15.70	68	12.47	62	14.69	26	2.82	24	5.72	53	---	---	---	---	4.62	15	1.71	9
Pregnant Women	7.45	7	11.63	10	3.70	1	10.70	26	3.78	35	10.34	51	---	---	6.90	6	12.82	20
Lactating Women	3.19	3	3.49	3	7.41	2	3.29	8	5.79	15	4.46	22	---	---	---	---	5.13	8
Eat fish / seafood		437		504		178		860		937		497		559		329		531
Yes	89.24	390	97.22	490	97.19	173	89.88	773	85.91	805	93.16	463	74.78	418	100.00	329	83.62	444
No	10.76	47	2.38	12	2.81	5	10.12	87	14.09	132	6.84	34	24.87	139	---	---	16.38	87

* One woman in >45 and ≤65 category included because she was breastfeeding

seafood consumed, either caught by self, family member or friend, purchased in a store, or served in a restaurant. The percent of individuals in each population consuming the targeted species is provided in Table 7. Two species in particular, bluefish and striped bass, are listed in the State of Connecticut fish consumption advisories. High-risk populations listed in the advisories include pregnant or lactating women, women planning to become pregnant within one year, and children under the age of six. For this study's purposes, women of childbearing age and children 15 and younger were included to represent these high-risk populations. More than 23% of the women and 21% of the children ate bluefish, and 17% of the women and 14 % of the children ate striped bass. The results also reflect the national popularity of canned tuna fish among the study populations.

The categories for sources of the fish and seafood consumed were caught by self, family member or friend, purchased in a store, or served in a restaurant, cafeteria or school. The breakout of the responses for each species is given in Table 8 for the total study population. This table also provides a look at the breadth of fish and seafood consumed in Connecticut. The majority of seafood in the overall study sample was purchased at a store, with the exception of some freshwater species, which are not available for purchase. A substantial percentage of fish was also caught, reflecting the activities of two of the populations targeted, sport fishing and commercial fishing families. A smaller percentage of seafood was consumed in restaurants. In all, 85 different species of fish and seafood were listed by the participants in the survey overall.

Southeast Asians tend to avoid processed foods like frozen fish sticks, lobster roll, clam chowder and clam strips. Dried forms of seafood, like shrimp and perch, are frequently consumed in soups.

C. Frequency of Consumption, Meal Size and Seasonal Patterns

In addition to knowing the types and sources of fish and seafood people are eating, it is helpful to know how often they are eating seafood, what the typical portion size is, and whether consumption rates vary by month or season.

Table 7. Percent of seafood-eating respondents who eat “target fish” in survey. Populations are not mutually exclusive.

Variable	General Population N = 390		Recreational Angling Families N= 492		Commercial Fishing Families N= 172		Minority Families N= 774		Limited Income Families N= 805		Women >15 and ≤ 45 N= 464		Children ≤ 15 N= 418		Southeast Asian Families N=329		Non-SE Asian Minority Families N=445	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
	Lobster	59.49	232	60.37	297	87.21	150	33.33	258	36.02	290	52.59	244	31.58	132	18.54	61	44.27
Lobster roll	39.74	155	22.15	109	37.21	64	15.63	121	16.02	129	27.37	127	16.27	68	---	---	27.19	121
Blue Crab	12.56	49	29.67	146	43.02	74	31.52	244	23.35	188	23.06	107	15.31	64	50.46	166	17.53	78
Crab Cake	15.13	59	11.38	56	20.93	36	7.62	59	6.96	56	10.13	47	7.18	30	---	---	13.26	59
Clams	41.28	161	51.22	252	55.23	95	28.17	218	28.32	228	35.13	163	20.10	84	30.09	99	26.74	119
Clam Chowder	65.64	256	41.26	203	74.42	128	16.41	127	29.81	240	41.59	193	29.43	123	---	---	28.54	127
Clam Strips	31.03	121	22.36	110	29.65	51	14.21	110	20.50	165	28.88	134	19.38	81	---	---	24.72	110
Oysters	18.21	71	14.63	72	22.09	38	13.57	105	9.57	77	12.72	59	7.18	30	4.56	15	20.22	90
Oyster Stew	8.46	33	1.63	8	11.05	19	1.03	8	0.37	3	1.51	7	0.96	4	---	---	1.80	8
Mussels	16.41	64	19.11	94	36.05	62	10.98	85	8.45	68	13.58	63	5.98	25	12.77	42	9.66	43
Bluefish	22.31	87	47.36	233	45.93	79	31.14	241	24.10	194	23.49	109	21.05	88	29.18	96	32.58	145
Striped Bass	11.79	46	38.41	189	52.33	90	20.80	161	16.15	130	16.59	77	13.64	57	27.96	92	15.51	69
Eel	2.56	10	5.89	29	13.95	24	4.65	36	2.86	23	3.23	15	1.67	7	5.17	17	4.27	19
Porgy	4.62	18	17.07	84	14.53	25	27.78	215	17.02	137	16.81	78	13.40	56	26.14	86	28.99	129
Tautog	4.87	19	25.00	123	50.58	87	6.33	49	7.95	64	7.76	36	5.50	23	6.38	21	6.29	28
Tuna, canned	87.69	342	71.14	350	88.95	153	53.10	411	70.81	570	74.35	345	71.05	297	26.75	88	72.58	323
Tuna, fresh	27.95	109	22.15	109	41.28	71	16.54	128	14.16	114	21.12	98	10.05	42	25.53	84	9.89	44
Fish Sticks	44.87	175	27.24	134	36.63	63	24.03	186	38.26	308	37.28	173	53.83	225	---	---	41.80	186
Surimi	33.59	131	16.67	82	36.63	63	12.92	100	15.16	122	20.47	95	16.75	70	3.65	12	19.78	88

Table 8. Sources of fish and seafood in Connecticut by species. Respondents could check off as many choices as applied, which led to multiple categories. Percentages are given, with actual number of responses in parentheses.

Fish/Seafood	Caught by Self, Family, Friend	Purchased in Store	Served in Restaurant	Caught / Bought in Store	Caught / Served in Restaurant	Bought in Store / Served in Restaurant	Caught, Bought in Store, Served in Restaurant
Caviar	20.0 (2)	80.0 (8)	---	---	---	---	---
Combination Platter	---	---	100.0 (3)	---	---	---	---
Fish Sticks	---	91.3 (513)	3.0 (17)	---	---	2.7 (15)	---
Gefilte Fish	---	100.0 (4)	---	---	---	---	---
Lox	---	62.5 (10)	---	---	---	---	---
Seafood Salad	---	90.0 (9)	10.0 (1)	---	---	---	---
Sushi	---	---	33.3 (6)	---	---	---	---
Frozen Fish Fillet	---	80.0 (21)	19.2 (5)	---	---	---	---
Fish Cakes	---	83.3 (5)	---	---	16.7 (1)	---	---
Fish Chowder, canned	---	100.0 (1)	---	---	---	---	---
Anchovies	---	60.6 (20)	12.1 (4)	---	---	24.2 (8)	---
Anchovies, canned	---	40.0 (2)	---	---	---	---	---
Bass, Calico	100.0 (2)	---	---	---	---	---	---
Bass, Largemouth	83.3 (15)	---	5.6 (1)	11.1 (2)	---	---	---
Bass, Sea	26.5 (9)	70.6 (24)	---	---	---	2.9 (1)	---
Bass, Smallmouth	68.0 (17)	24.0 (6)	---	8.0 (2)	---	---	---
Bass, Striped	77.0 (238)	10.7 (33)	2.6 (8)	4.2 (13)	1.0 (3)	1.6 (5)	1.9 (6)
Bass, Unspecified	59.3 (35)	20.3 (12)	---	10.2 (6)	---	8.5 (5)	---
Blackfish	83.3 (210)	7.5 (19)	0.8 (2)	5.2 (13)	0.4 (1)	0.8 (2)	0.4 (1)
Blowfish	100.0 (1)	---	---	---	---	---	---
Bluefish	60.8 (268)	19.0 (84)	6.6 (29)	8.8 (39)	0.2 (1)	0.9 (4)	---
Bonito	50.0 (1)	50.0 (1)	---	---	---	---	---
Bream	---	---	75.0 (3)	---	---	25.0 (1)	---
Bullhead	100.0 (6)	---	---	---	---	---	---
Butterfish	---	100.0 (96)	---	---	---	---	---
Carp	67.6 (25)	24.3 (9)	---	8.1 (3)	---	---	---
Catfish	36.4 (80)	39.5 (87)	4.5 (10)	7.3 (16)	0.9 (2)	7.3 (16)	3.2 (7)
Cod	9.5 (31)	61.7 (201)	10.7 (35)	0.3 (1)	0.6 (2)	13.5 (44)	0.6 (2)
Cod, Dried	---	100.0 (1)	---	---	---	---	---
Covina, Yellow	---	100.0 (8)	---	---	---	---	---
Crappie	50.0 (11)	50.0 (11)	---	---	---	---	---
Dolphinfish	2.9 (1)	47.1 (16)	26.5 (9)	---	5.9 (2)	14.7 (5)	---
Drum	100.0 (1)	---	---	---	---	---	---
Eel, American	62.1 (36)	13.8 (8)	6.9 (4)	3.4 (2)	---	1.7 (1)	1.7 (1)
Flounder	32.4 (200)	39.9 (246)	5.5 (34)	4.2 (26)	2.3 (14)	11.8 (73)	2.1 (13)
Grouper	---	27.8 (5)	55.6 (10)	---	---	---	16.7 (3)
Grunt	---	100.0 (1)	---	---	---	---	---
Halibut	---	59.6 (34)	14.0 (8)	---	5.3 (3)	21.1 (12)	---
Hake	11.1 (3)	70.4 (19)	3.7 (1)	---	---	---	---
Herring	---	83.3 (15)	11.1 (2)	---	---	5.6 (1)	---
Herring, canned	---	100.0 (3)	---	---	---	---	---
Herring, Dried	---	100.0 (1)	---	---	---	---	---
Mackerel	2.7 (5)	95.7 (177)	1.6 (3)	---	---	---	---
Mackerel, canned	---	100.0 (4)	---	---	---	---	---
Milkfish	---	100.0 (6)	---	---	---	---	---
Monkfish	---	69.2 (9)	---	---	---	30.8 (4)	---
Mullet	---	100.0 (54)	---	---	---	---	---
Northern Pike	37.5 (9)	62.5 (15)	---	---	---	---	---
Orange Roughy	---	78.6 (11)	21.4 (3)	---	---	---	---
Perch, Ocean	14.3 (2)	64.3 (9)	7.1 (3)	14.3 (2)	---	---	---
Perch, White	60.7 (37)	39.3 (24)	---	---	---	---	---
Perch, Yellow	51.9 (14)	33.3 (9)	14.8 (4)	---	---	---	---
Perch, Unspecified	47.4 (18)	52.6 (20)	---	---	---	---	---
Pickering	100.0 (5)	---	---	---	---	---	---
Pollock	8.6 (3)	82.9 (29)	2.9 (1)	---	---	2.9 (1)	---
Porgy	36.4 (99)	56.6 (154)	1.1 (3)	4.4 (12)	0.4 (1)	0.7 (2)	---
Salmon	0.7 (4)	74.1 (418)	4.6 (26)	---	0.2 (1)	16.8 (95)	0.2 (1)
Sardines	---	96.6 (28)	3.4 (1)	---	---	---	---
Sardines, canned	---	92.9 (26)	---	---	---	7.1 (2)	---
Scrod	---	55.7 (44)	27.8 (22)	---	---	16.5 (13)	---
Shad	2.4 (1)	81.0 (34)	2.4 (1)	---	---	9.5 (4)	---
Shark	20.9 (14)	41.8 (28)	16.4 (11)	3.0 (2)	3.0 (2)	10.4 (7)	---
Sheepshead	100.0 (1)	---	---	---	---	---	---
Skate/Ray	---	100.0 (33)	---	---	---	---	---
Smelt	10.0 (1)	50.0 (5)	---	40.0 (4)	---	---	---
Snapper	7.3 (3)	41.5 (17)	17.1 (7)	---	---	26.8 (11)	7.3 (3)
Snapper, Pink	---	100.0 (2)	---	---	---	---	---
Snapper, Yellowtail	---	---	100.0 (2)	---	---	---	---
Sole	1.5 (2)	54.1 (72)	16.5 (22)	---	---	23.3 (31)	---
Spot	---	33.3 (4)	---	---	---	---	---
Sunfish, Dried	---	100.0 (24)	---	---	---	---	---
Sunfish, Unspecified	84.5 (109)	9.3 (12)	1.6 (2)	4.7 (6)	---	22.0 (72)	---
Swordfish	---	61.0 (200)	12.8 (42)	---	---	7.7 (1)	---
Tilapia	---	92.3 (12)	---	---	---	4.8 (17)	0.8 (3)
Trout, Unspecified	48.4 (171)	30.6 (108)	2.8 (10)	9.3 (33)	---	5.9 (88)	---
Tuna, Canned	---	91.2 (1,361)	1.5 (22)	---	---	12.5 (47)	1.3 (5)
Tuna, Fresh	16.5 (62)	49.1 (184)	14.7 (55)	0.5 (2)	1.1 (4)	---	---
Turbot	---	100.0 (3)	---	---	---	---	---
Walleye	100.0 (4)	---	---	---	---	---	---

Table 8 continued.

Fish/Seafood	Caught by Self, Family, Friend	Purchased in Store	Served in Restaurant	Caught / Bought in Store	Caught / Served in Restaurant	Bought in Store / Served in Restaurant	Caught, Bought in Store, Served in Restaurant
Weakfish	100.0 (4)	---	---	---	---	---	---
Whitefish, FW	40.3 (27)	47.8 (32)	---	9.0 (6)	---	3.0 (2)	---
Whitesucker	100.0 (6)	---	---	---	---	---	---
Whiting (Kingfish)	---	100.0 (22)	---	---	---	---	---
Whiting, Unspecified	8.5 (6)	85.9 (61)	---	2.8 (2)	---	---	---
Clams	8.4 (117)	32.8 (459)	27.5 (385)	2.6 (37)	1.5 (21)	22.9 (320)	0.6 (8)
Crab, Blue	20.5 (134)	43.1 (282)	17.4 (114)	3.2 (21)	0.3 (2)	13.0 (85)	0.3 (2)
Lobster	12.2 (163)	31.3 (418)	28.0 (374)	1.4 (19)	0.7 (10)	23.1 (309)	1.6 (22)
Mussels	12.2 (35)	34.0 (98)	28.5 (82)	1.0 (3)	1.7 (5)	17.0 (49)	0.3 (1)
Oysters	5.6 (19)	32.8 (111)	31.4 (106)	---	0.3 (1)	23.4 (79)	0.3 (1)
Scallops, Unspec.	0.8 (4)	28.5 (141)	23.9 (118)	0.4 (2)	1.4 (7)	41.1 (203)	0.2 (1)
Scungilli	21.7 (5)	17.4 (4)	13.0 (3)	---	---	8.7 (2)	8.7 (2)
Shrimp	0.2 (3)	54.3 (863)	16.9 (269)	---	---	27.4 (436)	---
Squid	1.9 (8)	53.2 (224)	20.4 (86)	---	---	20.9 (88)	0.5 (2)
Surimi	---	81.5 (352)	5.1 (22)	---	---	10.2 (44)	---

1. Frequency of Fish / Seafood Meals

More than one-third of the survey participants ate 1+ to 2 meals of fish or seafood per week, including 39% of the general population, 35% of sport fishing family members, 38% of commercial fishing and minority family members, and 39% of limited income household members (Table 9; Figure 1). Among the Southeast Asians, 36.3% consume 2-3 meals per week, and 2.1% consume five or more meals per week. Among the non-Southeast Asian minorities, 43% consume 1-2 meals of seafood per week. Women of childbearing age and children exhibited a similar trend, with 35% and 38% having 1+ to 2 meals of seafood per week, respectively. In general, seafood consumption is high in Connecticut: 58.1% of the general population, 61.6% of the sport fishing population, 65.2% of the children, 66.1% of the women of childbearing age, 69.2% of the commercial fishing 73.7% of the non-Southeast Asian minorities, 80.8% of all minorities, and 90.9% of the Southeast Asians consumed at least one meal per week (Table 9; Figure 1).

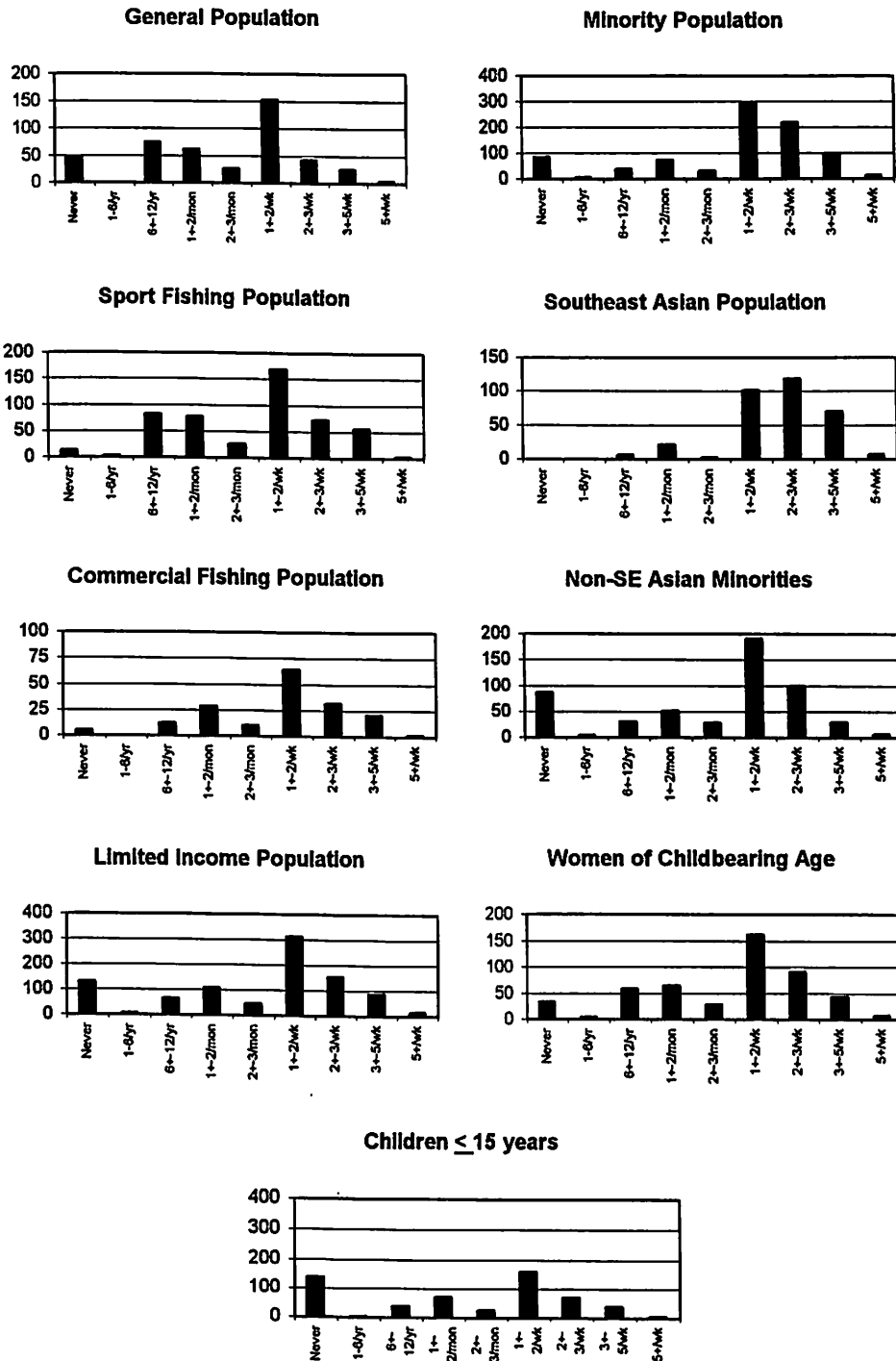
2. Average Meal Size

A key factor in calculating the amount of risk inherent in the consumption of certain fish and seafood, is the average meal size per time per individual. Using the source information (caught, bought in store,

Table 9. Frequency of fish/seafood consumption by population, including two subsets of minority population, Southeast Asians and Non-Southeast Asian minorities. Populations are not mutually exclusive.

Variable	General Population		Sport Fishing Families		Commercial Fishing Families		Minority Families		Limited Income Families		Women >15 and ≤ 45		Children ≤ 15		Southeast Asian Families		Non-SE Asian Minority Families	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Total Households		207		341		73		245		276		420		305		89		156
Total Individuals		437		504		178		860		937		493		559		329		531
How Often Eat Seafood		391		492		172		774		805		463		417		328		444
1-6 meals/year	---	---	0.41	2	---	---	0.52	4	0.75	6	0.86	4	0.48	2	---	---	0.90	4
6+ -12 meals / year	19.18	75	16.67	82	7.56	13	4.91	38	8.32	67	12.74	59	9.83	41	1.83	6	7.21	32
1+ -2 meals / month	15.86	62	15.85	78	16.86	29	9.56	74	13.54	109	14.04	65	17.03	71	6.71	22	11.71	52
2+ - 3 meals / month	6.91	27	5.49	27	6.40	11	4.01	31	5.84	47	6.26	29	6.24	26	0.61	2	6.53	29
1+ - 2 meals / week	39.13	153	34.55	170	37.79	65	37.73	292	39.01	314	35.21	163	38.37	160	31.10	102	42.79	190
2+ - 3 meals / week	11.25	44	14.84	73	18.60	32	28.42	220	19.50	157	19.87	92	17.03	71	36.28	119	22.75	101
3+ - 5 meals / week	6.65	26	11.59	57	12.21	21	12.92	100	11.06	89	9.50	44	9.83	41	21.34	70	6.76	30
5+ meals / week	1.02	4	0.61	3	0.58	1	1.68	13	1.99	16	1.51	7	0.12	5	2.13	7	1.35	6

Figure 1. Frequency patterns for seafood consumption by population, where x axis reflects number of times per year seafood is typically eaten, and y axis reflects number of individuals. Populations are not mutually exclusive.



eaten in restaurant) with the exception of three “mixed categories (caught/bought; caught/restaurant; caught, bought and eaten in restaurant), the species codes were sorted into two categories: “caught fish” and “bought fish”, also known as recreational fish and commercial fish. “Caught fish” included all fish caught by individuals, family members or friends, including both saltwater and freshwater fish, while “bought fish” included all fish purchased in a store or eaten in a restaurant. Average meal size per time and average number of meals were calculated for each population for total “caught fish” and “bought fish” (Table 10). For all populations, there was a difference between the average meal size of “caught fish” versus “bought fish” where meals of fish or seafood purchased in the store or at a restaurant were smaller (Figure 2). It is possible that the study participants found it more difficult to estimate portion sizes of “caught” fish and they overestimated them. It is also possible that individuals felt freer to consume larger quantities of “caught” fish, for which they did not have to pay.

The general population, on average, consumed 4.2 ounces of fish per meal of purchased fish and 5.0 ounces per meal of caught fish. In comparison, individuals in the sport fishing population consumed an average of 4.7 ounces per meal of purchased fish, and 7.3 ounces of “caught” fish (Table 10). Southeast Asians consumed smaller portions (3.4 ounces and 7.0 ounces for bought and caught fish, respectively), but more frequently (33 “bought” meals and 9 “caught” meals per year) (Table 10). As expected, the children’s portion sizes were the smallest, 2.7 ounces of purchased fish and 3.9 ounces of caught fish. Roughly one-third of all fish and seafood meals consumed by each population were “caught” (Table 10), with the general population consuming the fewest number of seafood meals overall.

The range for the number of ounces consumed per time was 0.1 ounces to 85.0 ounces of caught fish. The range of ounces consumed for bought fish was 0.1 to 47.3 ounces (Table 10). Most of the large meals of “caught” fish were striped bass and bluefish, while the largest meal of “bought” fish was butterfish. These portions are very high, and were questioned. Every attempt was made to verify them.

This information was also calculated by species and population, and is provided for five saltwater species (bluefish, striped bass, blackfish, porgy and flounder) in Appendix 16. For bluefish, with the

exception of the Southeast Asians and the children, average meal size was slightly greater for bluefish than for all species consumed combined. Non-Southeast Asian minorities consumed the most bluefish per meal, 11.2 ounces, while children ate the smallest portions, just over 2 ounces. For all populations except the general population, average meal size for “caught” bluefish was greater than the meal size of “bought” bluefish (Appendix 16).

Sport fishing, commercial fishing and limited income families all consumed larger portion sizes of striped bass than overall, while women and children tended to consume slightly less than average (Appendix 16). There was no real difference in meal size for the general population and minority populations. Sport fishermen consumed the largest meals of striped bass, averaging 9.6 ounces, with a range of 0.6 to 85. In all cases, “bought” portions were smaller than “caught” portions, in some cases about 40% less.

For blackfish, the sizes of meals purchased tended to be smaller than the average for all species consumed, and the meal size for “caught” fish once again was greater than the average for all species (Appendix 16). “Caught” meal sizes ranged from 4.8 to 9.1 ounces, with limited income (9.1 ounces), Southeast Asians (8.3 ounces) and sport fishermen (8.0 ounces) leading the way. Average meal size of flounder ranged from 2.4 to 4.6 ounces (bought) to 2.3 to 11.8 ounces (caught). Meals of porgy averaged 3.3 to 8.8 ounces (bought) and 2.6 to 6.2 ounces (caught), with children consuming the smallest amounts (Appendix 16). Meals of flounder ranged from 2.4-5.6 ounces of “bought” fish, and from 2.3-11.8 ounces of “caught” fish.

3. Mean Number of Meals of Fish / Seafood Per Year

The average number of meals of fish or seafood consumed per year ranged from 0 to 364 (Table 10). For all populations, more meals were consumed from fish or seafood purchased in a store or restaurant than were consumed from fish or seafood caught by an individual or household member. The average number of meals per year for “caught fish” ranged from 8-10 meals per year, with the exception of the general population, which averaged about five meals of “caught fish” per year. For “bought fish” meals,

Clarification of Table 10 data. The data presented represents only a subset of the meals consumed. Survey participants were asked to list each species of seafood eaten, and how they obtained it (caught by self, family member or friend), purchased in store or served in a restaurant). In the case where more than one source was indicated, we had no way of knowing how many meals fell into each category. As a result, only data where one source was indicated were used in the calculations for this table; all other data were excluded. See Appendix A-7 for review of survey form.

Table 10. Mean meal size (ounces) per time and mean number of fish / seafood meals by population, for “caught fish” including both saltwater and freshwater species, and “bought fish” including all fish or seafood purchased from a store or eaten away from home.

Population	Type of Meal	Mean meal size (oz) per time					Mean no. of meals per year				
		N	Std Dev	Min	Max	N	Std Dev	Min	Max		
General Population	Bought	3,091	4.2	3.4	0.1	40.0	3,094	10.4	18.0	0.5	364.0
	Caught	124	5.0	3.2	0.6	21.3	136	5.4	7.8	1.0	52.0
Sport Fishing Population	Bought	2,930	4.7	3.8	0.1	47.3	2,960	18.3	35.4	0.9	364.0
	Caught	1,083	7.3	6.5	0.3	85.0	1,101	10.1	15.7	0.9	156.0
Commercial Fishing Population	Bought	1,139	4.6	4.0	0.1	34.0	1,153	12.4	20.5	1.0	260.0
	Caught	601	5.2	3.8	0.2	34.0	609	10.2	21.2	0.9	364.0
Minority Population	Bought	5,000	3.9	4.5	0.1	42.5	5,010	28.9	39.8	0.9	364.0
	Caught	546	7.1	5.2	0.2	35.4	546	9.0	11.9	0.0	104.0
Southeast Asian Population	Bought	2,255	3.4	2.6	0.1	21.3	2,258	32.9	43.5	1.0	260.0
	Caught	359	7.0	4.5	0.2	22.7	359	8.8	11.2	0.0	78.0
Non-SE Asian Minority Pop.	Bought	2,745	4.3	5.6	0.1	42.5	2,752	25.6	36.1	0.9	364.0
	Caught	187	7.1	6.4	0.9	35.4	187	9.5	13.1	1.0	104.0
Limited Income Population	Bought	4,664	3.9	3.9	0.1	32.0	4,647	30.1	46.6	0.9	364.0
	Caught	516	7.1	5.7	0.2	51.0	521	9.8	17.1	1.0	156.0
Women >15 & ≤45	Bought	3,209	4.1	3.4	0.1	47.3	3,216	22.1	36.1	1.0	364.0
	Caught	334	5.9	4.7	0.6	47.2	335	8.0	12.0	0.9	105.0
Children ≤15	Bought	2,094	2.7	4.3	0.1	30.7	2,095	26.8	41.5	0.9	364.0
	Caught	170	3.9	3.7	0.1	20.0	175	8.4	10.8	1.0	78.0

the average ranged from 10 meals per year (general population) to 33 meals per year (Southeast Asians) (Table 10; Figure 3).

The average number of bluefish meals per year ranged from 0 to 44.7 (bought) and 2.3 to 17.2 (caught), with Southeast Asians eating more meals of bluefish on average, and the general population consuming bluefish infrequently (Appendix 16). The average number of striped bass meals ranged from 3.6 to 17.1 caught meals, and from 3.2 to 11.7 bought meals. The average number of blackfish meals consumed per year ranged from 4.4-20.7 (caught) and from 1.7-20.7 (bought) (Appendix 16). Caught meals of flounder and porgy ranged from 3.3-19.5 and from 4.9-10.1 per year, respectively, while bought meals ranged from 3.2-22.1 and from 10.6-35.1 per year, respectively (Appendix 16).

Figure 2. Mean meal size per time in ounces by population. Populations are not mutually exclusive.

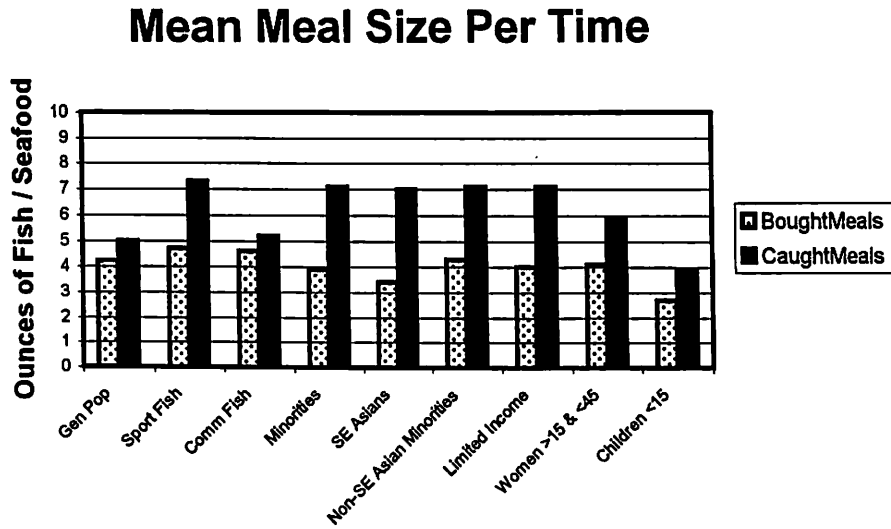
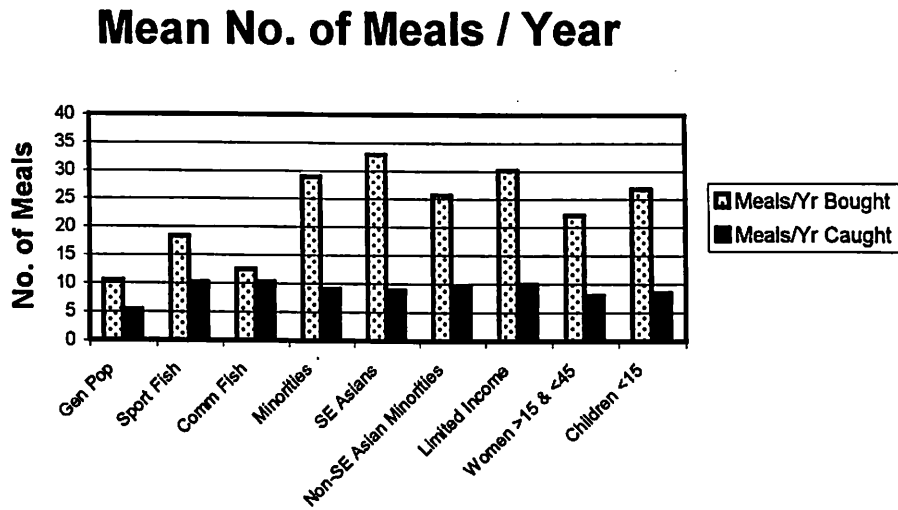


Figure 3. Mean number of meals of fish/seafood per year by population. Populations are not mutually exclusive.



4. Monthly / Seasonal Consumption Patterns

The months of the year in which each fish or seafood was eaten was collected to help assess monthly or seasonal patterns in consumption. Individual responses by population are provided in Appendix 17, while the overall total monthly consumption patterns by species for all individuals included in the study are shown in Figure 4. If the response provided for sportfish species was “during the season” and could not be pinpointed more definitively, then the following seasonal timeframes were used: bluefish, May to October; striped bass, May to October; scup, June to September; blackfish, May-June and October-November. While some of the aforementioned species are available year-round, the more conservative approach was to only include peak periods, although these timeframes may be overly generous in themselves. The patterns show an increase in consumption during the summer months for freshwater bass (largemouth and smallmouth), carp, catfish, sunfish, trout, and white perch, corresponding to peak fishing activity during warmer months. Yellow perch consumption remained quite steady year-round. For saltwater fish, consumption patterns again increased during the summer months for striped bass, porgy, bluefish, blackfish and flounder / flatfish species, along with lobsters and blue crabs. This period is again the most active period for fishing activities, and consumption patterns also parallel the seasonal appearances of some of these fish species. The consumption of clams and mussels also rose during the summer months, while remaining fairly steady for oysters year-round.

Consumption of commercially-harvested or farm-raised species, such as tilapia, salmon, shrimp, squid, scallops, haddock, halibut, pollock and sole, and prepared foods like frozen fish sticks or cakes and canned tuna, remained steady throughout the year, reflecting the frequency rates for general seafood consumption.

D. Total Fish and Seafood Consumption

For each population, the mean total grams consumed per day were calculated for each freshwater and saltwater species (Appendix 18). The total amount consumed in a year by all individuals in a population was totaled and the mean consumption in grams (and ounces) per day was calculated for each *population*

Figure 4. Monthly consumption patterns by species for total population. X axis reflects months of year in which species of fish or seafood is typically eaten, and y axis reflects number of individuals that eat that species during each month.

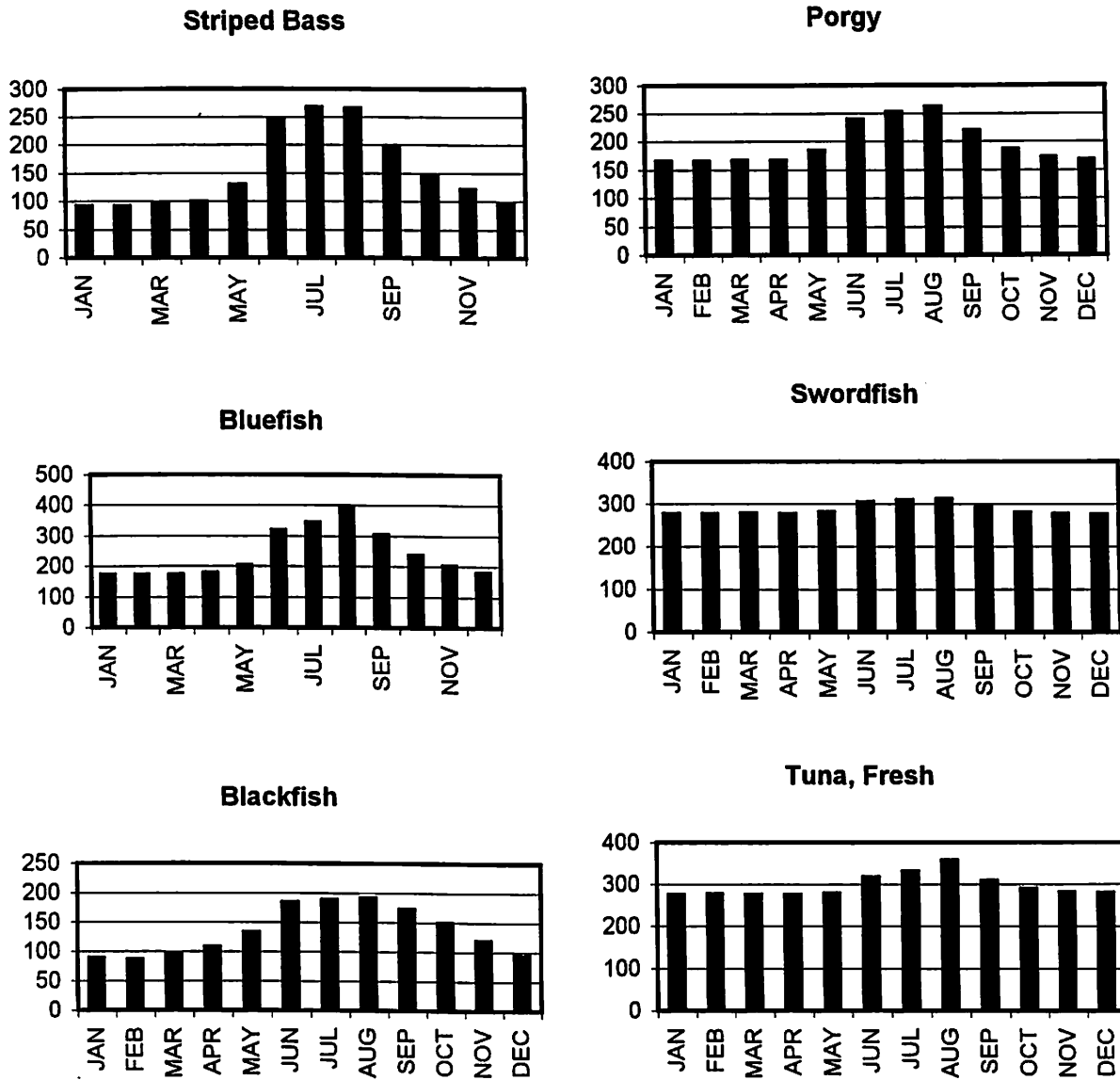
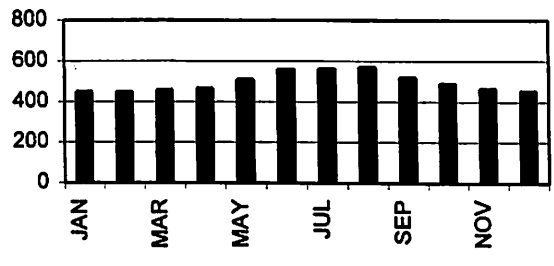
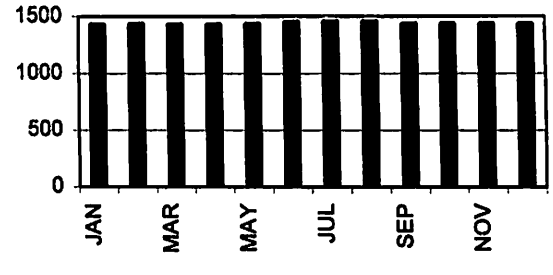


Figure 4 continued.

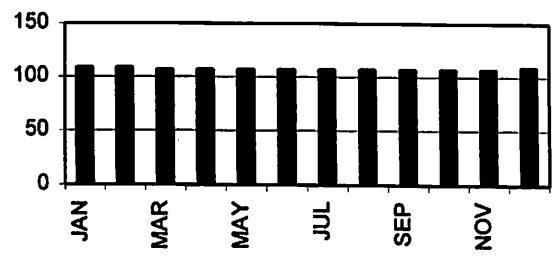
Flounder / Flatfish



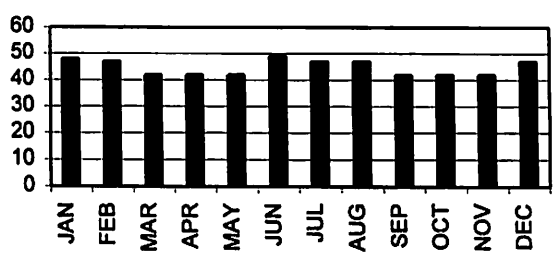
Tuna, Canned



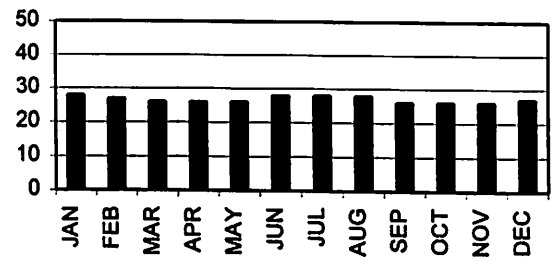
Haddock



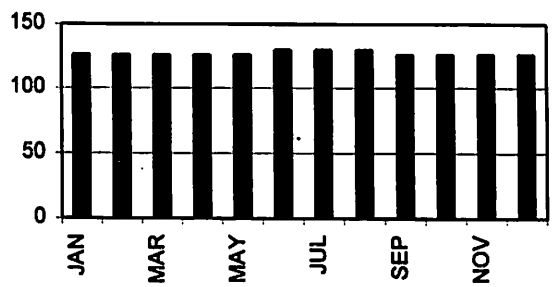
Halibut



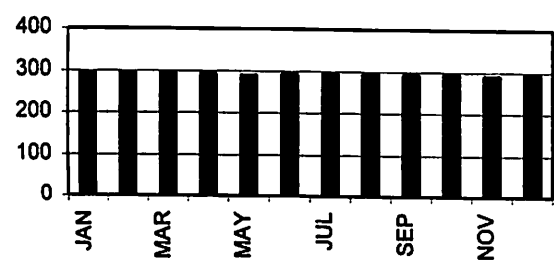
Pollock



Sole



Codfish



Frozen Fish Sticks / Patties

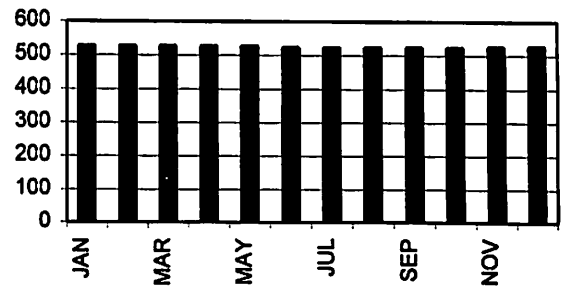
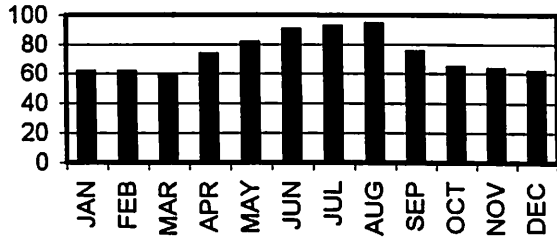
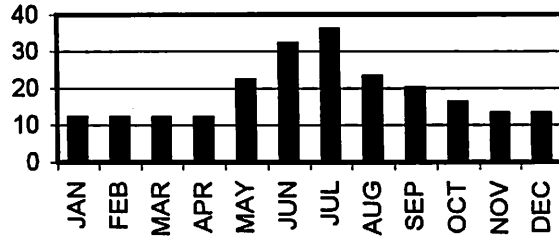


Figure 4 continued.

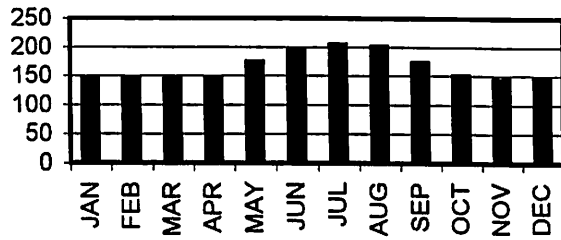
Freshwater Bass



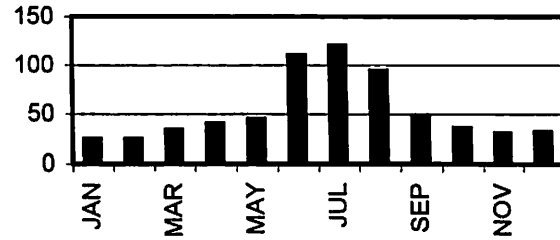
Carp



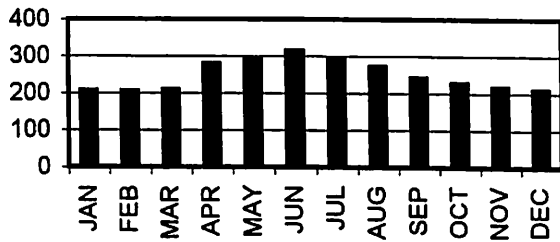
Catfish



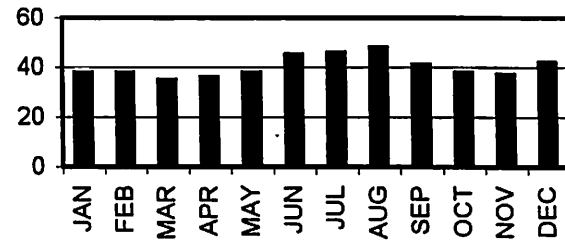
Sunfish



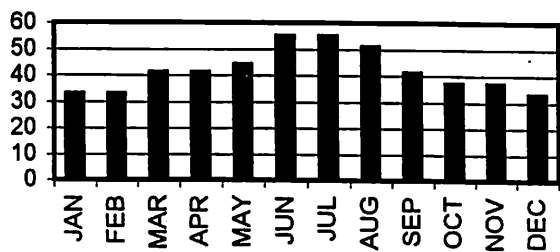
Trout



American Eel



White Perch



Yellow Perch

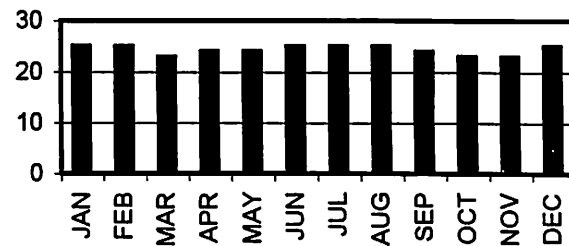
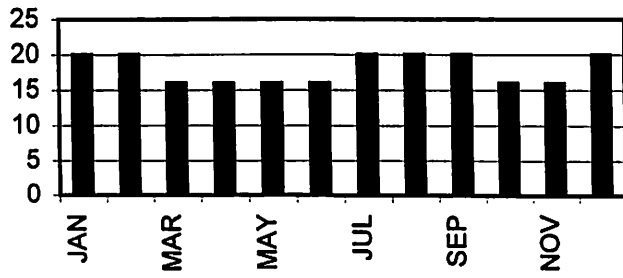
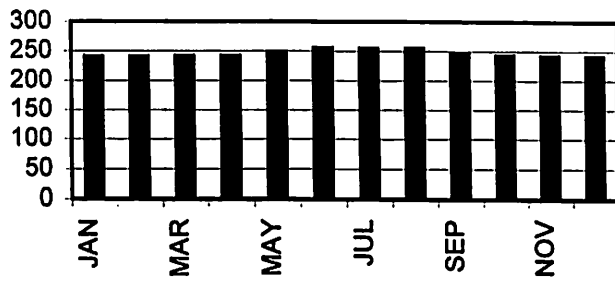


Figure 4 continued.

Northern Pike



Salmon



Tilapia

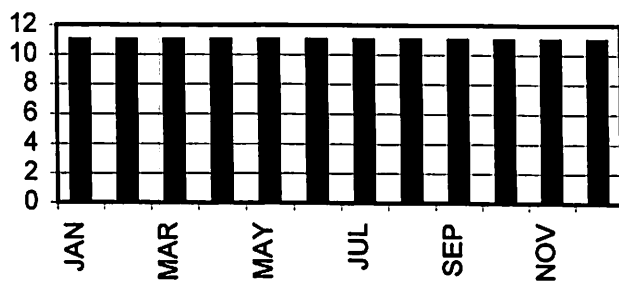
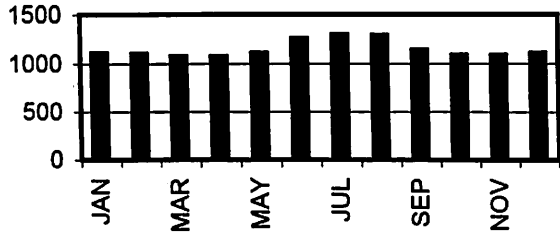
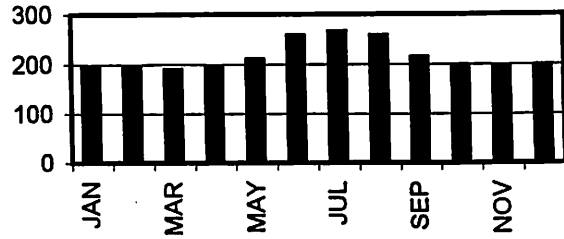


Figure 4 continued.

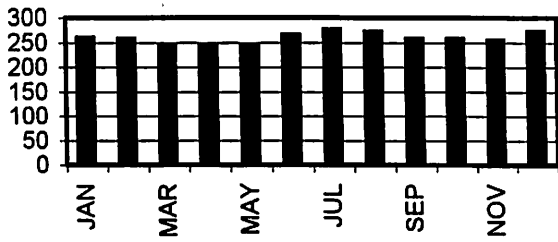
Clams



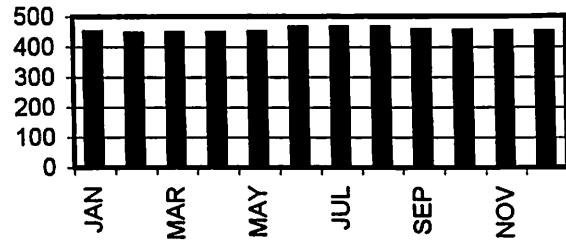
Mussels



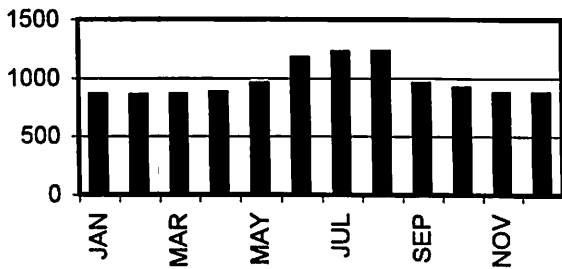
Oysters



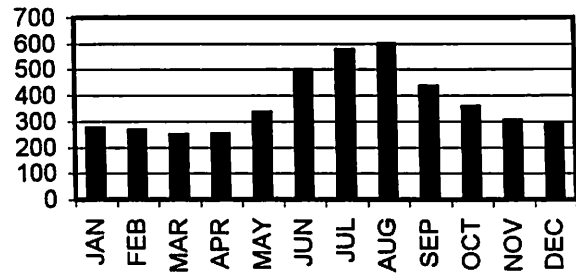
Scallops



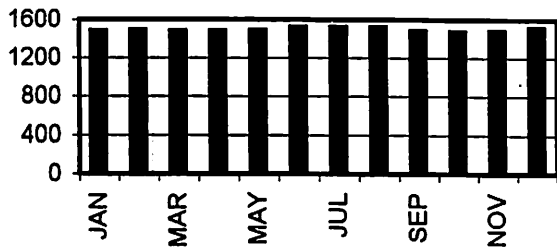
Lobster



Blue Crab



Shrimp



Squid

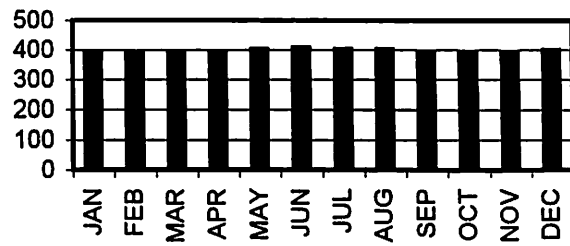


Table 11. Mean total grams of fish and seafood consumed per day for all populations. Populations are not mutually exclusive.

Population	n	Mean total grams / day	Std. Dev.	Minimum	Maximum
General	437	27.7	42.7	0	494.8
SportFish	502	51.1	66.1	0	586.0
Commercial	178	47.4	58.5	0	504.3
Minority	861	50.3	57.5	0	430.0
SE Asian	329	59.2	49.3	0.13	245.6
NonAsian	532	44.8	61.5	0	430.0
Limited Income	937	43.1	60.4	0	571.9
Women >15<45	497	46.5	57.4	0	494.8
Children ≤15	559	18.3	29.8	0	324.8

Table 12. Comparison of mean total consumption in grams per day with national consumption value of 14.3 g/day for all populations of study and 95% confidence limits. In all cases, the $H_0: X \leq 14.3$ g/day was rejected at $\alpha(1) = .05$. Populations are not mutually exclusive.

Population	v	Mean Total Grams/Day	SD	s_x	s_x^2	T-statistic	Critical Value from t Table	95% Confidence Limits
General Population	436	27.7	42.7	2.04	4.17	6.568	$t_{.05(1),400} = 1.649$	27.7 ± 4.0
Sport Fishing Families	501	51.1	66.1	2.95	8.69	12.487	$t_{.05(1),500} = 1.648$	51.1 ± 5.8
Commercial Fishing Families	177	47.4	58.5	4.38	19.22	7.539	$t_{.05(1),170} = 1.654$	47.4 ± 8.6
Limited Income Families	936	43.1	60.4	1.97	3.89	14.616	$t_{.05(1),900} = 1.647$	43.1 ± 3.9
Minority Families	860	50.3	57.5	1.96	3.84	18.358	$t_{.05(1),800} = 1.647$	50.3 ± 3.8
Southeast Asian Families	328	59.2	49.3	2.72	7.37	16.528	$t_{.05(1),300} = 1.650$	59.2 ± 5.4
Non-SE Asian Families	531	44.8	61.5	2.67	7.11	11.437	$t_{.05(1),500} = 1.648$	44.8 ± 5.2
Women >15 and ≤45	496	46.5	57.4	2.58	6.64	12.511	$t_{.05(1),400} = 1.649$	46.5 ± 5.1
Children ≤15	558	18.3	29.8	1.26	1.59	3.153	$t_{.05(1),500} = 1.648$	18.3 ± 8.6

$t = \frac{\bar{X} - \mu}{s_x}$ where the sample standard error of the mean $s_x = s / \sqrt{n}$, and $\mu = 14.3$ g/day

s_x = sample standard error of the mean, and s_x^2 = sample variance of the mean, and $v = n-1$ degrees of freedom

$$CI = \bar{X} \pm t_{.05(2),v} (s_x)$$

(Table 11). The values generated were compared to $\mu = 14.3$ g/day, using a one-tailed hypothesis test to compare two means ($H_0: X \leq 14.3$ g/day and $H_A: X > 14.3$ g/day and if $t \geq t_{.05(1),v}$ where $v = n-1$, then H_0 is rejected) (Zar, 1984), with the results listed in Table 12.

On average, the general population consumed 27.7 g/day (1.0 oz/day) of fish and seafood, while the sport fishing population consumed 51.1 g/day (1.8 oz/day) (Table 11). The commercial fishing population had an average consumption rate of 47.4 g/day (1.7 oz/day). The overall minority population's consumption rate was 50.3 g/day (1.8 oz/day) and the limited income population's rate was 43.1 g/day (1.5 oz/day). Southeast Asians consumed fish and seafood at an average rate of 59.2 g/day (2.1 oz/day), the highest rate overall, while non-Asian minorities' consumption rate was 45.0 g/day (1.6 oz/day) (Table 11). The consumption rate among women aged 16 to 45 was 46.5 g/day (1.6 oz/day), while children aged 15 and younger consumed fish and seafood at an average rate of 18.3 g/day (0.6 oz/day).

All population means are significantly different from the national mean of 14.3g/day ($p < .05$) (Table 12). All groups except the commercial fishermen were significant at 90% power.

While comparisons of the total mean consumption between study populations cannot be made, because the populations are not mutually exclusive, comparisons within populations were made. A one-way ANOVA, controlling for height and weight, was run to determine if mean consumption was significantly different between age/gender categories. The five age/gender categories used were: children ≤ 15 years; women > 15 and ≤ 45 ; women > 45 and ≤ 65 ; men > 15 and ≤ 65 ; and adults > 65 . Least square means were calculated and used in the comparisons, to account for difference in sample sizes. The results of these comparisons are provided in Table 13a-j.

No significant differences in total mean consumption were detected among the general population, commercial fishing and non-Asian minority populations (Tables 13a, d, i). However, among the sport fishing population age/gender categories, the children's consumption rate (LSM \pm SEM: 25.4 g/day \pm 9.73) was significantly different from men 15-65 (LSM \pm SEM: 63.2 g/day \pm 4.20; $P < .01$). Women aged 15-45 (LSM \pm SEM: 43.6 g/day \pm 7.96) were also significantly different from men 15-65 (LSM \pm SEM:

63.2 g/day \pm 4.20; $P < .05$) (Table 13b). When sport fishing families are further broken down into Caucasian and Minority subpopulations, the minority population total mean consumption rate (LSM \pm SEM: 57.7 g/day \pm 6.63) is significantly greater than that of the Caucasian population (LSM \pm SEM: 42.5 g/day \pm 4.62; $P < .05$) (Table 13c). Similarly, among limited income families, the fish consumption rate of households engaged in sport fishing (LSM \pm SEM: 59.0 g/day \pm 5.06) was significantly greater than those limited income households in which no one engaged in fishing activities (LSM \pm SEM: 44.1 g/day \pm 2.97; $P < .01$).

Among minority family members, children (LSM \pm SEM: 37.4 g/day \pm 5.20; $P < .01$) were significantly less than all categories except adults >65 (Table 13g). Since there were no significant differences among the non-Southeast Asian minority categories, the source of these differences was within the Southeast Asian population. Comparison within that population revealed the consumption rate of children (LSM \pm SEM: 35.9 g/day \pm 7.65) significantly less than that of women 15-45 (LSM \pm SEM: 75.0 g/day \pm 5.53) and men 15-65 (LSM \pm SEM: 64.5 g/day \pm 4.75; $P < .01$), and from women 45-65 (LSM \pm SEM: 63.9 g/day \pm 8.47; $P < .05$) (Table 13h). Except for the children, Southeast Asians consume a lot of fish and seafood, obviously a very important part of their diet. Southeast Asian children eat nearly 10 g/day more fish and seafood than children in sport fishing families. The high consumption rate among children in non-Southeast Asian minority families (LSM \pm SEM: 41.7 g/day \pm 7.37) is questionable (Table 13i). Most of this data was collected during interviews at WIC clinics, where the mother was for a purpose other than this study. For sake of convenience and speed, less effort may have been taken by the respondent to differentiate between children's portions and adult portions.

Among the population of children, the data verified the expected trend of the older the child, the more fish and seafood he/she eats. While there was no significant difference in consumption rates between children ages 0-5 years (LSM \pm SEM: 13.9 g/day \pm 2.18) and 5-10 years (LSM \pm SEM: 19.1 g/day \pm 2.53), both were significantly less than the consumption rate of children aged 10-15 years (LSM \pm SEM: 31.7 g/day \pm 3.08; $P < .01$) (Table 13j).

Table 13a-i. Comparisons within populations of total mean consumption in g/day by age/gender category. Mean values are controlled for weight and height, which are covariates that affect mean consumption. Least Squares Means are reported to account for differences in sample size (n) for each age/gender category. Significant differences of $P < .05$ are noted with an * and significant differences of $P < .01$ are noted with **. Means with the same letter superscripts are significantly different; those with different letter superscripts are not significantly different. Populations are not mutually exclusive.

a. General Population

	n	Mean Tot Oz /Day		Mean Tot Gm/Day		P
		LS Mean	+SEM	LS Mean	+SEM	
Children ≤ 15	72	0.9	0.24	26.0	6.74	NS
Women >15 & ≤ 45	89	1.3	0.18	37.0	5.02	NS
Women >45 and ≤ 65	53	0.9	0.23	25.7	6.41	NS
Men, 15 - 65	132	0.9	0.16	26.2	4.49	NS
Adults >65	67	0.9	0.20	24.1	5.75	NS

b. Sport Fishing Families

	n	Mean Tot Oz /Day		Mean Tot Gm/Day		P
		LS Mean	+SEM	LS Mean	+SEM	
Children ≤ 15	57	0.9 ^a	0.34	25.4 ^a	9.73	**
Women >15 & ≤ 45	83	1.5 ^c	0.28	43.6 ^c	7.96	*
Women >45 and ≤ 65	20	1.8 ^b	0.53	52.0 ^b	14.92	NS
Men, 15 - 65	257	2.2 ^{ac}	0.15	63.2 ^{ac}	4.20	
Adults >65	58	1.6 ^d	0.32	46.7 ^d	9.09	NS

c. Sport Fishing Families by Race

	n	Mean Tot Oz /Day		Mean Tot Gm/Day		P
		LS Mean	+SEM	LS Mean	+SEM	
Caucasian Sport Fishing Families	341	1.5 ^a	0.16	42.5 ^a	4.62	*
Minority Sport Fishing Families	133	2.0 ^a	0.23	57.7 ^a	6.63	*

d. Commercial Fishing Families

	n	Mean Tot Oz /Day		Mean Tot Gm/Day		P
		LS Mean	+SEM	LS Mean	+SEM	
Children ≤ 15	24	0.7	0.55	20.1	15.71	NS
Women >15 & ≤ 45	27	1.1	0.39	31.6	11.00	NS
Women >45 and ≤ 65	30	1.9	0.36	54.9	10.13	NS
Men, 15 - 65	65	2.1	0.29	58.3	8.16	NS
Adults >65	26	1.6	0.39	45.4	11.01	NS

e. Limited Income Families

	n	Mean Tot Oz /Day		Mean Tot Gm/Day		P
		LS Mean	+SEM	LS Mean	+SEM	
Children ≤ 15	297	1.1 ^a	0.17	32.4 ^a	4.78	**
Women >15 & ≤45	256	2.0 ^{adc}	0.15	56.8 ^{adc}	4.26	*
Women >45 and ≤65	52	2.1 ^{af}	0.30	58.8 ^{af}	8.52	
Men, 15 - 65	202	2.4 ^{acdgs}	0.16	68.7 ^{acdgs}	4.53	
Adults >65	49	1.5 ^{bc}	0.31	41.1 ^{bc}	8.65	*

f. Limited Income Families by Fishing Activity

	n	Mean Tot Oz /Day		Mean Tot Gm/Day		P
		LS Mean	+SEM	LS Mean	+SEM	
Limited Income Angler Families	157	2.1 ^a	0.18	59.0 ^a	5.06	**
Non-Angler Limited Income Families	699	1.6 ^a	0.10	44.1 ^a	2.97	**

g. Minority Families

	n	Mean Tot Oz /Day		Mean Tot Gm/Day		P
		LS Mean	+SEM	LS Mean	+SEM	
Children ≤ 15	226	1.3 ^a	0.18	37.4 ^a	5.20	**
Women >15 & ≤45	241	2.1 ^{ab}	0.15	60.8 ^{ab}	4.23	
Women >45 and ≤65	69	2.1 ^{ac}	0.25	59.6 ^c	7.09	
Men, 15 - 65	241	2.2 ^{ad}	0.14	62.6 ^{ad}	4.01	
Adults >65	24	1.9 ^c	0.41	54.9 ^c	11.54	

h. Southeast Asian Families

Southeast Asian Families	n	Mean Tot Oz /Day		Mean Tot Gm/Day		P
		LS Mean	+SEM	LS Mean	+SEM	
Children ≤ 15	62	1.3 ^a	0.27	35.8 ^a	7.65	
Women >15 & ≤45	87	2.6 ^{ab}	0.20	75.0 ^{ab}	5.53	**
Women >45 and ≤65	34	2.3 ^{ac}	0.30	63.9 ^{ac}	8.47	*
Men, 15 - 65	126	2.3 ^{ad}	0.17	64.5 ^{ad}	4.75	**
Adults >65	15	2.3 ^c	0.44	64.7 ^c	12.57	

i. Non-Southeast Asian Minority Families

	n	Mean Tot Oz /Day		Mean Tot Gm/Day		P
		LS Mean	+SEM	LS Mean	+SEM	
Children ≤ 15	164	1.5	0.26	41.7	7.37	NS
Women >15 & ≤45	154	1.7	0.22	47.9	6.29	NS
Women >45 and ≤65	35	1.8	0.39	50.6	11.06	NS
Men, 15 - 65	115	2.0	0.23	56.2	6.57	NS
Adults >65	9	1.2	0.72	34.4	20.46	NS

j. Children

	n	Mean Tot Oz /Day		Mean Tot Gm/Day		P
		LS Mean	+SEM	LS Mean	+SEM	
Children, 0 - <5	203	0.5 ^{ac}	0.08	13.9 ^{ac}	2.18	**
Children >5 and ≤10	144	0.7 ^{bd}	0.09	19.1 ^{bd}	2.53	**
Children >10 and ≤15	106	1.1 ^{ab}	0.11	31.7 ^{ab}	3.08	

E. Preparation and Cooking Practices

Exposure to contaminants in fish tissue can be minimized if certain precautions and measures are taken prior to cooking the fish. For example, fish species such as bluefish and striped bass can be trimmed to remove the skin and darker, fattier tissues where contaminants concentrate, and then broiled to allow the fat to drip away.

1. Trimming of Skin and Fatty Tissues

To document whether certain precautions are being taken to minimize exposure to possible contaminants, individuals were asked whether they trim the skin and fatty tissue from their fish prior to cooking and, if so, which fish species did they trim. One-third of the general population responded that they always trim fish, 18% trim certain fish and 28% never trim fish (Table 14). Among the sport fishing population, 43% always trim fish, 23% trim certain fish and 22% never trim fish. Only 19% of the minority population always trim fish, 17% trim certain fish species, and 50% never trim fish. Breaking the minority population into its two subsets, 61% of the Southeast Asians never trim their fish, while 28% trim certain species. More than 1/3 of the non-Southeast Asian minorities always trim their fish, while 41% never trim fish, and about 9% trim certain fish (Table 14).

The predominant species trimmed (Table 15) were bluefish, catfish and bullheads, flatfish, trout and striped bass. A comparison of the trimming frequency for non-commercial (locally-caught) fish species is illustrated in Figure 5.

2. Parts Eaten

Respondents were also asked to indicate which part(s) of each species they ate (Table 16), and the results for key recreational species are illustrated in Figure 6. The majority of individuals consumed only the muscle meat of fish, with smaller percentages consuming the skin and/or fins, and head. Minorities and limited income populations (many of which are probably the same individuals since the populations are not mutually exclusive) tend to eat more of the fish parts, as compared to the general population, which typically consumes only the meat. Lobster tomalley and blue crab mustard were also popular. A small percentage of individuals ate fish roe and eyes. The Southeast Asians were the most thorough consumers, utilizing in many cases the meat, skin/fins, head, bones, eyes, roe, and fat or oil of the fish, the latter adding flavor to the meal.

3. Cooking Practices

One of the purposes of the food record was to document cooking practice or methods for fish. However, because the food records were not used in the final analysis, cooking information by species is available for the Southeast Asian population only (Table 17). The most common cooking methods were broiling, poaching-boiling-steaming, sauté/stir fry, and deep frying. A lot of fish was smoked, and smaller percentages grilled or used in a soup or chowder. Cooking methods did not vary much from typically-recognized practices.

F. Non-Commercial Fishing Practices

1. Fishing Activity in Connecticut Waters

One of the focus areas of this study was to examine the fishing and consumption patterns of sport, cultural and subsistence fishermen in Connecticut. The goal was to examine primarily saltwater activities, however, freshwater activities are also included in the results. Individuals were asked if they ever fish in Connecticut fresh waters, and do they ever consume those locally-caught fish, and if they ever

Table 14. Breakdown of individual responses by population to question of trimming fish prior to cooking. Populations include two subsets of minority population, Southeast Asians, and non-Southeast Asian minorities. Populations are not mutually exclusive.

Variable	General Population		Sport Fishing Families		Commercial Fishing Families		Minority Families		Limited Income Families		Women >15 and < 45		Children < 15		Southeast Asian Families		Non-Southeast Asian Minority Families		
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	
Trim fat/ skin from fish																			
Caught		437		492		172		774		805		464		418		329			445
Always	32.95	144	43.29	213	46.51	80	19.38	150	30.19	243	36.42	169	34.69	145	0.61	2	33.26	148	
Never	27.69	121	22.36	110	12.79	22	49.61	384	37.76	304	33.41	155	34.93	146	61.09	201	41.12	183	
Certain Fish	18.08	79	22.76	112	37.79	65	17.05	132	14.04	113	14.66	68	12.20	51	27.96	92	8.99	40	
Sometimes	---	---	4.07	20	---	---	3.75	29	3.23	26	1.08	5	2.87	12	6.38	21	1.80	8	
Buy fillets only; don't eat fish needing trimming	11.21	49	2.85	14	---	---	6.46	50	9.69	78	7.97	37	9.57	40	3.04	10	8.99	40	

Table 15. Percent of fish trimmed prior to cooking by population. Populations are not mutually exclusive, and include two subsets of minority population.

Variable	General Population N= 63		Recreational Angling Families N= 92		Commercial Fishing Families N= 67		Minority Families N= 126		Low Income Families N= 107		Women >15 and < 45 N= 58		Children < 15 N= 47		Southeast Asian Families N = 101		Non-SE Asian Minorities N = 25	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Bass, Striped	12.70	8	15.22	14	22.39	15	---	---	3.74	4	6.90	4	6.38	3	---	---	---	---
Bass, unspecified	3.17	2	11.96	11	10.45	7	5.56	7	6.54	7	3.45	2	6.38	3	---	---	28.00	7
Blackfish / Tautog	7.94	5	9.78	9	19.40	13	3.97	5	4.67	5	8.62	5	4.26	2	1.98	2	12.00	3
Bluefish	26.98	17	38.04	35	73.13	49	12.70	16	16.82	18	29.31	17	21.28	10	6.93	7	36.00	9
Bullheads / Catfish	1.59	1	32.61	30	44.78	1	55.56	70	40.19	43	34.48	20	29.79	14	69.31	70	---	---
Carp	---	---	4.35	4	---	---	8.73	11	9.35	10	1.72	1	4.26	2	10.89	11	---	---
Cod / Scrod	28.57	18	9.78	9	2.99	2	5.56	7	4.67	5	10.34	6	4.26	2	---	---	28.00	7
Eel	3.17	2	2.17	2	---	---	---	---	4.67	2	---	---	---	---	---	---	---	---
Flounder / Fluke / Sole	19.05	12	20.65	19	38.81	26	---	---	11.21	12	12.07	7	4.26	2	---	---	---	---
Haddock	3.17	2	---	---	2.99	2	---	---	---	---	1.72	1	4.26	2	---	---	---	---
Halibut	1.59	1	1.09	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Mackerel	3.17	2	1.09	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Porgy / Scup	4.76	3	6.52	6	---	---	3.17	4	4.67	2	3.45	2	---	---	1.98	2	8.00	2
Salmon	31.75	20	8.70	8	---	---	5.56	7	7.48	8	12.07	7	14.89	7	6.93	7	---	---
Shad	---	---	1.09	1	2.99	1	3.97	5	4.67	5	---	---	---	---	4.95	5	---	---
Smelt	6.35	4	1.09	1	---	---	---	---	---	---	3.45	2	4.26	2	---	---	---	---
Sunfish / Bluegills / Pumpkinsseeds	---	---	2.17	2	---	---	4.76	6	5.61	6	1.72	1	2.13	1	5.94	6	---	---
Swordfish	17.46	11	2.17	2	5.97	4	3.17	4	3.74	4	8.62	5	29.79	14	---	---	16.00	4
Trout, unspecified	6.35	4	22.83	21	7.46	5	23.02	29	24.30	26	18.97	11	23.40	11	28.71	29	---	---
Tuna, fresh	3.17	2	1.09	1	5.97	4	---	---	0.93	1	1.72	1	---	---	---	---	---	---
Whiting, unspecified	3.17	2	1.09	1	---	---	5.56	7	6.54	7	5.17	3	4.26	2	---	---	28.00	7

Figure 5. Breakdown of non-commercial fish species (recreational catches) trimmed prior to cooking by population, where y axis reflects number of individuals that trim. Populations are not mutually exclusive.

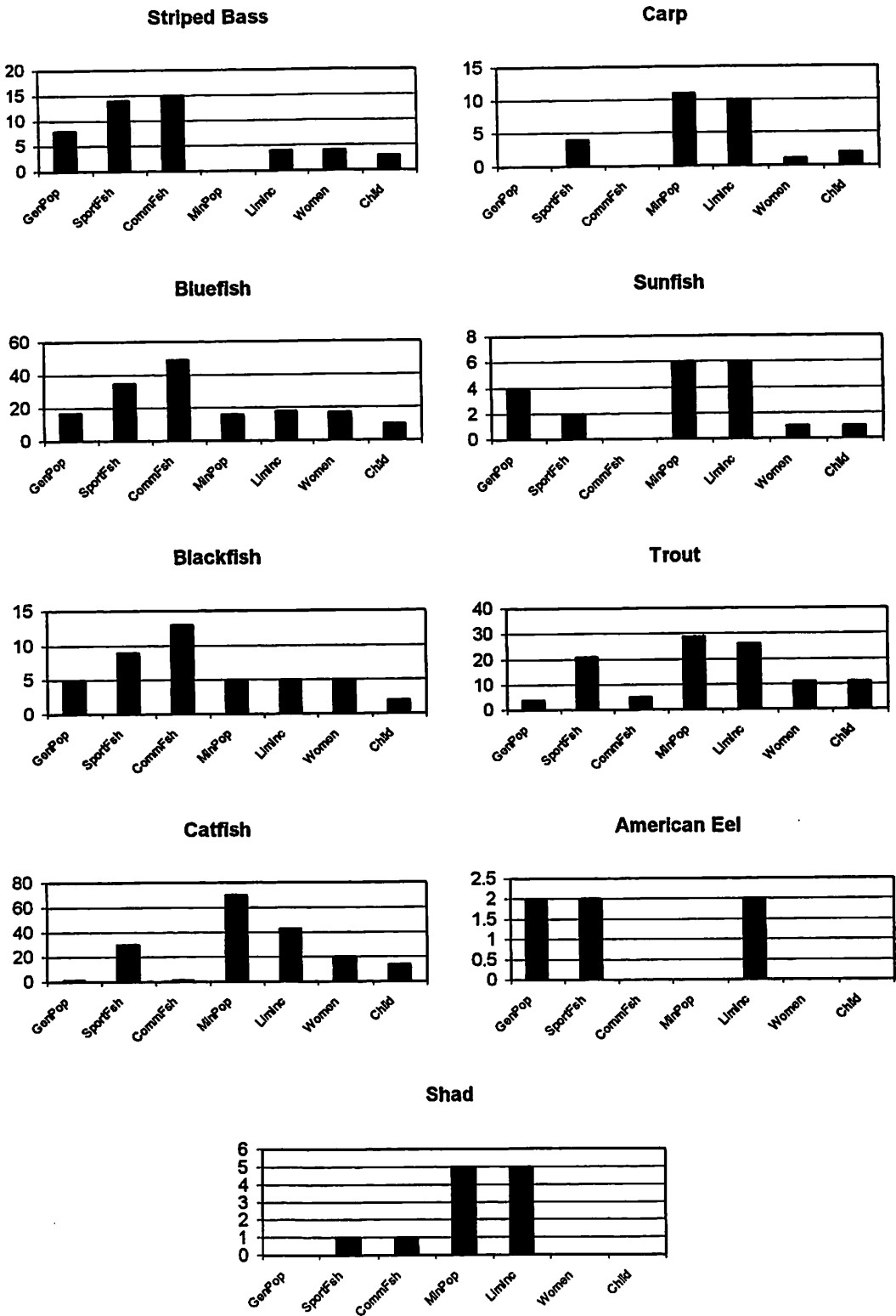


Table 16. Parts of fish and crustaceans eaten, by species and population. Percent of population is given, with n in parentheses. Populations are not mutually exclusive.

Species	General	Sport Fishing	Commercial Fishing	Limited Income	Minority	SE Asians	Non-Asian Minorities	Women	Children
FRSHWATER									
LM Bass									
Entire Fish	---	5.9 (1)	---	20.0 (1)	---	---	---	50.0 (1)	---
Meat	---	82.4 (14)	100.0 (2)	80.0 (4)	60.0 (3)	---	60.0 (3)	50.0 (1)	---
Skin/Fins	---	11.8 (2)	---	---	40.0 (2)	---	40.0 (2)	---	---
Head	---	---	---	---	---	---	---	---	---
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	---	---	---	---	---	---	---	---
Roe/Eggs	---	---	---	---	---	---	---	---	---
Fat/Oil	---	---	---	---	---	---	---	---	---
SM Bass									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	100.0 (4)	64.3 (9)	100.0 (2)	38.9 (14)	36.8 (14)	35.3 (12)	50.0 (2)	43.8 (7)	57.1 (4)
Skin/Fins	---	21.4 (3)	---	33.3 (12)	36.8 (14)	35.3 (12)	50.0 (2)	25.0 (4)	42.9 (3)
Head	---	14.3 (2)	---	25.0 (9)	23.7 (9)	26.5 (9)	---	25.0 (4)	---
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	---	---	---	---	---	---	---	---
Roe/Eggs	---	---	---	2.8 (1)	2.6 (1)	2.9 (1)	---	6.3 (1)	---
Fat/Oil	---	---	---	---	---	---	---	---	---
Bass, unspec.									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	---	65.0 (39)	---	50.0 (20)	34.2 (27)	34.0 (16)	34.4 (11)	38.1 (8)	47.4 (9)
Skin/Fins	---	26.7 (16)	---	25.0 (5)	30.4 (24)	31.9 (15)	28.1 (9)	33.3 (7)	42.1 (8)
Head	---	5.0 (3)	---	25.0 (5)	24.1 (19)	25.5 (12)	21.9 (7)	23.8 (5)	10.5 (2)
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	---	---	---	10.1 (8)	6.4 (3)	15.6 (5)	4.8 (1)	---
Roe/Eggs	---	1.7 (1)	---	---	1.3 (1)	2.1 (1)	---	---	---
Fat/Oil	---	1.7 (1.0)	---	---	---	---	---	---	---
Carp									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	---	56.7 (17)	---	45.5 (20)	51.6 (33)	51.8 (29)	50.0 (4)	61.9 (13)	42.9 (3)
Skin/Fins	---	---	---	---	---	---	---	---	---
Head	---	26.7 (8)	---	31.8 (14)	29.7 (19)	26.8 (15)	50.0 (4)	28.6 (6)	28.6 (2)
Bones	---	---	---	---	---	---	---	---	28.6 (2)
Eyes	---	---	---	9.1 (4)	6.3 (4)	7.1 (4)	---	---	---
Roe/Eggs	---	6.7 (2)	---	---	3.1 (2)	3.6 (2)	---	4.8 (1)	---
Fat/Oil	---	10.0 (3)	---	13.6 (6)	9.4 (6)	10.7 (6)	---	4.8 (1)	---
Catfish									
Entire Fish	4.2 (2)	---	---	---	0.8 (2)	---	2.9 (2)	1.9 (2)	---
Meat	79.2 (38)	80.0 (60)	85.7 (18)	59.2 (77)	61.4 (153)	57.8 (104)	71.0 (49)	65.7 (69)	66.7 (30)
Skin/Fins	6.3 (3)	9.3 (7)	4.8 (1)	17.7 (23)	22.5 (56)	23.3 (42)	20.3 (14)	19.0 (20)	24.4 (11)
Head	6.3 (3)	8.0 (6)	4.8 (1)	14.6 (19)	10.4 (26)	12.8 (23)	4.3 (3)	8.6 (9)	8.9 (4)
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	1.3 (1)	4.8 (1)	3.1 (4)	2.0 (5)	2.2 (4)	1.4 (1)	1.0 (1)	---
Roe/Eggs	4.2 (2)	1.3 (1)	---	5.4 (7)	2.8 (7)	3.9 (7)	---	3.8 (4)	---
Fat/Oil	---	---	---	---	---	---	---	---	---

Table 16 continued.

Species	General	Sport Fishing	Commercial Fishing	Limited Income	Minority	SE Asians	Non-Asian Minorities	Women	Children
White Perch									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	100.0 (2)	59.5 (22)	---	43.3 (26)	43.0 (46)	42.3 (30)	44.4 (16)	47.5 (19)	50.0 (6)
Skin/Fins	---	27.0 (10)	---	35.0 (21)	34.6 (37)	36.6 (26)	30.6 (11)	32.5 (13)	41.7 (5)
Head	---	13.5 (5)	---	21.7 (13)	22.4 (24)	21.1 (15)	25.0 (9)	20.0 (8)	8.3 (1)
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	---	---	---	---	---	---	---	---
Roe/Eggs	---	---	---	---	---	---	---	---	---
Fat/Oil	---	---	---	---	---	---	---	---	---
Yellow Perch									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	100.0 (3)	72.2 (13)	---	63.6 (14)	63.6 (14)	---	63.6 (14)	46.2 (6)	80.0 (4)
Skin/Fins	---	22.2 (4)	---	18.2 (4)	18.2 (4)	---	18.2 (4)	30.8 (4)	20.0 (1)
Head	---	5.6 (1)	---	18.2 (4)	18.2 (4)	---	18.2 (4)	23.1 (3)	---
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	---	---	---	---	---	---	---	---
Roe/Eggs	---	---	---	---	---	---	---	---	---
Fat/Oil	---	---	---	---	---	---	---	---	---
Perch, unspec.									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	90.0 (9)	81.8 (18)	---	100.0 (5)	---	---	---	80.0 (4)	100.0 (4)
Skin/Fins	---	18.2 (4)	---	---	---	---	---	---	---
Head	---	---	---	---	---	---	---	---	---
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	---	---	---	---	---	---	---	---
Roe/Eggs	10.0 (1)	---	---	---	---	---	---	20.0 (1)	---
Fat/Oil	---	---	---	---	---	---	---	---	---
Pickrel									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	---	81.8 (18)	---	100.0 (1)	---	---	---	50.0 (1)	50.0 (1)
Skin/Fins	---	18.2 (4)	---	---	---	---	---	50.0 (1)	---
Head	---	---	---	---	---	---	---	---	50.0 (1)
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	---	---	---	---	---	---	---	---
Roe/Eggs	---	---	---	---	---	---	---	---	---
Fat/Oil	---	---	---	---	---	---	---	---	---
Sunfish unspec.									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	100.0 (5)	44.0 (48)	---	42.8 (83)	43.0 (111)	43.0 (11)	50.0 (1)	43.5 (30)	30.3 (10)
Skin/Fins	---	27.5 (30)	---	36.1 (70)	38.8 (100)	38.7 (99)	50.0 (1)	39.1 (27)	18.2 (6)
Head	---	11.0 (12)	---	10.3 (20)	7.8 (20)	7.8 (20)	---	8.7 (6)	21.2 (7)
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	3.7 (4)	---	2.1 (4)	1.6 (4)	1.6 (4)	---	1.4 (1)	6.1 (2)
Roe/Eggs	---	10.1 (11)	---	5.7 (11)	4.3 (11)	4.3 (11)	---	2.9 (2)	18.2 (6)
Fat/Oil	---	3.7 (4)	---	3.1 (6)	4.7 (12)	4.7 (12)	---	4.3 (3)	6.1 (2)

Table 16 continued.

Species	General	Sport Fishing	Commercial Fishing	Limited Income	Minority	SE Asians	Non-Asian Minorities	Women	Children
Trout unspec.									
Entire Fish	1.6 (1)	---	---	---	0.4 (1)	---	1.7 (1)	---	---
Meat	91.8 (56)	77.2 (166)	90.0 (18)	65.7 (111)	57.3 (141)	52.7 (98)	71.7 (43)	67.8 (78)	75.4 (46)
Skin/Fins	3.3 (2)	16.3 (35)	10.0 (2)	18.3 (31)	23.6 (58)	25.3 (47)	18.3 (11)	17.4 (20)	19.7 (12)
Head	1.6 (1)	5.6 (12)	---	12.4 (21)	15.4 (38)	17.7 (33)	8.3 (5)	11.3 (13)	4.9 (3)
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	---	---	---	---	---	---	---	---
Roe/Eggs	1.6 (1)	---	---	1.8 (3)	1.2 (3)	1.6 (3)	---	1.7 (2)	---
Fat/Oil	---	0.9 (2)	---	1.8 (3)	2.0 (5)	2.7 (5)	---	1.7 (2)	---
Whitesucker									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	---	50.0 (5)	---	50.0 (4)	46.2 (6)	50.0 (4)	40.0 (2)	42.9 (3)	---
Skin/Fins	---	50.0 (5)	---	50.0 (4)	46.2 (6)	50.0 (4)	40.0 (2)	42.9 (3)	---
Head	---	---	---	---	7.7 (1)	---	20.0 (1)	14.3 (1)	---
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	---	---	---	---	---	---	---	---
Roe/Eggs	---	---	---	---	---	---	---	---	---
Fat/Oil	---	---	---	---	---	---	---	---	---
SALTWATER									
Striped Bass									
Entire Fish	---	1.1 (2)	---	---	---	---	---	1.5 (1)	2.6 (1)
Meat	95.6 (43)	84.5 (147)	96.7 (89)	70.9 (61)	61.2 (52)	38.7 (12)	74.1 (40)	77.6 (52)	86.8 (33)
Skin/Fins	2.2 (1)	10.3 (18)	1.1 (1)	19.8 (17)	25.9 (22)	35.5 (11)	20.4 (11)	13.4 (9)	7.9 (3)
Head	2.2 (1)	3.4 (6)	1.1 (1)	9.3 (8)	10.6 (9)	22.6 (7)	3.7 (2)	6.0 (4)	2.6 (1)
Bones	---	0.6 (1)	---	---	---	---	---	---	---
Eyes	---	---	1.1 (1)	---	1.2 (1)	---	1.9 (1)	---	---
Roe/Eggs	---	---	---	---	1.2 (1)	3.2 (1)	---	1.5 (1)	---
Fat/Oil	---	---	---	---	---	---	---	---	---
Blackfish									
Entire Fish	5.0 (1)	---	---	2.0 (2)	2.7 (3)	---	6.7 (3)	3.6 (2)	---
Meat	95.0 (19)	73.0 (119)	95.8 (91)	57.1 (56)	45.5 (51)	34.3 (23)	62.2 (28)	60.0 (33)	72.4 (21)
Skin/Fins	---	15.3 (25)	2.1 (2)	21.4 (21)	25.9 (29)	31.3 (21)	17.8 (8)	18.2 (10)	13.8 (3)
Head	---	9.8 (16)	1.1 (1)	19.4 (19)	23.2 (26)	31.3 (21)	11.1 (5)	14.5 (8)	13.8 (4)
Bones	---	0.6 (1)	---	---	---	---	---	---	---
Eyes	---	---	1.1 (1)	---	0.9 (1)	---	2.2 (1)	---	---
Roe/Eggs	---	0.6 (1)	---	---	0.9 (1)	1.5 (1)	---	1.8 (1)	---
Fat/Oil	---	0.6 (1)	---	---	0.9 (1)	1.5 (1)	---	1.8 (1)	---
Bluefish									
Entire Fish	1.2 (1)	---	---	1.0 (2)	0.9 (3)	---	2.1 (3)	1.6 (2)	---
Meat	98.8 (81)	68.8 (176)	93.5 (72)	59.7 (117)	47.6 (152)	32.4 (57)	66.4 (95)	62.2 (79)	68.4 (54)
Skin/Fins	---	17.2 (44)	2.6 (2)	18.9 (37)	23.5 (75)	28.4 (50)	17.5 (25)	15.0 (19)	16.5 (13)
Head	---	7.4 (19)	1.3 (1)	13.3 (26)	19.4 (62)	24.4 (43)	13.3 (19)	12.6 (16)	12.7 (10)
Bones	---	2.0 (5)	---	---	1.3 (4)	2.3 (4)	---	0.8 (1)	2.5 (2)
Eyes	---	---	2.6 (2)	---	0.3 (1)	---	0.7 (1)	---	---
Roe/Eggs	---	2.3 (6)	---	2.0 (4)	3.1 (10)	5.7 (10)	---	5.5 (7)	---
Fat/Oil	---	2.3 (6)	---	5.1 (10)	3.8 (12)	6.8 (12)	---	2.4 (3)	---

Table 16 continued.

Species	General	Sport Fishing	Commercial Fishing	Limited Income	Minority	SE Asians	Non-Asian Minorities	Women	Children
Flounder/Fluke									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	95.6 (129)	74.1 (218)	97.6 (83)	36.6 (155)	33.1 (231)	28.8 (147)	44.9 (84)	47.1 (122)	49.7 (87)
Skin/Fins	3.7 (5)	12.2 (36)	---	24.5 (104)	27.1 (189)	27.6 (141)	25.7 (48)	20.8 (54)	21.1 (37)
Head	0.7 (1)	3.4 (10)	---	9.2 (39)	11.3 (79)	11.6 (59)	10.7 (20)	8.5 (22)	6.9 (12)
Bones	---	---	1.2 (1)	---	---	---	---	---	---
Eyes	---	1.4 (4)	---	3.1 (13)	1.9 (13)	2.5 (13)	---	1.5 (4)	1.1 (2)
Roe/Eggs	---	8.8 (26)	1.2 (1)	21.9 (93)	21.4 (149)	23.7 (121)	15.0 (28)	17.4 (45)	16.0 (28)
Fat/Oil	---	---	---	4.7 (20)	5.2 (36)	5.7 (29)	3.7 (7)	4.6 (12)	5.1 (9)
Mackerel									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	100.0 (9)	27.0 (27)	100.0 (3)	25.9 (112)	26.7 (172)	25.8 (149)	34.3 (23)	27.1 (56)	27.4 (32)
Skin/Fins	---	22.0 (22)	---	23.6 (102)	25.2 (162)	25.0 (144)	26.9 (18)	24.6 (51)	26.5 (31)
Head	---	21.0 (21)	---	22.2 (96)	23.3 (150)	22.9 (132)	26.9 (18)	23.7 (49)	18.8 (22)
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	5.0 (5)	---	5.1 (22)	3.7 (24)	4.2 (24)	---	3.4 (7)	6.0 (7)
Roe/Eggs	---	20.0 (20)	---	18.1 (78)	17.1 (110)	17.7 (102)	11.9 (8)	16.4 (34)	17.1 (20)
Fat/Oil	---	5.0 (5)	---	5.1 (22)	4.0 (26)	4.6 (26)	---	4.8 (10)	4.3 (5)
Porgy									
Entire Fish	---	---	4.0 (1)	---	0.2 (1)	---	0.6 (1)	---	---
Meat	100.0 (14)	59.7 (77)	96.0 (24)	43.1 (129)	44.2 (201)	29.4 (86)	71.0 (115)	49.7 (73)	50.5 (52)
Skin/Fins	---	17.1 (22)	---	26.1 (78)	26.2 (119)	29.4 (86)	20.4 (33)	22.4 (33)	20.4 (21)
Head	---	10.9 (14)	---	16.7 (50)	17.1 (78)	22.9 (67)	6.8 (11)	15.6 (23)	11.7 (12)
Bones	---	0.8 (1)	---	0.3 (1)	0.2 (1)	---	0.6 (1)	---	---
Eyes	---	3.1 (4)	---	2.7 (8)	1.8 (8)	2.7 (8)	---	1.4 (2)	3.9 (4)
Roe/Eggs	---	4.7 (6)	---	7.0 (21)	6.8 (31)	10.2 (30)	0.6 (1)	8.2 (12)	7.8 (8)
Fat/Oil	---	3.9 (5)	---	4.0 (12)	3.5 (16)	5.5 (16)	---	2.7 (4)	5.8 (6)
Shad									
Entire Fish	---	---	---	---	---	---	---	---	---
Meat	77.8 (7)	40.0 (2)	85.7 (12)	36.1 (13)	39.7 (25)	28.1 (9)	51.6 (16)	68.8 (11)	45.5 (5)
Skin/Fins	11.1 (1)	---	---	11.1 (4)	28.6 (18)	12.5 (4)	45.2 (14)	25.0 (4)	36.4 (4)
Head	11.1 (1)	20.0 (1)	---	25.0 (9)	15.9 (10)	28.1 (9)	3.2 (1)	6.3 (1)	18.2 (2)
Bones	---	---	---	---	---	---	---	---	---
Eyes	---	20.0 (1)	---	13.9 (5)	7.9 (5)	15.6 (5)	---	---	---
Roe/Eggs	---	20.0 (1)	14.3 (2)	13.9 (5)	7.9 (5)	15.6 (5)	---	---	---
Fat/Oil	---	---	---	---	---	---	---	---	---
Blue Crab									
Entire Fish	---	1.2 (3)	1.6 (2)	---	---	---	---	---	---
Meat	99.0 (103)	78.2 (194)	88.8 (111)	64.3 (222)	59.5 (292)	49.0 (172)	85.7 (120)	72.2 (153)	76.4 (84)
Head	---	---	0.8 (1)	---	0.2 (1)	---	0.7 (1)	---	---
Eyes	---	0.8 (2)	0.8 (1)	0.6 (2)	0.6 (3)	0.6 (2)	0.7 (1)	---	---
Roe/Eggs	---	1.6 (4)	1.6 (2)	1.7 (6)	1.2 (6)	1.7 (6)	---	1.4 (3)	---
Mustard	1.0 (1)	18.1 (45)	6.4 (8)	32.5 (112)	37.9 (186)	47.9 (168)	12.9 (18)	26.4 (56)	21.8 (24)
Organs	---	---	---	0.9 (3)	0.6 (3)	0.9 (3)	---	---	1.8 (2)
Lobster									
Entire Fish	0.5 (2)	0.4 (2)	2.0 (5)	---	---	---	---	0.2 (1)	---
Meat	91.5 (345)	81.8 (392)	82.7 (210)	86.6 (420)	77.0 (382)	48.4 (60)	86.6 (322)	87.4 (360)	88.6 (186)
Head	0.3 (1)	0.6 (3)	0.8 (2)	0.2 (1)	2.8 (14)	3.2 (4)	2.7 (10)	1.2 (5)	0.5 (1)
Roe/Eggs	2.9 (11)	4.8 (23)	6.7 (17)	0.4 (2)	0.4 (2)	---	0.5 (2)	2.2 (9)	1.4 (3)
Tomalley	4.7 (18)	12.3 (59)	7.9 (20)	12.8 (62)	19.8 (98)	48.4 (60)	10.2 (38)	9.0 (37)	9.5 (20)

Figure 6. The parts of non-commercial fish species, lobsters and crabs that are eaten by population, where y axis reflects number of individuals. Populations are not mutually exclusive.

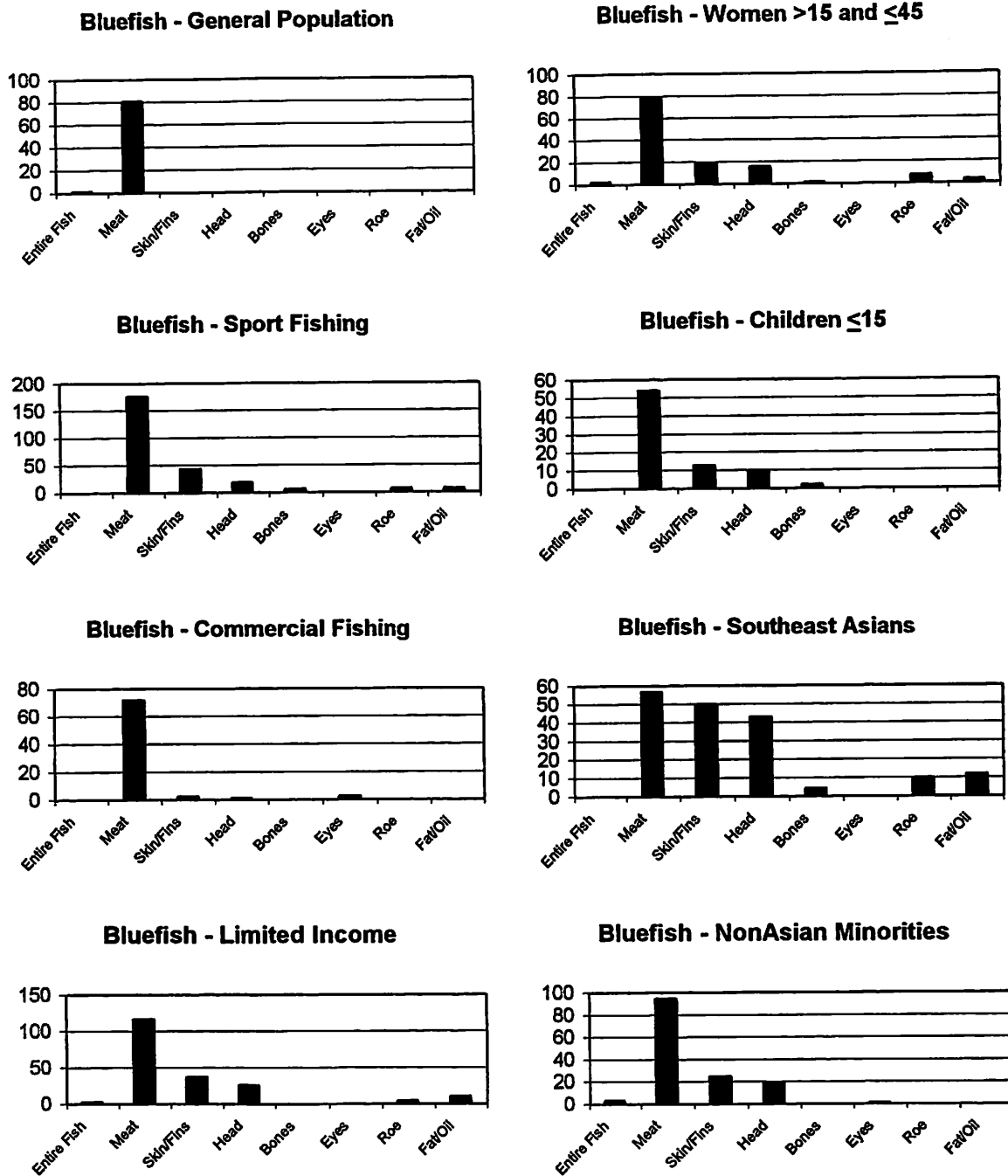
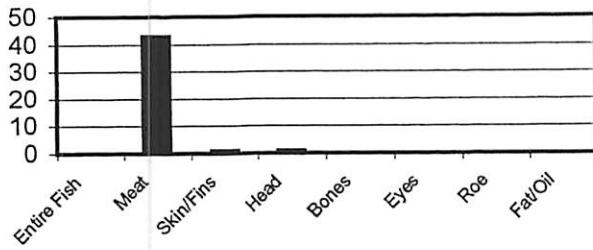
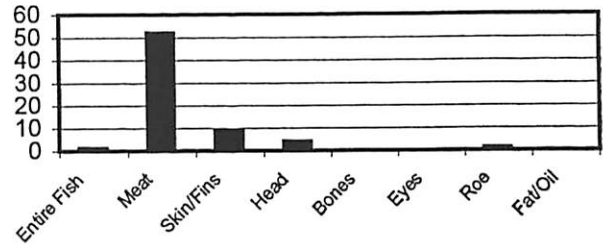


Figure 6 continued.

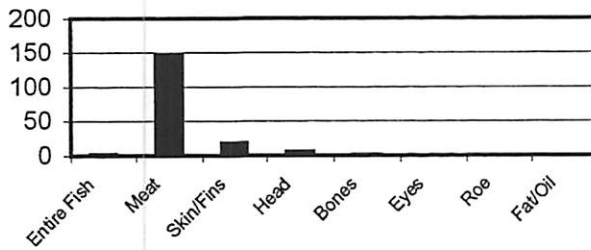
Striped Bass - General Population



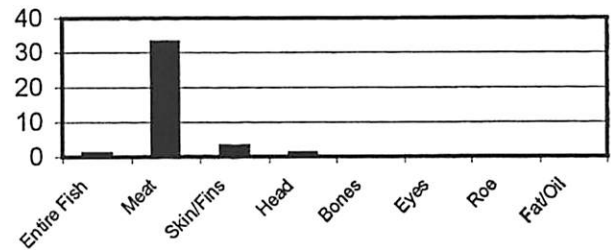
Striped Bass - Women >15 & ≤45



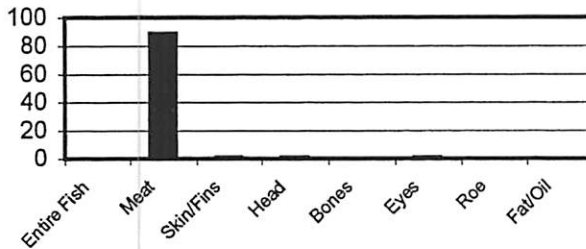
Striped Bass - Sport Fishing



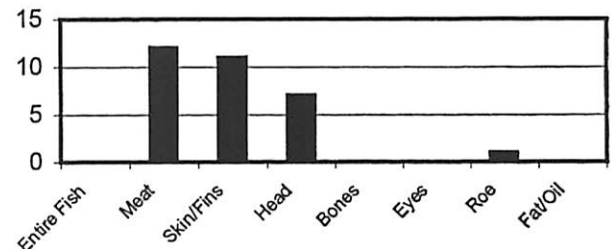
Striped Bass - Children ≤15



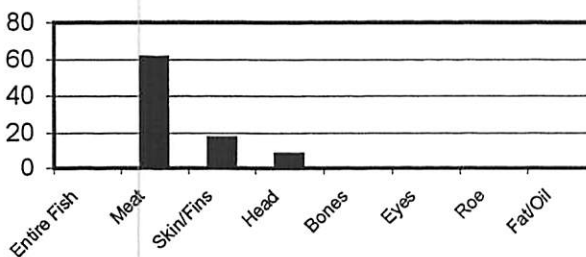
Striped Bass - Commercial Fishing



Striped Bass - Southeast Asians



Striped Bass - Limited Income



Striped Bass - NonAsian Minorities

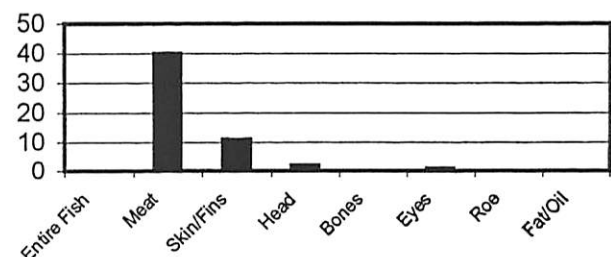


Figure 6 continued.

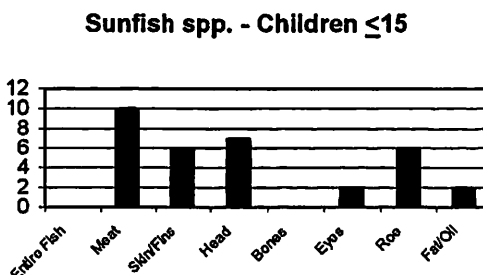
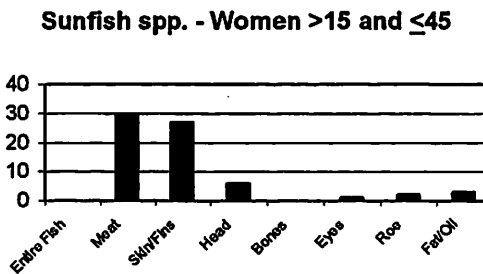
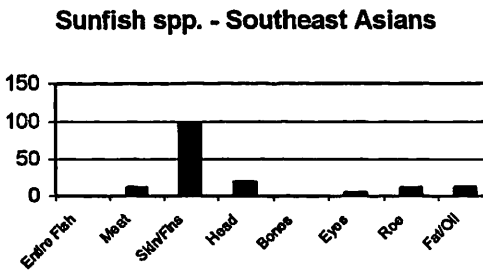
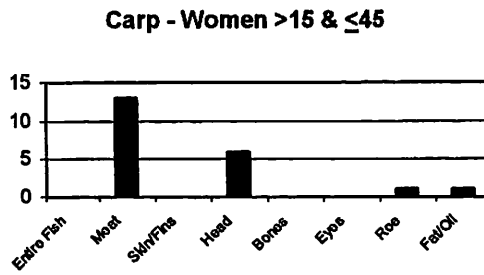
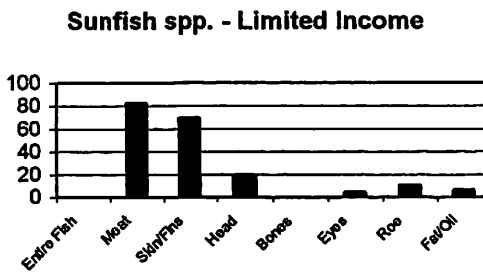
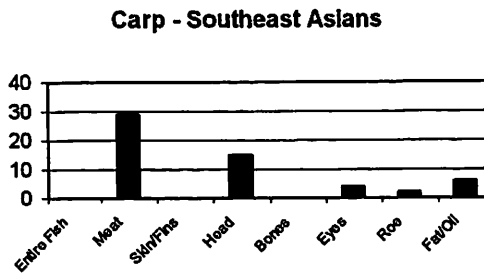
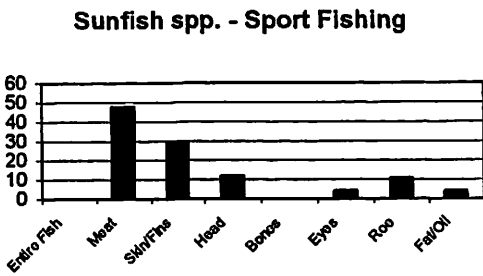


Figure 6 continued.

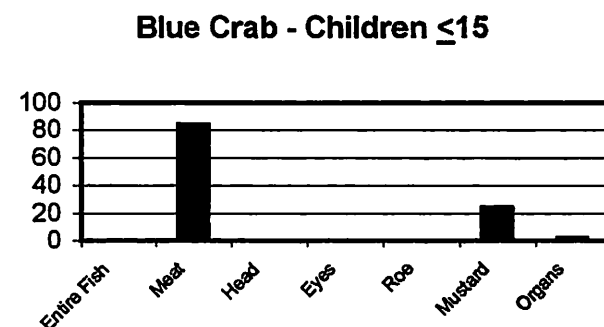
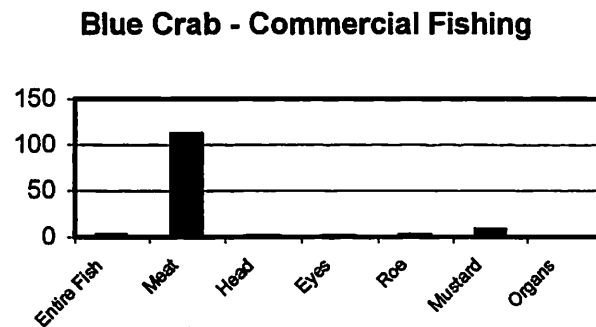
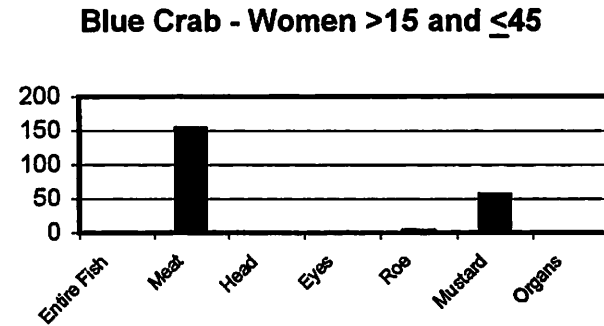
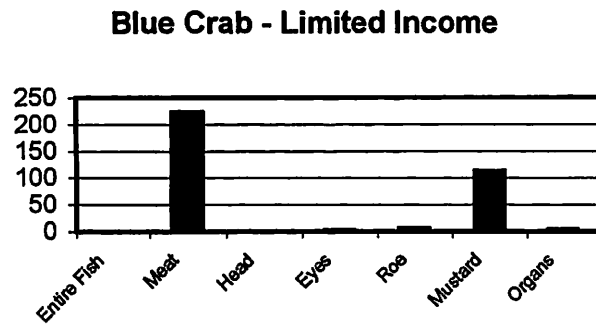
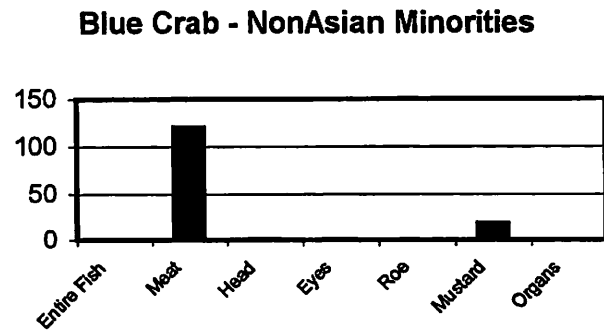
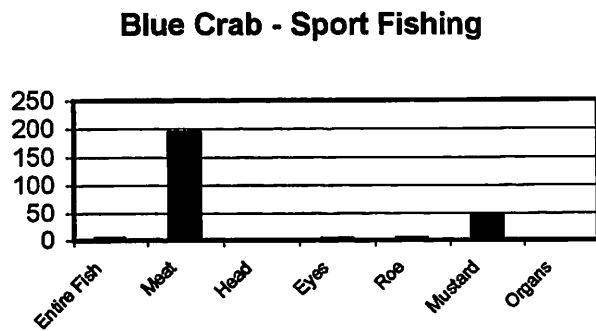
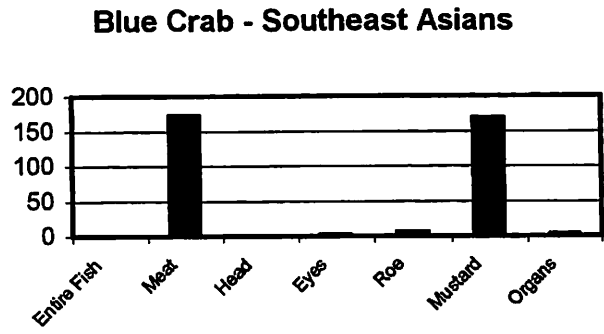
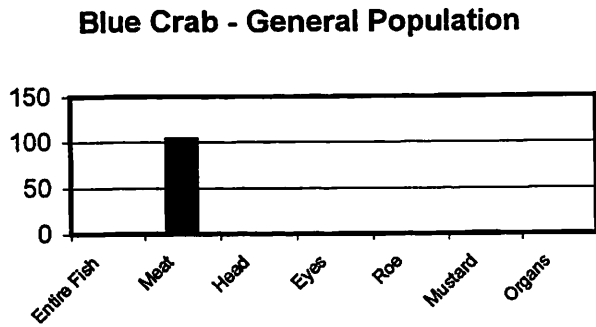


Figure 6 continued.

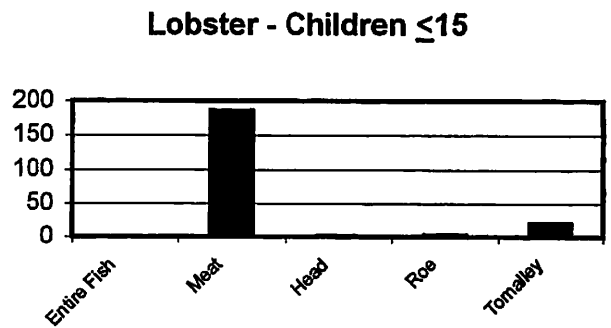
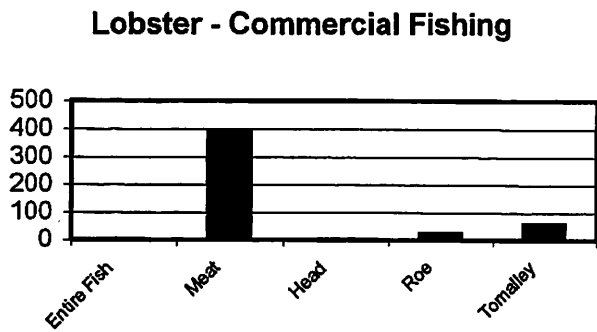
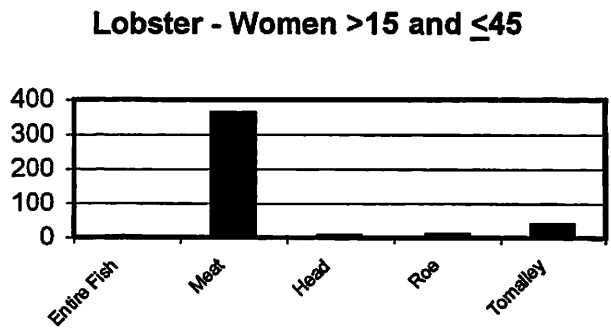
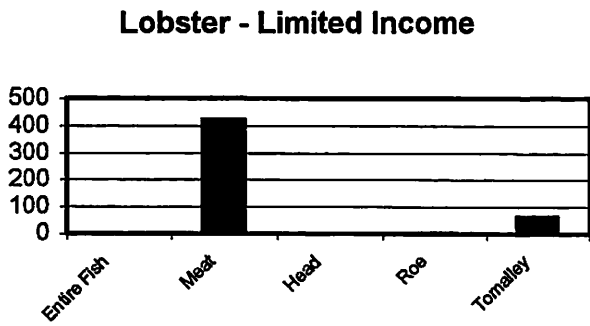
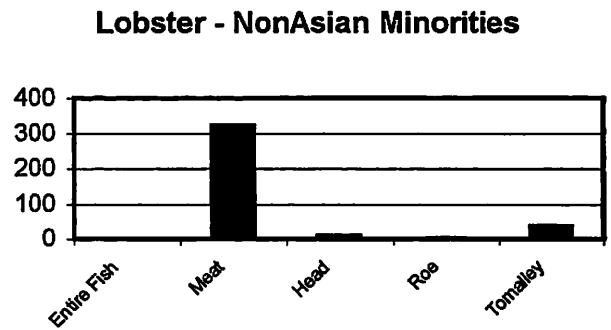
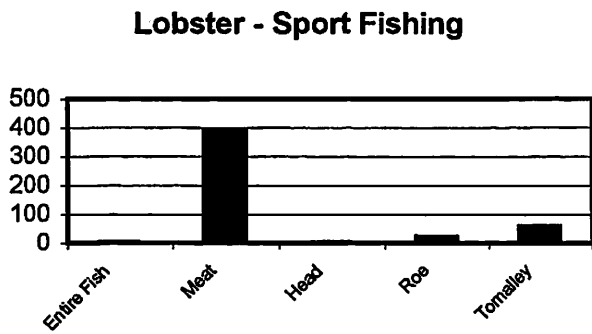
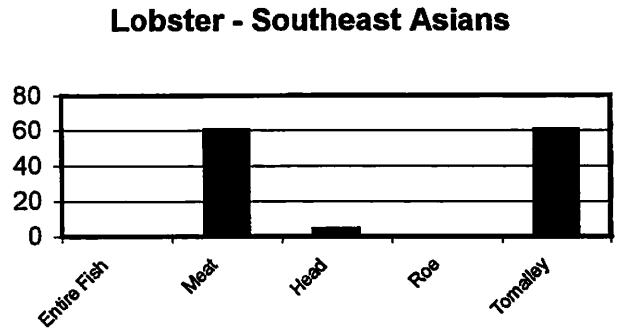
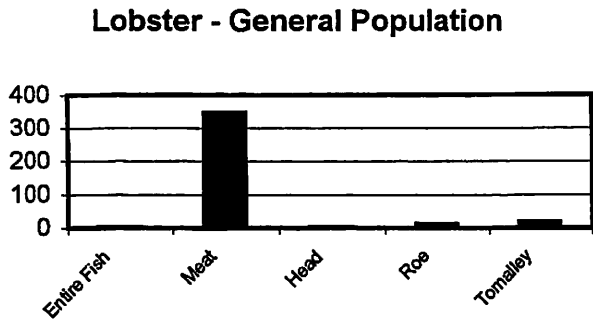


Table 17. Description of typical cooking methods for fish cooked in Southeast Asian households, by species. Data is presented as percentages with number of responses in parentheses. Not included in the table are flounder in sandwiches or salads (4 responses, 0.6%), blue crab in soupstock (161 responses, 32.8%), and lobsters cooked in the microwave (45 responses, 25.0%).

Species	Broiled	Poach / Boil / Steam	Sautéed / Stir-fry	Deep Fry	Smoked	Grilled	Soup / Chowder / Stew / Casserole / Bisque
SM Bass	20.0 (1)	20.0 (1)	20.0 (1)	20.0 (1)	20.0 (1)	---	---
Striped Bass	28.6 (12)	28.6 (12)	16.7 (7)	19.0 (8)	7.1 (3)	---	---
Bass, unspec.	22.6 (14)	22.6 (14)	22.6 (14)	22.6 (14)	4.8 (3)	---	4.8 (3)
Bluefish	24.0 (49)	21.6 (44)	19.6 (40)	21.6 (44)	4.9 (10)	---	8.3 (17)
Blackfish	26.1 (23)	23.9 (21)	23.9 (21)	23.9 (21)	1.1 (1)	---	1.1 (1)
Carp	24.1 (28)	15.5 (18)	21.6 (25)	21.6 (25)	1.7 (2)	8.6 (10)	6.9 (8)
FW Catfish	39.7 (94)	22.8 (54)	10.1 (24)	22.8 (54)	3.0 (7)	1.7 (4)	---
Flounder	19.3 (134)	18.7 (130)	17.1 (119)	18.3 (127)	17.4 (121)	3.9 (27)	4.7 (33)
Mackerel	19.4 (134)	19.4 (134)	18.8 (130)	17.1 (118)	14.3 (99)	6.1 (42)	5.1 (35)
Nrthrn Pike	26.9 (14)	26.9 (14)	19.2 (10)	26.9 (14)	---	---	---
White Perch	28.6 (26)	28.6 (26)	18.7 (17)	24.2 (22)	---	---	---
Porgy	22.3 (73)	22.3 (73)	19.2 (63)	20.4 (67)	8.5 (28)	2.4 (8)	4.9 (16)
Shad	22.0 (9)	9.8 (4)	22.0 (9)	22.0 (9)	12.2 (5)	12.2 (5)	---
Sunfish, ssp.	27.8 (102)	25.6 (94)	13.4 (49)	24.0 (88)	3.0 (11)	3.0 (11)	3.3 (12)
Trout	27.7 (91)	24.3 (80)	20.7 (68)	22.2 (73)	1.8 (6)	1.8 (60)	1.5 (5)
Whitefish	24.4 (39)	24.4 (39)	24.4 (39)	24.4 (39)	---	---	2.5 (4)
Whiting / Kingfish	25.0 (22)	25.0 (22)	25.0 (22)	25.0 (22)	---	---	---
Blue Crab	32.8 (161)	---	1.2 (6)	---	1.0 (5)	32.2 (158)	---
Lobster	25.0 (45)	---	25.0 (45)	---	---	25.0 (45)	---

fish or shellfish in Long Island Sound, and do they ever consume those fish or shellfish. To differentiate between recreational fish and commercial fish, all households with at least one person who fishes in either fresh or salt water in Connecticut, or consumes fish caught by someone (other family member, friend) were included in the sport fishing household population. No commercial fishing households were included in this category. Cultural and subsistence fishing activities were also examined, using the fishing households in the limited income and minority populations (Table 18). Additional questions were asked about the frequency of the fishing activities.

More than 77% of the individuals included in the sport fishing household population fish in Connecticut's lakes, ponds and rivers, while 62% fish in Long Island Sound (Table 18). Seventy percent indicated eating the freshwater fish caught, while 80% ate the saltwater fish caught. These percentages

include those who may not have actually been fishing, but had eaten fish caught by family members or friends.

More than one-third of commercial fishing household members fish in fresh water too, but these individuals were not added to the sport fishing population in an effort to keep the two populations distinctly separate.

A larger percentage of limited income and minority household members fish in fresh water rather than Long Island Sound, but consumption rate was high for both fresh and saltwater locally-caught fish (between 76% and 86% consume locally-caught fish) (Table 18). Fishing activity and consumption rates of locally-caught fish were greater for Southeast Asians than non-Southeast Asian minorities, for both saltwater and freshwater species. While economic need may play a role in the amount of fishing activity, it is predominantly a cultural desire to consume very fresh fish that appears to lead to fishing activity, at least in this study. However, less fishing activity was documented than actually occurs. Ms. Nguyen felt that many individuals would not admit to fishing, because they did not have the proper license, but often stated that they received locally-caught fish from “friends”. However, another comment made by one of the individuals interviewed was that he was “not aware of many Asians who have time to fish. Everyone is too busy working to go”.

2. Frequency of Fishing Activities

The frequency of fishing activity varied widely, from “never” to daily (Table 18). For all populations except for sport fishing and commercial fishing, more than 80% of those surveyed did not fish in either fresh water or salt water. Infrequent fishing trips, 1-6 per year, were taken by 10% of the general population, 8% of the minority population (including 13% of Southeast Asians and 5% of the Non-Asian minorities), 8% of the limited income household members and children, and 11% of the women of childbearing age. The majority of individuals fish infrequently, 1-12 times per year. Among the sport fishermen, 30% fished 1 to 6 times per year, 33% fished >6 to 12 times per year, and 24% fished >1 to 3

times per week. Ten percent fished 3 or more times per week. Commercial fishing activity was broadly distributed.

3. Fishing Locations

Fishing locations were sought to determine to what extent fishing activities were occurring in water bodies known to be contaminated (Appendix 19). Freshwater bass were caught throughout the state, as were yellow and white perch. The Connecticut River was popular for catfish and perch. The Connecticut River, Farmington River, Salmon River and Candlewood Lake were most popular for trout, while carp were caught in the Connecticut River by a number of Southeast Asians, pickerel were caught in Dodge Pond by someone in the limited income population, and walleye were caught in Cedar Lake and Gardner Lake.

On the saltwater side (including commercial fishing activities), striped bass were caught all over Long Island Sound, including the mouth of the Connecticut River, Niantic Bay, Ocean Beach and the mouth of the Thames River (Appendix 19). Popular bluefish spots included the Sound overall, The Race, Ocean Beach, Niantic Bay and River, Seaside Park, and New Haven Harbor. Specific blackfish sites in the Sound were New Haven Harbor, Niantic Bay and River, The Race, Seaside Park, and Ocean Beach. The mouths of the Connecticut and Housatonic Rivers were popular among flounder / flatfish fishermen, along with Niantic Bay/River, Fisher's Island Sound, New Haven Harbor, Ocean Beach, and Rocky Neck State Park. Porgy were also caught in Niantic Bay and River, New Haven Harbor, Seaside Park, Stonington Harbor, and Duck Island. The survey tool included a number of questions about individual fishing habits, and consumption habits for fish locally-caught in both salt water and fresh water.

During interviews with Southeast Asians, some difficulty was encountered in identifying fishing locations, because often the anglers followed directions to a location but did not know the name of the water body and in some cases, even the towns, they fished in. To help identify the species of fish, a booklet of drawings was compiled, so that survey participants could point to fish resembling the ones caught. This worked well for the most part, however, there were some dubious identifications, including

those for “whitefish,” which in reality may be river herring or white perch (Hyatt, personal communication).

4. Awareness of Fish Consumption Advisories

Household awareness of and compliance with the State of Connecticut-issued fish consumption advisories were assessed. For these questions alone, responses were included from all surveys returned, both complete and incomplete. The household and individual demographics for this larger population is provided in Appendices 20 and 21, respectively.

The answers to the fish consumption advisory questions are provided in Table 19. The results show that even non-seafood eaters recognize that eating fish is a healthy practice. In terms of awareness of the fish consumption advisories, less than half (47%) of the general population was aware of them, compared to 63% of the sport fishing families and 81% of the commercial fishing families. Minority and limited income families exhibited the least awareness of the advisories, dropping to 31% and 37% respectively. Less than 17% of Southeast Asian households interviewed were aware of the advisories, even though they have been posted in Vietnamese, Laotian, Cambodian, and Hmong. Many of the fish species they like to consume, including carp from the Connecticut River and bluefish and striped bass from Long Island Sound, are listed in the advisories. About 37% of the non-Southeast Asian minority households were aware of the advisories. Women of childbearing age and children reside in households of which 39% and 42%, respectively, are aware of the advisories (Table 19).

Of those households that eat seafood, more than half (57%) of the general population, 64% of the minority and 63% of the limited income households did not know if the advisories applied to the fish they ate. Almost half (47%) of the commercial fishing households and a third of the sport fishing households did know to which fish the advisories applied. Less than 15% of the households with women of childbearing age or children knew which fish species the advisories cover (Table 19).

Table 18. Breakdown of individual fishing activity and related consumption for fresh and saltwater species by population. Populations are not mutually exclusive. Consumption includes those individuals who ate fish caught by family members or friends. Two subsets of minority population (Southeast Asians and non-Southeast Asian minorities) are also given.

Variable	General Population		Sport Fishing Families		Commercial Fishing Families		Minority Families		Limited Income Families		Women >15 and ≤ 45		Children ≤ 15		Southeast Asian Families		Non-Southeast Asian Minority Families	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Fish in Connecticut fresh waters	9.84	43	77.38	390	35.03	62	14.30	123	15.80	148	13.88	69	10.91	61	20.67	68	10.36	55
Consume freshwater Catches	50.00	38	69.88	283	87.64	78	85.89	207	76.00	190	76.74	99	65.05	67	97.35	147	68.18	60
Fish / shellfish in LIS	6.64	29	61.90	312	70.06	124	5.82	50	7.58	71	10.26	51	6.62	37	7.60	25	4.71	25
Consume fish / shellfish Catches	68.12	47	80.00	264	96.88	155	80.20	81	80.51	95	81.63	80	77.27	51	84.00	42	79.59	39
How Often Fishes		435		471		172		829		917		483		550		309		520
Never	84.37	367	6.58	31	30.23	52	84.68	702	81.03	743	79.71	385	85.45	470	80.58	249	87.12	453
1 - 6 times / year	9.89	43	30.15	142	12.79	22	7.60	63	8.29	77	10.87	53	8.00	44	12.62	39	4.62	24
6+ -12 times / year	3.68	16	32.61	136	17.88	32	4.58	38	5.49	51	5.38	26	2.73	15	4.85	15	4.42	23
1 - 3 times / week	2.07	9	23.99	113	33.72	58	2.53	21	3.38	37	3.93	19	3.64	20	1.94	6	2.88	15
3+ - 5 times / week	---	---	6.37	30	5.23	9	0.48	4	0.55	5	---	---	0.18	1	---	---	0.77	4
5+ times /week	---	---	4.03	19	1.74	3	0.12	1	0.44	4	---	---	---	---	---	---	0.19	1

With the exception of sport fishing households (33%) and commercial fishing households (45%), less than 30% of the population households were knowingly following the fish consumption advisories. The majority just didn't know if they were following the advisories or not (Table 19).

Few reasons were given for not following the advisories, but the responses included not eating enough to make a difference, not wanting to waste fish, feeling that the advisories always change, and being unfamiliar with the advisories. Several households stated they were unconcerned about the advisories, or that they did not apply to the fish they ate (Table 19).

When asked if they knew where to get more information on the advisories, 47% of the sport fishing households and 53% of the commercial fishing households said "yes." Only 17% of the minority households, 19% of the limited income households, and 27% of the general population households indicated they knew where to get this information. In each population group, a smaller percentage of households aware of the advisories knew where to get more information about them. This indicates a general lack of knowledge of which agencies issue the advisories, or that people are aware of the advisories' existence, but do not know exactly what they are, or do not understand their meaning (Table 19).

The responses may have been clearer if only those answering "yes" to the awareness of the advisories question had been prompted to answer the following two questions on whether or not the advisories applied to the fish eaten and whether or not they followed the advisories. The way the questions were phrased, households having not awareness of the advisories continued on to answer the remainder of the questions, resulting in a higher number of "don't knows".

Nevertheless, it appears that even among sport fishing households, a greater awareness of the fish consumption advisories is needed. While awareness of the advisories is quite low among the minority and limited income households, cultural desires for fresh fish or the economic need to supply food may override any concerns about the consumption of potentially-contaminated fish.

Table 19. Household responses to fish consumption advisory questions by population. Populations are not mutually exclusive.

Variable	General Population		Sport Fishing Families		Commercial Fishing Families		Minority Families		Limited Income Families		Women >15 and ≤ 45		Children ≤ 15		Southeast Asian Families		Non-SE Asian Minority Families	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Aware eating fish is healthy		215		345		74		278		275		426		309		90		188
Yes	96.28	207	65.51	226	97.30	72	76.26	212	85.82	236	93.19	377	91.59	283	88.89	80	70.21	132
No	2.79	6	2.32	8	1.35	1	7.91	22	8.36	23	5.40	23	6.47	20	6.67	6	8.51	16
Aware of State of CT fish consumption advisories		215		345		74		278		275		426		309		90		188
Yes	46.98	101	62.61	216	81.08	60	30.58	85	37.09	102	39.31	170	42.07	130	16.67	15	37.23	70
No	53.02	114	35.94	124	18.92	14	69.06	192	62.55	172	60.09	256	57.93	179	83.33	75	62.23	117
Aware if advisories apply to fish eaten*		201		340		74		272		264		407		227		90		182
Yes	13.43	27	33.24	113	47.30	35	9.19	25	10.23	27	12.18	51	14.54	33	4.44	4	11.54	21
No	25.37	51	25.59	87	25.68	19	20.59	56	28.03	74	28.34	112	26.87	61	6.67	6	27.47	50
Don't know	57.21	115	32.35	110	25.68	19	63.60	173	57.97	153	57.61	236	55.95	127	87.78	79	51.65	94
Follows advisories*		198		328		74		266		264		407		225		90		178
Yes	29.29	58	33.54	110	44.59	33	17.29	46	22.73	60	25.55	104	28.44	64	5.62	5	23.03	41
Somewhat	11.11	22	14.63	48	28.38	21	3.01	8	6.44	17	7.13	29	8.89	20	1.12	1	3.93	7
No	10.61	21	11.28	37	10.81	8	9.40	25	11.74	31	10.57	43	8.44	19	1.12	1	13.48	24
Don't know	45.96	91	26.52	87	14.86	11	61.65	164	54.55	144	52.83	215	50.02	113	88.76	79	47.75	85
Reasons for not following Advisories**		138		227		41		214		203		309		161		84		129
Do not eat enough to make a difference	0.72	1	1.76	4	---	---	0.47	1	1.45	3	0.65	2	0.62	1	---	---	0.78	1
Do not like wasting fish	---	---	0.88	2	---	---	0.47	1	---	---	0.32	1	---	---	1.19	1	---	---
Advisories always change	0.72	1	0.44	1	---	---	0.47	1	0.49	1	0.32	1	0.62	1	---	---	0.78	1
Eating fish whole life without adverse effect	---	---	1.32	3	---	---	---	---	0.49	1	---	---	---	---	---	---	---	---
Fish caught in clean deep sea	---	---	0.44	1	---	---	0.47	1	0.49	1	0.32	1	0.62	1	1.19	1	---	---
Unfamiliar with advisories	21.01	29	10.13	23	9.76	4	12.15	26	23.15	47	21.04	65	22.98	37	---	---	20.16	26
Unconcerned about advisories	0.72	1	5.29	12	7.32	3	0.93	2	1.45	2	1.62	5	0.62	1	---	---	0.78	2
Advisories do not apply to fish eaten	10.14	14	9.25	21	4.88	2	4.21	9	3.94	8	5.18	16	5.59	9	1.19	1	6.20	8
Eat in restaurants	---	---	---	---	2.44	1	---	---	---	---	---	---	---	---	---	---	---	---
Knows where to get more information about the advisories		215		345		74		278		275		426		309		90		187
Yes	26.98	58	46.96	162	52.70	39	16.55	46	18.55	51	22.30	95	30.39	63	7.78	7	20.86	39
No	68.84	148	50.14	173	47.30	35	78.42	218	73.82	203	73.71	314	75.40	233	91.11	82	68.98	129

*Responses from seafood eaters only.

**Responses for seafood eaters only, minus the ones already following the advisories

G. Availability of Locally-Harvested Seafood

One of the objectives of this project was to determine the amount of seafood from Long Island Sound that is sold and/or served in Connecticut. The results illustrated the difficulty in tracking the source and disposal of seafood.

1. Harvesters

One survey was mailed to a randomly chosen subset of 225 harvesters finfish, shellfish and lobsters licensed by Connecticut DEP and the Connecticut Department of Agriculture, Bureau of Aquaculture. Of these, 17 were returned by individuals who only fished for personal use, or did not harvest seafood in Long Island Sound. Ten others were undeliverable. The final response rate was 22.2% (44 responses). Of those harvesters responding to the survey, 68.2% sold some or all of their Long Island Sound catches in Connecticut. The responses for all questions were for the 1996 calendar year.

The species harvested ranged from lobster to American eel (Table 20). The majority of the catches were sold to wholesalers or dealers, who may have then sold and shipped the seafood out of state (Table 21). Seafood retailers, restaurants and the general public were also sold seafood harvested from Long Island Sound. Harvesters were also asked which of the species they harvest from Long Island Sound did they sell in Connecticut and the responses are shown in Table 22. Lobster topped the list, followed by whelks, clams, blackfish, oysters and bluefish.

Table 20. Commercial species harvested in Long Island Sound and surrounding waters during the 1996 calendar year.

Species	Percent
Lobster	29.2
Blackfish	11.5
Bluefish	10.6
Clams	8.8
Flounder / Fluke	7.1
Porgy	5.3
Whelk / Conch	5.3
Oysters	2.7
Blue Crabs	2.7
Tuna	2.7
Mussels	0.9
American Eel	0.9

Table 21. Breakdown of types of operations to which the harvesters sold their catches from Long Island Sound and surrounding waters during 1996. Harvesters could name more than one, and percentages reflect multiples answers.

Sold To	Percent
Wholesaler / Dealer	50.8
Seafood Retailer	29.8
Restaurant	13.2
General Public	6.2

Table 22. Species harvested in Long Island Sound and surrounding waters that were sold in Connecticut during 1996.

Species	Percent
Lobster	52.6
Whelk / Conch	10.5
Clams	8.8
Blackfish	7.0
Oysters	5.3
Bluefish	3.5
Porgy	3.5
Flounder / Fluke	1.8
Tuna	1.8

Finally, the harvesters were asked to indicate by species, the percent of their total harvest that was sold in Connecticut, and the number of pounds of fish or shellfish that was sold (Table 23). Some of the harvesters were not able to provide this information, and the responses from those who did varied widely. For example, only two harvesters sold bluefish, but they sold 100% of their total 1996 catch in Connecticut, between 200 and 10,000 pounds. Between 5% and 100% of the total 1996 lobster harvest was sold in Connecticut, ranging from 168 pounds to 70,000 pounds of lobsters. Oysters exhibited a similar range of percent sold in Connecticut, 5% - 100%.

2. Retailers, Distributors, Restaurants

Seafood retailers, distributors, and restaurants were also surveyed to determine what percentage of seafood sold or served was from Long Island Sound, and what species were most commonly sold or served. The second survey was mailed to 225 seafood retailers, distributors, and restaurants in

Connecticut. Of these, 11 came back undeliverable, and forty-one (19.2%) usable surveys were returned. All answers are tied to the 1996 calendar year.

The types of operations responding to the survey included wholesalers (36.3%), restaurants (23.5%), retailers (35.1%), and caterers (5.1%). The respondents were asked if they purchased, sold or served any seafood harvested from Long Island Sound during 1996. The results (Table 24) indicate that 26% of the restaurants, 11% of the retailers and 9% of the wholesalers do not know the source of the seafood they sell or serve. This is most likely because seafood purchases are commonly made from wholesaler, dealers, distributors, food brokers or importers, and infrequently directly from the harvester. However, 50% of the wholesalers, 66% of the retailers, and 44% of the restaurants responding to the survey did purchase, sell or serve seafood from Long Island Sound and surrounding waters in Connecticut. The species sold or served in Connecticut harvested from Long Island Sound or surrounding waters were predominantly lobster, hard clams, oysters and bluefish (Table 25). Finally, the respondents were asked to indicate the percent of the total amount of a species they purchase that definitely comes from Long Island Sound and surrounding waters, and the amount that percentage represents in pounds (Table 26). The mean percentages ranged from 100% of bluefish and flounder purchased, to 36% of the lobsters, to 55% of the oysters.

Table 23. Breakdown of percent and quantity in pounds of total 1996 catch harvested in Long Island Sound and surrounding waters during 1996 sold in Connecticut.

Species Sold	n	Mean Percent of Total Catch Sold in CT	Range of Percent Sold	Mean Pounds Sold	Range, Pounds Sold
Bluefish	2	100.0	---	5,100	200 - 10,000
Blackfish	4	87.5	50 - 100	1,341	15 - 5,000
Flounder/Fluke	1	100.0	---	1,000	---
Porgy	2	100.0	---	495	300 - 1,000
Tuna	1	100.0	---	5,000	---
Hard Clams	5	39.5	5 - 95	---	---
Lobster	30	72.5	5 - 100	9,818	168 - 70,000
Oysters	3	66.7	5 - 100	45,000	---
Whelk / Conch	6	100.0	---	2,325	50 - 6,000

Table 24. Breakdown of responses to question on whether or not seafood harvested from Long Island Sound and surrounding waters was purchased, sold or served.

Operation	Percent Response		
	Yes	No	Don't Know
Wholesaler	50.0	41.2	8.8
Retailer	65.5	23.8	10.6
Restaurant	43.6	30.7	25.7
Repacker/Reship	---	100.0	---
Caterer	100.0	---	---
Food Broker	---	100.0	---
Importer	---	100.0	---

Table 25. Long Island Sound species sold or served by Connecticut wholesalers, restaurants and retailers.

Species	Percent
Lobster	38.5
Hard Clams	25.6
Oysters	15.4
Bluefish	10.3
Shad	5.1
Flounder / Fluke	2.6
Scallops	2.6

Table 26. The percent of the total amount purchased of certain species that came from Long Island Sound and the number of pounds sold or served for calendar year 1996.

Species	n	Mean Percent of Total Purchase from LIS	Range of Percent of Total Purchased	Mean Pounds Sold / Served	Range, Pounds Sold / Served
Bluefish	4	100.0	---	426	5 - 1,000
Flounder/ Fluke	1	100.0	---	1,200	---
Shad	2	55.0	10 - 100	153	5 - 300
Hard Clams	10	45.9	3 - 100	25,185	600 - 120,000
Lobster	15	35.8	5 - 100	32,878	60 - 200,000
Oysters	6	54.8	2 - 100	5,436	360 - 12,000
Scallops	1	100.0	---	1,200	---

V. Conclusions

Connecticut residents consume significantly more fish and seafood per year on average than is consumed nationally, regardless of whether the consumption rate is compared to a value of 14.3 gm/day or 6.5 gm/day. While the nine populations were not mutually exclusive and therefore could not be compared statistically, distinct differences in consumption rates and behaviors are evident between the populations, as well as among the populations, based on the age and gender categories.

The general population's consumption rate is almost twice that of the national average, but is comparative if the 14.3 gm/day value was derived from a national population including the mid-west, where seafood is consumed at a lower rate due to reduced access. The higher risk groups, such as Southeast Asians and sport fishing families, consume fish and seafood at a rate approaching more than four times the national average. Only children under the age of 15 consume fish and seafood at a rate approaching the national average, however that rate (18.3gm/day) is still significantly different from 14.3 gm/day.

There are many reasons why seafood consumption rates are high in Connecticut. It is a coastal state, and reasonably priced seafood is available locally year-round. Fishing in both fresh and salt water is a popular past-time in Connecticut, whether it is undertaken primarily for fun or as a source of food to supplement limited incomes. Among the Southeast Asians, a desire for really fresh fish can prompt fishing activity as well.

Although this study focuses in large part on lower income households, Connecticut is also a wealthy state overall, leading the nation in per capita income. Connecticut residents can afford to buy seafood or eat out at seafood restaurants.

An increase in fish and seafood consumption is also attributable to health concerns. Over the past decade or more, health professionals have been touting fish and seafood as a means to lower cholesterol and fat intake. As a result, this health-conscious population is eating fish and chicken more often than other types of meat, on their own, or at the advice of health care professionals and nutritionists. In that

regard, it may well be that nationally, fish and seafood consumption rates are higher than the values currently in use by state and federal agencies, since the study from which the 14.3 g/day consumption rate was derived was conducted in the 1970s, prior to the push to increase the amount of fish and seafood in our diets for health reasons. It is assumed that the missing study from which the 6.5 g/day consumption rate was derived was also conducted more than two decades ago.

Average meal size for both "caught" and bought" fish was less than the currently used eight ounces, and varied by population. In the case of meals of fish bought in a store or at a restaurant, the meal size approached the more standard 3-ounce serving prescribed by nutritionists, ranging from 3 to 5 ounces, perhaps due to economical reasons. "Caught" fish meals tended to be slightly larger, ranging from 4 to 7 ounces. These servings may be bigger for several reasons. Sport-caught fish are essentially free, and the respondents perhaps feel less constrained to consume only small portions. Several telephone calls were made to individuals listing 85-ounce meals of striped bass or bluefish, to confirm the validity of these amounts. It was possible in some of these cases, to do so, and in others, it was not. The larger portion sizes may be due to overestimates of portion sizes, however, the consistent use of the food portion visuals should have eliminated this as a factor. It appears then, that using an eight-ounce meal size in the risk assessment calculation is conservative.

Because of these greater than average consumption rates, and the types of fish being consumed in Connecticut (including bluefish, striped bass, and freshwater species like carp), the populations we considered to be at higher potential risk to exposure to contaminants, are indeed at greater risk. A large percentage of the population is taking some precautions such as trimming the skin and fatty tissues before cooking, however, the average meal size per time of fish caught usually exceeded the size of any purchased fish/seafood meal. Furthermore, populations advised not to consume bluefish and striped bass (such as women of childbearing age and young children) are still consuming these fish on a frequent basis.

Awareness and compliance with the state-issued fish consumption advisories is quite low among the higher-risk groups, with the exception of the commercial fishing families. Awareness of the advisories was expected to be greater among the sport fishermen, because the advisories are listed in the annual anglers' guide, however, only 63% acknowledged awareness of them. Language barriers, cultural preferences and a readily available food source contribute to the very low awareness of and compliance with the advisories among the minority and limited income populations.

This study tried in a small way, to determine the amount of seafood harvested locally that is available to consumers through retail markets and restaurants. Unlike shellfish which remain tagged with their origin from the harvester to the consumer, it is difficult to track fish and other seafood which may be shipped to Boston or New York from Connecticut and then shipped back into the state. As a result, restaurant owners/chefs, and retail operators may not know where the fish or seafood come from, unless they buy it directly from a harvester. Connecticut residents can purchase seafood harvested from Long Island Sound in a retail market or restaurant, but the greater percentage of local fish and seafood is eaten as the result of recreational fishing activities.

This project surveyed households and included all members of that household in the population. Logistically, there was no way to meet the necessary sample sizes for each population within this study without including entire households. This method of inclusion raises the questions of statistical interdependence. While we agree that there is some interdependence within a household in terms of the tendency to eat (or not eat) fish and seafood, there is no dependence between individuals. We found that while most members ate the same species, the portion sizes were different, depending on age and/or gender. The data documents this. In terms of potential risk of exposure to contaminated fish, this interdependence can be important. For example, in a family where one person is an avid fisherman and brings home a lot of striped bass, the frequency in which striped bass is consumed by the family is much greater than in families where no one fishes. The risk of exposure to contaminants can be greater to some members of a family more than others (children, pregnant women).

Another concern about this type of survey, particularly with a low percent return rate for the general population mail survey, is whether or not the responses received accurately reflect the total population's behavior. Did this survey in fact attract returns from households that consume seafood on a more frequent basis? Or, because of the length and complexity of the survey, do the returns reflect more households that eat seafood infrequently? What role, if any, did the \$5.00 gift certificate incentive play? We did not address these questions formally, but do have some limited indication that general population surveys included in this study does reflect the total population sampled.

During the first half of the study, telephone calls were placed to each household about 7-10 days after the survey packages were mailed, to answer any questions and encourage participation. More than 1,650 telephone calls were made. For the most part, the interviewer encountered answering machines, or empty houses. On the occasions when someone actually answered the phone (about 15% of the time), the interviewer tried to determine if the household was planning to fill out the forms, and if not, why not. Of the households providing this information, 58.4% were not interested and had thrown the survey away, 15.4% indicated the survey was too long and they were too busy, 10.1% found the survey too hard, 6% named health problems or age as a factor, 3.4% indicated they did not eat seafood, and another 5.4% ate seafood less than five times a year. Less than 2% needed the Spanish version (which were subsequently mailed but never returned), and 24.4% said they already had or were planning to fill out and return the survey.

Some household members were asked how often he/she eats seafood and the responses (n=66) were as follows: 9.1% never eat seafood, 12.1% eat seafood 1 to 6 times per year, 15.1% eat 6+ to 12 meals per year, 13.6% eat 1+ to 2 meals per month, 10.6% have 2+ to 3 meals per month, 18.2% have 1+ to 2 meals per week, 12.1% have 2+ to 3 meals per week, 7.6% have 3+ to 5 meals per week and 1.5% have a daily meal of seafood. These responses are very similar to those provided by the general population (Table 9), with the exception of two instances. The percentage of people consuming one to two meals of fish or seafood per week was twice as high among the general population than it was among those

informally surveyed over the telephone, and 12% of those surveyed by telephone consumed 1-6 meals per year, while no one in the general population fell into that category. This may indicate a slightly higher tendency among survey respondents to eat seafood more frequently, however, in terms of representing non-seafood eaters, there was concurrence that 9-10% of both populations did not eat fish or seafood at all.

There was little indication of the effect the \$5.00 gift certificate had on the type of households returning the surveys, although it undoubtedly played a role in the return rate. We received returns from a wide range of income levels, and a wide range of households (non-seafood eaters, low level seafood consumers, moderate consumers and extensive consumers). If seafood-eating households returned incomplete forms, a gift certificate was not sent until the household was contacted and the missing information provided.

West *et al.* (1991) calculated a non-response bias adjustment for sport anglers of 2.2 g/day. If we were to factor this adjustment into our totals, the results would still be the same. If we assume that the food frequencies overestimate consumption rates by as much as 20% (Block, 1982; Elmstahn *et al.*, 1966), the results, with perhaps the exception of the children's consumption rate, would have been largely the same. These overestimates in food frequencies are usually for commonly eaten foods, which for many families, does not include fish or seafood.

This study provides extensive documentation of fish and seafood consumption practices and patterns for the general population of the Connecticut as well as eight other populations considered potentially at higher risk of exposure to contaminants in some species of fish and seafood. The results of this study provide detailed evidence that Connecticut residents consume fish and seafood at a rate that greatly exceeds U.S. estimates currently used in risk assessment calculations.

References

- Anon. 1995. Connecticut 1995 MFRSS Master Site Register. June 20, 1995.
- Anon. 1992. Marine Recreational Fishery Statistics Survey, Atlantic and Gulf Coasts, 1991. Current Fisheries Statistics No. 9204. US DOC, NOAA, NMFS. September . 2pp.
- Armbruster, G., K.L. Gall, W.H. Gutenmann, and D.J. Lisk. 1989. Effects of trimming and cooking by several methods on polychlorinated biphenyls (PCBs) residues in bluefish. *J. Food Saf.* 9:235-244.
- Arneson, P. The Minnesota Nutrition Data System, NDS93, Version 2.9 . 1988. Nutrition Coordinating Center, University of Minnesota.
- Barry, T. 1998. CT Department of Environmental Protection. Personal communication.
- Barry, T.A., C.M. Capacchione, H-J. Hsu and J. Vu. 1993. Subsistence fishing in Connecticut: the impact on Southeast Asians. Yale University School of Medicine, Dept. of Epidemiology and Public Health. 30 pp.
- Belton, T., R. Roundy and N. Weinstein. 1986. Urban fishermen: managing the risks of toxic exposures. *Environment.* 28:19-20, 30-37.
- Block, G. 1982. Dietary assessment methods: a review of validations of dietary assessment methods. *Am. J. Epidemiol.* 115(4):492-505.
- CCMP. 1994. The Comprehensive Conservation and Management Plan of the Long Island Sound Study. March. 168pp.
- Connelly, N.A. and B.A. Knuth. 1994. Lake Ontario fishing and fish consumption. Sea Grant, Cornell University Cooperative Extension, State University of New York, Oswego, NY.
- Cordle, F. *et al.* 1978. Human exposure to polychlorinated biphenyls and polybrominated biphenyls. *Environmental and Health Perspectives.* 24:157-172.
- CTDPH. 1996. Health department issues new fish consumption advisory. 21 March press release.
- CT Dept. Social Services. 1998. Personal communication. May.
- Cunningham, P.A., S.L. Smith, J.P. Tippet and A. Greene. 1994. A national fish consumption advisory database: a step toward consistency. *Fisheries.* 19(5):14-23.
- Degner, R.L., C.M. Adams, S.D. Moss, and S.K. Mack. 1994. Per capita fish and shellfish consumption in Florida. Industry Report 94-2 for Florida Department of Environmental Protection. University of Florida, Gainesville, FL. 409 pp.
- Duttweiler, M.W. 1978. Fish contaminants and human health. Fact sheet. Sea Grant Extension Program, Cornell University. 12pp
- Ebert, E.S., S.H. Su, T.J. Barry, M.N. Gray and N.W. Harrington. 1996. Estimated rates of fish consumption by anglers participating in the Connecticut Housatonic River Creel Survey. *North American Journal of Fisheries Management,* 16:81-89.
- Elmstahn, S., E. Riboli, F. Lindgarde, B. Gullberg, and R. Saracci. 1966. The Malmo Study: the relative validity of a modified diet history method and an extensive food frequency questionnaire for measuring food intake. *European J. Clin. Nutr.* 50:143-151.
- Essig, R.J., J. F. Witzig, and M.C. Holliday. 1991. Marine Recreational Fishery Statistics Survey; Atlantic and Gulf Coasts, 1987-1989. Current Fisheries Statistics No. 8904. US DOC, NOAA, NMFS. 363pp.
- Fein, G.G., J.L. Jacobson, S.W. Jacobson, P.M. Schwartz, and J.K. Dowler. 1984. Prenatal exposure to polychlorinated biphenyls: effects on birth size and gestational age. *J. Pediatrics.* 105(2): 315-320.
- Fiore, B.J., H.A. Anderson, L.P. Hanrahan, L.J. Olson, and W.C. Sonzogni. 1989. Sport fish consumption and body burden levels of chlorinated hydrocarbons: a study of Wisconsin anglers. *Arch. Environ. Health.* 44(2):82-88.
- Gall, K. and M. Voiland. 1990. Contaminants in sport fish: managing risks. Fact sheet. Sea Grant Extension, Cornell University. 13 pp.
- Hudson River Sloop Clearwater. 1994. Survey of urban subsistence fishers along the Hudson River.

- Hu, T. 1985. Analysis of seafood consumption data analysis in the U.S. 1970, 1974, 1978, 1981. Institute for Policy Research and Evaluation. The Pennsylvania State University. University Park, PA.
- Hutchinson, R. and C.E. Kraft. 1994. Hmong fishing activity and fish consumption. *J. Great Lakes Res.* 20(2):471-478.
- Hyatt, W. 1998. CT Department of Environmental Protection. Personal communication.
- Jacobson, J.L., H. Humphrey, S. W. Jaconson, S.L. Schantz, M.D. Mullin, and R. Welch. 1989. Determinants of polychlorinated biphenyls (PCBs), polybrominated biphenyls (PBBs), and dichlorodiphenyl trichloroethane (DDT) levels in the sera of young children. *AJPH* 79(10):1401-1404.
- Jacobson, J.L., G. Fein, S.W. Jacobson, P.M. Schwartz, and J.K. Dowler. 1984. The transfer of polychlorinated biphenyls (PCBs) and polybrominated biphenyls (PBBs) across the human placenta and into maternal milk. *AJPH* 74(4):378-379.
- Javitz, H. 1980. Seafood consumption data analysis: Final report. Prepared for US EPA by SRI International, Menlo Park, CA.
- Kodama, H. and H. Ota. 1980. Transfer of polychlorinated biphenyls to infants from their mothers. *Arch. Environ. Health.* 35(2):95-100.
- Knuth, B. 1990. Risk communication: a new dimension in sport-fisheries management. *N.A. J. Fish Mngmt.* 10:374-381.
- MacLeod, R. 1998. CT Department of Environmental Protection. Personal communication.
- Millen, B. and Morgan, J. 1996. The 2D food portion visual. Nutrition Consulting Enterprises, P.O. Box 1255, Route 30 Station, Framingham MA, 01701. 34pp.
- Mullen, B. N. Krantzler, L. Grivetti, H. Schultz, and H. Meiselman. 1984. Validity of a food frequency questionnaire for the determinations of individual food intake. *Am. J. Clin. Nutr.* 39:136-143.
- NFI. 1994. Development of a national seafood consumption survey model. Prepared for the National Marine Fisheries Service, NOAA, DOC,. Cooperative Agreement No. NA17FD0144-01. Final report. National Fisheries Institute, Arlington VA. 48pp + appendices.
- Peters, E. and C. Houseknecht. 1992. Consumption surveys for fish and shellfish: a review and analysis of survey methods. Tetra Tech, Inc., EPA Contract No. 68-C9-0013. February.
- Peterson, D.E., M.S. Kanarek, M.A. Kuykendall, J.M. Diedrich, H.A. Anderson, P.L. Remington, and T.B. Sheffy. 1994. Fish consumption patterns and blood mercury levels in Wisconsin Chippewa Indians. *Arch. Environ. Health.* 49(1):53-58.
- Reinert, R.E., B.A. Knuth, M.A. Kamrin, and Q.J. Stober. 1991. Risk assessment, risk management, and fish consumption advisories in the U. S. *Fisheries* 16(6):5-12.
- Rogan, W.J., B.C. Gladen, J.D. McKinney, N. Carreras, P. Hardy, J. Thellen, J. Tingelstad, and M. Tully. 1986. Polychlorinated biphenyls (PCBs) and dichlorodiphenyl dichloroethene (DDE) in human milk: effects of maternal factors and previous lactation. *AJPH.* 76(2):172-177.
- Rohlf, F.J. and R.R. Sokal. 1969. *Statistical Tables.* W.H. Freeman and Company, San Francisco. 253pp.
- Russell-Briefel, R., A. Caggiula, and L. Kuller. 1985. A comparison of 3 dietary methods for estimating vitamin A intake. *Am. J. Epi.* 122:628-636.
- Sanders, M. and B.L. Haynes. 1988. Distribution pattern and reduction of polychlorinated biphenyls (PCBs) in bluefish, *Pomatomus saltatrix*, filets through adipose tissue removal. *Bull. Environ. Contam. Toxicol.* 41:670-677.
- Schakel, S.F., Y.A. Sievert and I.M. Buzzard. 1988. Sources of data for developing and maintaining a nutrient database. *J. Am. Diet. Assoc.* 88:1268-1271.
- Schwartz, P.M., S.W. Jacobson, G. Fein, J.L. Jacobson, and H.A. Price. 1983. Lake Michigan fish consumption as a source of polychlorinated biphenyls in human cord serum, maternal serum and milk. *AJPH* 73(3):293-296.
- Taylor, P.R., C.E. Lawrence, H. Hwang and A.S. Paulson. 1984. Polychlorinated biphenyls: influence on birth weight and gestation. *Public Health Briefs.* 74:1153-1154.

- Toal, B. 1987. A survey of fishing and fish consumption patterns among Connecticut sports fishermen. Pp. 38-43 In: Proceedings of the Workshop on Risk Assessment and Contaminated Fish and Shellfish. 15-16 January 1987.
- USDA Agricultural Statistics. 1984. Consumption and family living, Table 697, page 13.
- USDA Nutrition Monitoring Division. 1987. Composition of foods: finfish and shellfish products. Agriculture Handbook Number 8-15. 192 pp.
- US EPA. 1980. Appendix C: Guidelines and methodology used in preparation of health effects assessment chapters of the Consent Decree Water Criteria Documents. 45 *FR*79347, 28 November.
- USEPA. 1989. Assessing human health risks from chemically contaminated fish and shellfish: a guidance manual. USEPA-503/8-89-002. Office of Marine and Estuarine Protection and Office of Water Regulation and Standards, Washington, DC.
- Wagstaff, D.J. 1984. Food intake assessment in the United States. *Journal of Toxicology & Clinical Toxicology*. 21(1&2):151-168.
- Wagstaff, DJ., M. Maeburn, M. Bolger, S. Conrath, and B. Hackley. 1986. Status of data sources on fish consumption in the United States. *Marine Fisheries Review*. 48(3):20-23.
- Weinstein, S.J. and C.A. Bisogni. 1995. Hispanics in Metropolitan New York: perceptions and practices related to the quality, safety and healthfulness of fish and seafood. Project No. R/SHH-2, New York Sea Grant Institute, Cornell University, Ithaca, NY. 184 pp.
- Wendt, M.E. 1986. Low income families consumption of freshwater fish caught from New York state waters. Thesis. Cornell University, New York.
- West, P.C., J.M. Fly, R. Marans and F. Larkin. 1989. Michigan sport anglers fish consumption survey. University of Michigan School of Natural Resources. Natural Resource Sociology Research Lab Technical Report #1. Ann Arbor, MI.
- West, P.C., J.M. Fly, R. Marans, F. Larkin, and D. Rosenblatt. 1993. 1991-92 Michigan sport anglers fish consumption study. University of Michigan School of Natural Resources. Natural Resource Sociology Research Technical Report No. 6, Ann Arbor, MI. 171 pp. Plus appendices.
- WIC program. 1998. Personal communication. June.
- Wickizer, T.M., L.B. Brilliant, R. Copeland, and R. Tilden. 1981. Polychlorinated biphenyl contamination of nursing mothers' milk in Michigan. *AJPH* 71(2):132-137.
- WQS. 1992. Water Quality Standards, State of Connecticut Department of Environmental Protection, Water Management Bureau. Adopted January 1992.
- Yakushiji, T., I. Watanabe, K. Kuwabara, R. Tanaka, T. Kashimoto, and N. Kunita. 1984. Postnatal transfer of PCBs from exposed mothers to their babies: influence of breast-feeding. *Arch. Environ. Health*. 39(5):368-375.

Appendix 1. Fish consumption advisories for Connecticut



STATE OF CONNECTICUT
DEPARTMENT OF PUBLIC HEALTH

Press Release • March 21, 1996

For More Information: Susan Raff @ 509-7108

Drs. Mary Lou Fleissner & Gary Ginsberg @ 240-9022

HEALTH DEPARTMENT ISSUES NEW FISH CONSUMPTION ADVISORY

The Department of Public Health (CTDPH), in conjunction with the Connecticut Department of Environmental Protection (CTDEP), has developed a fish consumption advisory for mercury levels in freshwater fish from Connecticut waterbodies. The advisory for mercury is added to the consumption advice previously issued by CTDPH due to PCB contamination of certain fish.

"Locally caught fish are a valuable protein source that Connecticut residents can safely enjoy as long as they follow the consumption advisory," stated Stephen Harriman, Commissioner of the CTDPH.

The advisory for mercury (see Table 1) recommends that people considered as High Risk (pregnant women, women planning pregnancy within the next year, and children under age 6) should limit their consumption of most species of freshwater fish caught in the state to one meal per month. Those not in the High Risk Group can safely eat greater amounts of freshwater fish (1 meal/week). The only exceptions to this general advisory are:

- Trout can, in general, be safely eaten without consumption limits by all residents of the state. However it is prudent for members of the High Risk Group to moderate consumption of larger trout (>15") from lakes and ponds to once per month.
- The 4 Lakes with the highest mercury levels (Dodge Pond in East Lyme; Lake McDonough in Barkhamsted; Silver Lake in Berlin; Lake Wyassup in North Stonington) have a specific advisory for members of the High Risk Group to not eat any bass (largemouth or smallmouth) or pickerel; others should limit consumption of these fish to once per month.
- Existing advisories for limiting fish consumption should still be followed. These advisories pertain to PCB contamination of fish on the Housatonic River (most species), Lake Housatonic in Derby/Seymour/Shelton (carp & eels), Connecticut River (carp only) and Long Island Sound (bluefish and striped bass). An additional advisory exists for Brewster Pond in Stratford (catfish, bullheads) due to chlordane contamination.

The new and pre-existing advisories are combined in Table 2 which indicates 8 freshwater bodies and Long Island Sound for which specific advice is warranted. The general advisory for mercury applies only to freshwater bodies. Mercury is not a concern for fish from Long Island Sound.

Mercury can accumulate in humans who consume fish, especially where the levels in fish are high. This can cause toxic effects on the nervous system and kidney, with the greatest concern for exposure during pregnancy and early childhood development. PCBs are similar to mercury in their ability to accumulate in humans and potentially affect the nervous system, especially during development. Nursing mothers are considered part of the High Risk Group for those waterbodies

where PCBs are a concern (Table 2) since PCBs are readily transferred to children via breastmilk. PCBs also present a risk of cancer and reproductive abnormalities.

The consumption advice presented in Tables 1 and 2 protects against the adverse effects of these fish contaminants. CTDPH evaluated the health effects from exposure to mercury to establish levels of safe consumption for both the High Risk Group and general population. This was coupled with the mercury data for Connecticut fish to develop the specific consumption advice for people catching fish in-state. An extensive database exists for mercury levels in fish as provided in a new study conducted by the University of Connecticut's Environmental Research Institute for 54 waterbodies (mostly lakes and ponds), as well as from data CTDEP has been collecting over the past 8 years for fish from many of the rivers and streams in the state.

Consumers can decrease their exposure to mercury and PCBs by choosing to eat smaller fish (e.g., panfish) whenever possible. PCB exposure can be further reduced by removing skin and other fatty portions of fish, and by broiling so that fat drips away from the flesh. However, cooking and cleaning does not decrease the mercury content of fish since mercury is present in the edible (fillet) portion.

Table 1. Mercury Fish Consumption Advisory*

GENERAL ADVISORY

	<u>High Risk Group¹</u>	<u>Low Risk Group</u>
All Freshwater Fish Except as Noted Below	One meal/month	One meal/week

SPECIFIC ADVICE

Largemouth / Smallmouth Bass & Pickerel from Dodge Pond, Lake McDonough, Silver Lake, & Lake Wyassup	Do not eat	One meal/month
--	------------	----------------

SEPARATE ADVICE FOR TROUT

Trout in rivers, streams, lakes, ponds	No Limits on Consumption ²
--	---------------------------------------

¹ High Risk Group includes pregnant women, women planning pregnancy within one year, and children under 6. Low Risk Group includes everyone else.

² Due to the potential for mercury to accumulate in larger fish from lakes, it is prudent for the High Risk Group to moderate consumption of large trout (>15") from lakes/ponds to once per month.

*This advice is in addition to the existing fish consumption advisories issued by CTDPH. See Table 2 for the complete set of advisories.

Table 2. Overall Fish Consumption Advisory

Advisory Type	Waterbody	Fish Species	High Risk Group ¹ Consumption Advice	Low Risk Group Consumption Advice	Contaminant
Specific	Dodge Pond Lake McDonough Silver Lake Lake Wyassup	Largemouth Bass, Smallmouth Bass, Pickerel	Do not eat	One meal per month	Mercury
	Housatonic River (N of Stevenson Dam)	All species except as noted**	Do not eat	Do not eat	PCBs
	Lake Housatonic	Carp & Eels	Do not eat	Do not eat	PCBs
	Connecticut River	Carp	Do not eat	Two meals per month	PCBs
	Brewster Pond	Catfish & Bullheads	Do not eat	Do not eat	Chlordane
	Long Island Sound	Striped Bass; Bluefish > 25"	Do not eat	Two meals per month	PCBs
General	Remainder of CT's fresh waterbodies	Trout	No Limits on Consumption ²	No Limits on Consumption	--
		All other fish	One meal per month	One meal per week	Mercury

** Exempted species are: yellow perch (Bull's Bridge area); yellow perch & sunfish (Lake Lillinonah); yellow /white perch & sunfish from Lake Zoar.

¹ High Risk Group includes pregnant women, women planning to become pregnant within one year, and children under 6. Nursing mothers are also included in the High Risk Group for PCBs. Low risk group includes everyone not in the High Risk Group.

² It is prudent for the High Risk Group to moderate consumption of large trout (>15") from lakes and ponds to once per month.

Appendix 2. Food frequency questionnaire

FISH AND SEAFOOD EATING HABITS

In order to get a complete picture of your fish eating habits, we would like to know what kinds of fish and seafood you and your family eat, including, but not limited to, those listed. This includes clam chowder, fish in stews or casseroles, breaded shrimp or fish, scallops, squid (calamari), sardines, or tuna sandwiches. Use a separate page for each person...write each person's first name in the upper left-hand column.

Please try to think how often you usually eat each type of seafood. For example, if you don't eat lobster very often...how many times a *year* do you eat it? If you eat a particular seafood a lot...is it three times a *month*? Once a *week*? Check "never" if you don't eat a fish or seafood listed below.

Use the *Food Portion Pictures* enclosed to figure out the amount of fish or seafood you eat. *Side A* can be used to describe soups, casseroles or a mound of food on a plate, such as scallops, shrimp or tuna. Use *Side B* to describe fish fillets, steaks or whole fish. First choose a shape that is most like what you ate (A12, $\frac{1}{2}$ B3, etc.), then decide on the thickness of the seafood portion using the "*thickness measure*" on Side B (3,6, etc.). Finally, count how many of that shape you ate (1, 4, 6, etc.)

For example, if you eat 2 pieces of fish the size of B4 with a thickness of 3, then write "2-B4*3" in the space provided. If you eat one bowl of clam chowder $\frac{1}{2}$ the size of A15, then write "1- $\frac{1}{2}$ A15". If you eat a serving of tuna salad the size of A16, then write "1-A16". If you eat 5 pieces of fish $\frac{1}{2}$ the size of B1 with a thickness of 5, then write "5- $\frac{1}{2}$ B1*5". See other EXAMPLES provided on the following sheet.



FIRST NAME: <i>Nancy</i>	How often do you eat each type of				When do you eat this fish or seafood? (Examples: "all year," or "May - Aug")	How much do you usually eat per serving? (Use Food Portion Pictures--list # eaten - shape # * thickness #.)	What parts do you eat? (Check all that apply)										Where do you usually get this	IF CAUGHT (ANGLER ONLY): Please indicate where you catch the fish you eat. (Give water body and name of nearest town). Examples: Striped bass: Derby Dam, The Race Flounder: New Haven Harbor Trout: Housatonic River, Kent; Lake Zoar Lobster: Norwalk Harbor
	SEAFOOD TYPE <i>Example</i>	NEVER	# times per WEEK	# times per MONTH			# times per YEAR	Entire fish	Meat	Head	Skin &/or Fins	Bones	Eyes	Roe / Eggs	Organs	Tomalley/Mustard		
Lobster - whole				1	July	1-1/2 lb.	<input checked="" type="checkbox"/>							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
- roll/salad/tail	<input checked="" type="checkbox"/>																	
Blue crab-whole				4	Jun-Aug	4 large		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			Norwalk Islands
- cake / salad				1	Summer	2-B3*4		<input checked="" type="checkbox"/>										
Clams - whole				4	All Year	1-A13	<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
-chowder/sauce			1		All Year	1-1/2 A15	<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
-strips	<input checked="" type="checkbox"/>																	
Oysters - whole				8	Oct-Jan	2-A16	<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>		
- stew				2	Nov	1-A11	<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>		
Blue Mussels	<input checked="" type="checkbox"/>																	
Bluefish			3		June-Sept	1-1/2 B5*3	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>			Long Island Sound
Striped Bass			4		June-Sept	2-B3*4	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>			Damon Housatonic River-Derby
Eel				1	Dec	1-B1*2	<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>		
Porgy/Scup			1		All Year	2-B2*4	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>						<input checked="" type="checkbox"/>			New Haven harbor, New London pier
Blackfish/Tautog				3	Spring	1-B3*5	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>			Rocky Neck
Tuna - canned		1			All Year	1-A16	<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>		
- fresh				2	Summer	1-B3*6	<input checked="" type="checkbox"/>										<input checked="" type="checkbox"/>	
Froz. fish sticks				4	All Year	4-B1*6	<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>		
Imitation crab				1	All Year	1-A17	<input checked="" type="checkbox"/>									<input checked="" type="checkbox"/>		

FIRST NAME:	How often do you eat each type of				When do you eat this fish or seafood? (Examples: "all year," or "May - Aug")	How much do you usually eat per serving? (Use Food Portion Pictures--list # eaten - shape # * thickness #.)	What parts do you eat? (Check all that apply)											Where do you usually get this	IF CAUGHT (ANGLER ONLY): Please indicate where you catch the fish you eat. (Give water body and name of nearest town). Examples: Striped bass: Derby Dam, The Race Flounder: New Haven Harbor Trout: Housatonic River, Kent; Lake Zoar Lobster: Norwalk Harbor
	NEVER	# times per WEEK	# times per MONTH	# times per YEAR			Entire fish	Meat	Head	Skin &/or Fins	Bones	Eyes	Roe / Eggs	Organs	Tomalley/Mustard	CAUGHT-self/friend/family member	Bought in STORE		
Lobster - whole																			
- roll/salad/tail																			
Blue crab-whole																			
- cake / salad																			
Clams - whole																			
-chowder/sauce																			
-strips																			
Oysters - whole																			
- stew																			
Blue Mussels																			
Bluefish																			
Striped Bass																			
Eel																			
Porgy/Scup																			
Blackfish/Tautog																			
Tuna - canned																			
- fresh																			
Froz. fish sticks																			
Imitation crab																			

Appendix 3. Spanish and Vietnamese versions of food record

RECORD OF FISH AND SEAFOOD MEALS

NGÀY THỨ MẤY TRONG TUẦN _____ NGÀY _____ THÁNG _____ NĂM _____
(THỨ HAI, THỨ BA VV...)

NGÀY _____	THÍ ĐỤ	TÊN 1:	TÊN 2:	TÊN 3:	TÊN 4:	TÊN 5:	TÊN 6:	TÊN 7:
1. QUÝ VỊ CÓ ĂN CÁ HOẶC MÓN BIỂN TRONG NGÀY HÔM NAY KHÔNG?	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG
2a LOẠI CÁ (TÊN CỦA CÁ)								
2b MÃ SỐ (XEM TỔ MÃ SỐ HÌNH) (DẠNG - TRANG TRƯỚC)								
3. KHẤU LƯỢNG	DẠNG MÃ							
	SỐ LƯỢNG							
	ĐỘ DÀY							
	BỀ NGANG							
	CHIỀU DÀI							
4. KIỂM ĐƯỢC CÁ BẰNG CÁCH NÀO? 1. TỰ ĐI CÀU / BẠN ĐI CÀU 2. MUA TẠI TIỆM CÁ / SIÊU THỊ 3. MUA TẠI BẾN TÀU 4. QUẦY CÁ BÁN TRÊN LỀ ĐƯỜNG 5. ĐƯỢC TẶNG 6. TRAO ĐỔI 7. NHÀ HÀNG / TIỆM ĂN 8. QUÁN ĂN 9. HỘI CHỢ 10. HOẶC NƠI KHÁC								

5. MUA TRONG HÌNH THỨC NAO? 1. CHÁO CÁ, CANH CHUA CÁ, CÁ KHO, CHẢ CÁ, XÁ LÁCH CÁ, BÁNH MÌ CÁ, CÁ TƯỞI, ĐÔNG LẠNH, CÁ HỘP 2. CÁ SỐNG 3. CÁ TƯỞI 4. CÁ ĐÔNG LẠNH (CHỨA NẤU) 5. CÁ HỘP 6. CÁ KHO 7. CÁ MUỐI								
6. NẤU VÀ ĐUNG? (NẤU CHÍN=ĐUNG NONG / NGUỘI)	<input type="checkbox"/> SỐNG <input type="checkbox"/> NẤU CHÍN	<input type="checkbox"/> SỐNG <input type="checkbox"/> NẤU CHÍN	<input type="checkbox"/> SỐNG <input type="checkbox"/> NẤU CHÍN	<input type="checkbox"/> SỐNG <input type="checkbox"/> NẤU CHÍN	<input type="checkbox"/> SỐNG <input type="checkbox"/> NẤU CHÍN	<input type="checkbox"/> SỐNG <input type="checkbox"/> NẤU CHÍN	<input type="checkbox"/> SỐNG <input type="checkbox"/> NẤU CHÍN	<input type="checkbox"/> SỐNG <input type="checkbox"/> NẤU CHÍN
7. LẪN BỘT, PHA TRỘN BỘT, LẪM CHÁ?	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG	<input type="checkbox"/> CÓ <input type="checkbox"/> KHÔNG
8. NẤU BẰNG CÁCH NÀO? 1. NƯỚNG CHÍN 2. NƯỚNG VÀNG 3. LUỐC, CHỪNG, CÁCH THUY 4. CHIÊN (ÍT DẦU) 5. CHIÊN (NHIỀU DẦU) 6. NƯỚNG LỬA THAN 7. MICROWAVED 8. CANH CHUA, NẤU NGỌT 9. KHO, KHO TỌ 10. NẤU CHÁO 11. NẤU CÁCH KHÁC								
9. ĐUNG PHẦN NAO CỦA CÁ? (ĐANH DẤU TẤT CẢ CÁC PHẦN ĐƯỢC ĐUNG)	<input type="checkbox"/> THỊT <input type="checkbox"/> ĐÁ/VI <input type="checkbox"/> ĐẦU <input type="checkbox"/> XƯƠNG <input type="checkbox"/> MẮT <input type="checkbox"/> TRỨNG <input type="checkbox"/> GẠCH <input type="checkbox"/> TUY <input type="checkbox"/> RUỘT <input type="checkbox"/> MỠ	<input type="checkbox"/> THỊT <input type="checkbox"/> ĐÁ/VI <input type="checkbox"/> ĐẦU <input type="checkbox"/> XƯƠNG <input type="checkbox"/> MẮT <input type="checkbox"/> TRỨNG <input type="checkbox"/> GẠCH <input type="checkbox"/> TUY <input type="checkbox"/> RUỘT <input type="checkbox"/> MỠ	<input type="checkbox"/> THỊT <input type="checkbox"/> ĐÁ/VI <input type="checkbox"/> ĐẦU <input type="checkbox"/> XƯƠNG <input type="checkbox"/> MẮT <input type="checkbox"/> TRỨNG <input type="checkbox"/> GẠCH <input type="checkbox"/> TUY <input type="checkbox"/> RUỘT <input type="checkbox"/> MỠ	<input type="checkbox"/> THỊT <input type="checkbox"/> ĐÁ/VI <input type="checkbox"/> ĐẦU <input type="checkbox"/> XƯƠNG <input type="checkbox"/> MẮT <input type="checkbox"/> TRỨNG <input type="checkbox"/> GẠCH <input type="checkbox"/> TUY <input type="checkbox"/> RUỘT <input type="checkbox"/> MỠ	<input type="checkbox"/> THỊT <input type="checkbox"/> ĐÁ/VI <input type="checkbox"/> ĐẦU <input type="checkbox"/> XƯƠNG <input type="checkbox"/> MẮT <input type="checkbox"/> TRỨNG <input type="checkbox"/> GẠCH <input type="checkbox"/> TUY <input type="checkbox"/> RUỘT <input type="checkbox"/> MỠ	<input type="checkbox"/> THỊT <input type="checkbox"/> ĐÁ/VI <input type="checkbox"/> ĐẦU <input type="checkbox"/> XƯƠNG <input type="checkbox"/> MẮT <input type="checkbox"/> TRỨNG <input type="checkbox"/> GẠCH <input type="checkbox"/> TUY <input type="checkbox"/> RUỘT <input type="checkbox"/> MỠ	<input type="checkbox"/> THỊT <input type="checkbox"/> ĐÁ/VI <input type="checkbox"/> ĐẦU <input type="checkbox"/> XƯƠNG <input type="checkbox"/> MẮT <input type="checkbox"/> TRỨNG <input type="checkbox"/> GẠCH <input type="checkbox"/> TUY <input type="checkbox"/> RUỘT <input type="checkbox"/> MỠ	<input type="checkbox"/> THỊT <input type="checkbox"/> ĐÁ/VI <input type="checkbox"/> ĐẦU <input type="checkbox"/> XƯƠNG <input type="checkbox"/> MẮT <input type="checkbox"/> TRỨNG <input type="checkbox"/> GẠCH <input type="checkbox"/> TUY <input type="checkbox"/> RUỘT <input type="checkbox"/> MỠ
10a. NẾU ĐI CÁU: NGÀY _____ THÁNG _____ NĂM _____								
10b. CÁU TẠI ĐẤU? (ĐỊA ĐIỂM, SÔNG, BIỂN, HỒ)								
10c. ĐỘ LỚN CỦA CÁ (PHẦN, KILO, GRAM)								

Lista del artículo y número de código

La siguiente lista describe varios pescados y mariscos con un número de código al lado de cada artículo. Escoja el pescado o marisco que mejor describa el que usted consume. Si usted consumió (comió) un platillo compuesto, de ostras y conchas, puede indicarlo como que, usted comió un platillo compuesto poniéndolo en el código #4 en a pregunta 2b. Truchas marrones y de color pueden ser puestas como truchas en agua fresca- código 179. Cualquier clase de pez lenguado (snapper) deben ser puestas en la categoría de snapper- código #162.

Artículo	código	Artículo	código	Artículo	código
Preparado.....	código	Pez anquila (de agua fresca) ..	124	Gulfo de México)	161
Caserola	001	Anquila (de agua salada)	125	Striped Bass	103
Caviar (huevos de pescado	002	Anguila (no específica)	126	Pez ojón, pez semejante	
Ceviche	003	Pez lenguado, pez rodaballo,		Perca (género mola)	165
Platillo compuesto	004	Pez torpe	127	Pez espada	166
Pastel de cangrejo	005	Pez mero	128	Pez negro	106
Fish sticks / cakes	006	Haddock	129	Tilapia	168
Gefilte fish	007	Pez mero (familia de		Tilefish	169
Imitación de mariscos	008	pleuronectidos)	130	Trucha (de agua salda)	170
Lox	009	Pez merluza	131	Trucha (de agua fresca)	171
Sardinás	010	Arenque	132	Trucha (criado en granja)	172
Ensaladas de mariscos		Lusk	133	Trucha (no específica)	173
o pescados	011	Pez molva, lota, merluza		Atún (en lata-enlatado)	174
Sopas y estofados (guisados) ..	012	(familia de gádidos)	134	Atún (fresco)	175
Sushi	013	Pez escombro	135	Pez robailado, pez rombo	176
Sushimi	014	Mahi Mahi (dolphinfish)	121	Pez blanco (de los lagos,	
Otros mariscos preparados	015	Marlin	137	parecido al salmón	177
		Pez de caña	138	Whiting (hake)	131
Pescados.....	código	Pez rojo, salmonete	139	Whiting (kingfish)	179
Róbalo (de boca grande)	101	Orange Roughy	140	Whiting (no específico)	180
Róbalo (de boca pequeña)	102	Northern Pike	141	Otros pescados	
Róbalo (sin piel)	103	Percha (blanca).....	142	(de aguas frescas)	181
Róbalo (no específico)	104	Percha (amarilla)	143	(de aguas salada)	182
Pez azulado	105	Percha (de agua salada)	144	(no específicos)	183
Pescado negro (pez de la		Percha (no específico)	145		
costa atlántica)	106	Pez lucio pequeño (de aqua		Mariscos.....	código
Pez agalla	107	dulce)	146	Atmejás	201
Pez boñito	108	Pollock	147	Cangrejo	202
Pez sargo; besugo (de agua		Pez pagro, pargo	148	Cangrejo, otros	203
dulce)	109	Red Fish/Ocean Perch	142	Cangrejo de aguiá dulce	204
Pez búfalo (de agua dulce)	110	Pez roca	149	Langosta	205
Pez chorrito, pez de cabeza		Salmón (de agua salada)	150	Mussels	206
grande:	111	Salmón (criado en granja))	151	Pupo	207
Pez carpa	112	Salmón (de los Grandes		Ostras	208
Pez siluro; barbo; bagre;		Lagos)	152	Conchas	209
(de agua fresca)	113	Salmón (no específico)	153	Conchas (no específicas)	210
(de agua salada)	114	Sardinás	154	Scungilli (conch)	211
(Criado en granja)	115	Scup/Porgy	148	Camaronés	212
(no específico)	116	Scrod	157	Calamares	213
Pez coto	117	Pez sábalo, (pez genero		Otros mariscos	214
Bacalao	118	alosa) pez alosa	158		
Bacalao seco	119	Tiburón	159		
Croaker	120	Pez raya	160		
Pez Delfin	121	Pez renguado	162		
Dory/John Dory	122	Pez esparlán	163		
Pez tambor (martillo)	123	Pez mordedor (gran tamaño			

Registro de comidas de pescados y mariscos

Escriba el primer nombre de los miembros de su familia en los cuadros mostrados debajo, luego conteste todas las preguntas de cada persona en 10 días. *Cuando registre los tipos de pescados o mariscos consumidos, recuérdese de incluir sopas de almejas, pescados, guisados y caserolas, camarones empanados o pescados empanados, y emparedados de atún.* También no se olvide de incluir pescados y mariscos consumidos con arroz.

Utilice las Figuras de Porciones de Comidas incluidas para reportar la cantidad de pescado o mariscos que consumió. Utilice el lado A para las sopas, caserolas o platos como conchas, camarones o atún. Utilice el lado B para los filetes de pescados, "steaks", o pescado completo. Primero utilice la figura que se parezca más a la porción de lo que usted consumió (A12, B3, etc.). Escriba esto dentro del cuadro que dice "código de figura" en la pregunta # 3. Luego decida el grosor de la porción de la comida, utilizando la "medida de grosor" en el lado B (3, 6, etc.), y escriba el número de grosor en el cuadro de la pregunta # 3. Luego escriba la cantidad de esa figura que usted consumió (1, 2, 1/2, etc.) en el cuadro de la pregunta 3 que dice "cantidad".

Por ejemplo, si usted consumió 5 pedazos de pescado de B1 con un grosor de 3, escriba "B1" en el cuadro que dice "código de figura", "3" en el cuadro que dice "número de grosor" y el número 5 en el cuadro que dice "cantidad consumida". Si usted consumió 1/2 de un plato de sopas de cangrajo de A15, escriba A15 en el cuadro que dice "codigo de figura" y 1/2 en el cuadro que dice "cantidad consumida". Observe el ejemplo incluido debajo (Nancy).

Si alguien consumió más de una porción de pescado por día (no incluida en platillos compuestos), favor de indicar la porción adicional en la última página. Este seguro de decirnos el primer nombre de la persona, y el número del día cuando la porción adicional fue consumida, luego conteste las preguntas sobre esa porción en la misma manera.

Día de la semana (lunes, martes, etc.): _____

Fecha: _____

Día 1		Ejemplo: Nancy	Primer nombre 1:	Primer nombre 2:	Primer nombre 3:	Primer nombre 4:	Primer nombre 5:	Primer nombre 6:	Primer nombre 7:
1	¿Usted ha comido pescados o mariscos el día de hoy?	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No
2a	¿Qué tipo de pescado? (Nombre)	Atun, enlatado							
2b	¿ Número do código (mire la lista de artículo y # de código)								
3	Código de figura								
	Cantidad								
	Número de grosor								
	Cantidad consumida								
4	¿Cómo lo obtuvo? 1 Lo pesco/amigo 2 Tienda/mercado de pescado 3 Pier 4 Estante en el camino 5 Pegalo 6 Intercambio de artículo 7 Restaurante/cafetería 8 En un refugio 9 Festival 10 Otra manera (especifique)								

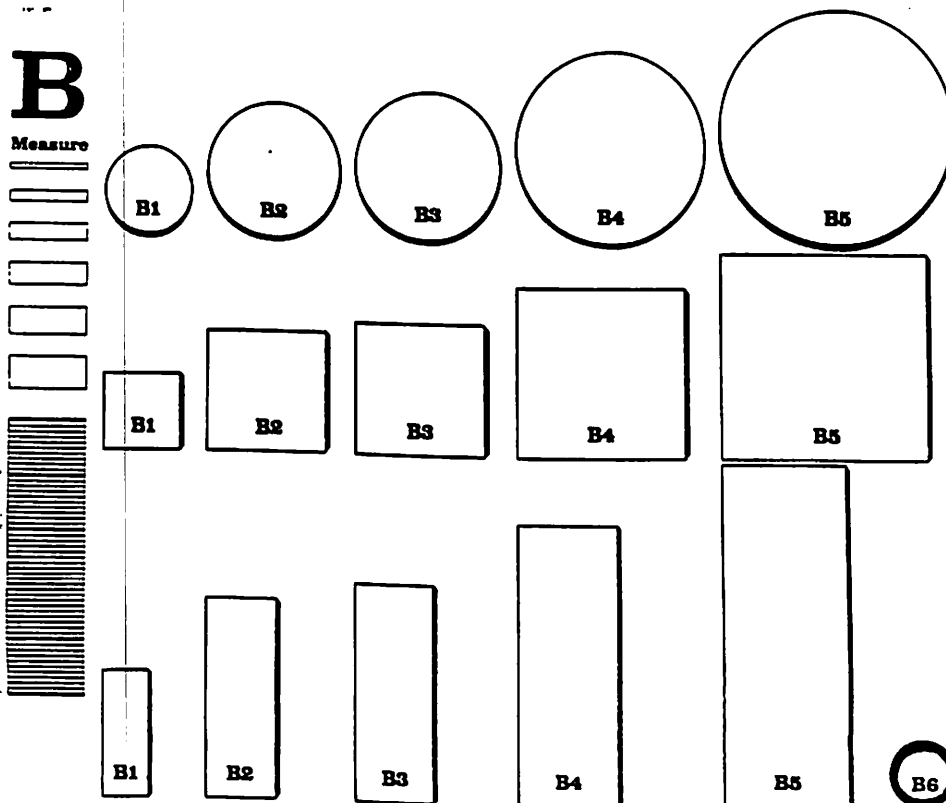
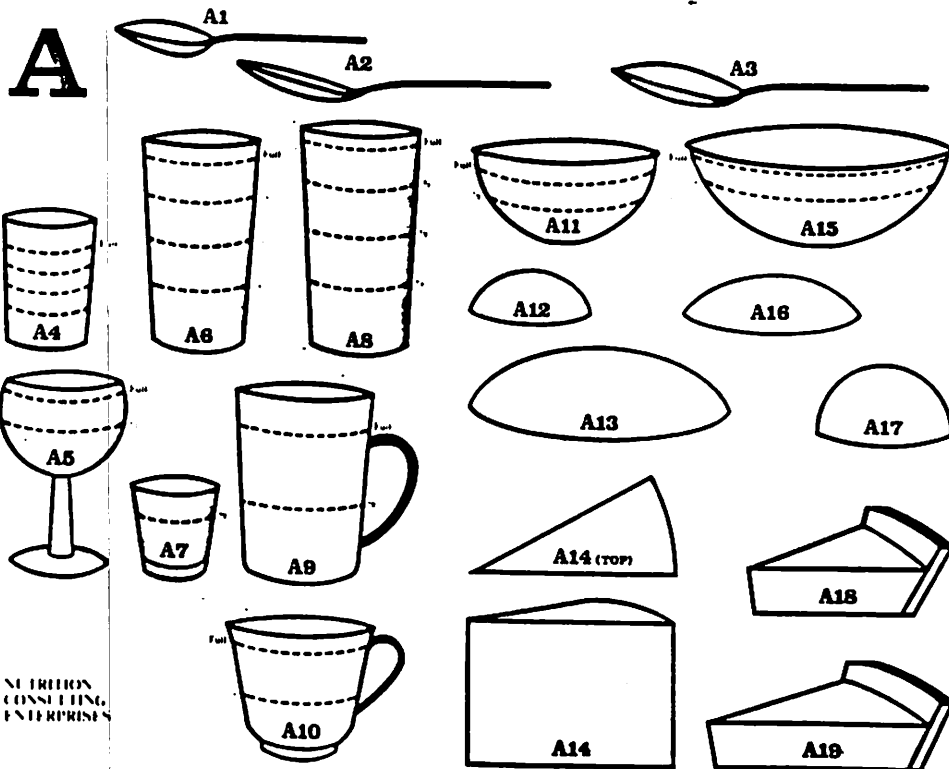
5. ¿Forma comprado? 1 Preparado (sopa /guisado, empanado enslada / salsa/ emparedado / pastel) fresco, refrigerado, enlatado 2 Vivo 3 Fresco 4 Refrigerado/crudo 5 Enlatado 6 Ahumado /seco / picado 7 Otra forma (especifique)								
6 ¿Cómo fue servido? (Cocinado=servido caliente/frío)	<input type="checkbox"/> crudo <input type="checkbox"/> cocinado	<input type="checkbox"/> crudo <input type="checkbox"/> cocinado	<input type="checkbox"/> crudo <input type="checkbox"/> cocinado	<input type="checkbox"/> crudo <input type="checkbox"/> cocinado	<input type="checkbox"/> crudo <input type="checkbox"/> cocinado	<input type="checkbox"/> crudo <input type="checkbox"/> cocinado	<input type="checkbox"/> crudo <input type="checkbox"/> cocinado	<input type="checkbox"/> crudo <input type="checkbox"/> cocinado
7 ¿Empanado o en revoltillo?	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No	<input type="checkbox"/> Si <input type="checkbox"/> No
8. ¿Cómo fue cocinado? 1 Homeado 2 Asado 3 Calentado en agua/ hervido/al vapor 4 Al sartén en poco aceite 5 Frito en mucho aceite 6 Al carbón 7 Ahumado 8 En el microonda 9 En sòpos 10 Ensalada o emparedado 11 Sopa, guisado, caserola 12 Otra (especifique)								
9 ¿Partes consumidas? (Marque todas las que apliquen)	<input type="checkbox"/> pescado entero <input type="checkbox"/> carne <input type="checkbox"/> piel/ aletas <input type="checkbox"/> cabeza <input type="checkbox"/> huesos <input type="checkbox"/> ojos <input type="checkbox"/> huevos <input type="checkbox"/> grasas <input type="checkbox"/> mostaza <input type="checkbox"/> organos	<input type="checkbox"/> pescado entero <input type="checkbox"/> carne <input type="checkbox"/> piel/ aletas <input type="checkbox"/> cabeza <input type="checkbox"/> huesos <input type="checkbox"/> ojos <input type="checkbox"/> huevos <input type="checkbox"/> grasas <input type="checkbox"/> mostaza <input type="checkbox"/> organos	<input type="checkbox"/> pescado entero <input type="checkbox"/> carne <input type="checkbox"/> piel/ aletas <input type="checkbox"/> cabeza <input type="checkbox"/> huesos <input type="checkbox"/> ojos <input type="checkbox"/> huevos <input type="checkbox"/> grasas <input type="checkbox"/> mostaza <input type="checkbox"/> organos	<input type="checkbox"/> pescado entero <input type="checkbox"/> carne <input type="checkbox"/> piel/ aletas <input type="checkbox"/> cabeza <input type="checkbox"/> huesos <input type="checkbox"/> ojos <input type="checkbox"/> huevos <input type="checkbox"/> grasas <input type="checkbox"/> mostaza <input type="checkbox"/> organos	<input type="checkbox"/> pescado entero <input type="checkbox"/> carne <input type="checkbox"/> piel/ aletas <input type="checkbox"/> cabeza <input type="checkbox"/> huesos <input type="checkbox"/> ojos <input type="checkbox"/> huevos <input type="checkbox"/> grasas <input type="checkbox"/> mostaza <input type="checkbox"/> organos	<input type="checkbox"/> pescado entero <input type="checkbox"/> carne <input type="checkbox"/> piel/ aletas <input type="checkbox"/> cabeza <input type="checkbox"/> huesos <input type="checkbox"/> ojos <input type="checkbox"/> huevos <input type="checkbox"/> grasas <input type="checkbox"/> mostaza <input type="checkbox"/> organos	<input type="checkbox"/> pescado entero <input type="checkbox"/> carne <input type="checkbox"/> piel/ aletas <input type="checkbox"/> cabeza <input type="checkbox"/> huesos <input type="checkbox"/> ojos <input type="checkbox"/> huevos <input type="checkbox"/> grasas <input type="checkbox"/> mostaza <input type="checkbox"/> organos	<input type="checkbox"/> pescado entero <input type="checkbox"/> carne <input type="checkbox"/> piel/ aletas <input type="checkbox"/> cabeza <input type="checkbox"/> huesos <input type="checkbox"/> ojos <input type="checkbox"/> huevos <input type="checkbox"/> grasas <input type="checkbox"/> mostaza <input type="checkbox"/> organos
¿Si lo pesco usted?: 10a ¿Cuándo? (Fecha)								
10b ¿Dónde? (Cuerpo de agua y ciudad mas cercana)								
10c ¿Tamaño (pescado solamente- pulgadas o libras)								

ITEM CODE LIST

PREPARED ITEM.....CODE			
Caviar (fish eggs, roe).....	002	Dorado	189
Combination platter	004	Drum	123
Crab, Imitation	215	Eel	124
Crabmeat, Canned	219	Eel, Raw	241
Fish sticks.....	006	Flounder	127
Gefilte fish	007	Grouper	128
Lox.....	009	Grunt	244
Sardines	010	Haddock	129
Shad, Smoked	232	Halibut	130
Sushi	013	Hake	131
Sushimi	014	Herring	132
Frozen Fillet.....	016	Herring, Dried.....	249
Stuffed Clams.....	017	Mackerel.....	135
Mackerel, Canned	019	Mahi Mahi (dolphinfish)	121
Herring, Canned	020	Milkfish	237
Salmon, Croquettes.....	021	Monkfish (anglerfish).....	138
Salmon, Canned.....	022	Mullet.....	139
Salmon, Smoked	231	Orange Roughy	140
Fish Cakes	023	Northern Pike	141
Shrimp roll/salad.....	024	Perch (Ocean)/Redfish.....	142
Fish Chowder, Canned.....	025	Perch (White)	143
Fish Chowder, Bluefish	233	Perch (Yellow).....	144
Fish Chowder, Scup	234	Perch (unspecified)	145
Fish Chowder, Tautog	235	Pickeral	146
Anchovies, Canned	026	Pollock	147
Shrimp Soup.....	027	Porgy/Scup.....	148
Lg & Jumbo Stuffed Shrimp.....	028	Redfish/Ocean Perch	142
		Salmon	150
FISH	CODE	Salmon, Raw	242
Anchovies	191	Sardine	154
Bass, Calico	230	Scup/Porgy.....	148
Bass (Largemouth).....	101	Scrod.....	157
Bass (Smallmouth).....	102	Sea Bass.....	187
Bass, Striped	103	Sea Trout	170
Bass (unspecified).....	104	Shad.....	158
Bluefish.....	105	Shark.....	159
Bluefish, Snappers	185	Sharkfin, Dried	248
Blackfish/Tautog.....	106	Sheepshead.....	247
Blowfish	228	Skate/Ray.....	160
Bonito	108	Smelt	161
Bream.....	109	Snapper.....	162
Buffalo Fish	110	Snapper blues	185
Bullhead	111	Snapper, Pink	251
Butterfish	200	Snapper, Yellowtail	250
Carp.....	112	Sole	163
Catfish (freshwater).....	113	Spot	224
Catfish (saltwater).....	114	Striped Bass.....	103
Catfish (farm-raised).....	115	Sunfish, Dried	197
Catfish (unspecified).....	116	Sunfish (unspecified).....	165
Cod.....	118	Swordfish	166
Cod, dried	239	Tautog/Blackfish.....	106
Covina, Yellow	238	Tilapia.....	168
Crappie	119	Trout	171
Doctorfish	245	Tuna, canned	174
Dolphinfish/Mahi Mahi.....	121	Tuna, fresh	175
		Turbot.....	176
		Walleye	188
		Weakfish	184
		Whitefish (freshwater).....	177
		Whitesucker	225
		Whiting (Hake)	131
		Whiting (Kingfish).....	179
		Whiting (unspecified)	180
		Other fish	181
		SHELLFISH.....CODE	
		Clams, whole (cooked)	201
		Clams, whole (raw).....	20101
		Chowder.....	20102
		Sauce.....	20103
		Strips.....	20104
		Unspecified (raw/cooked).....	20105
		Quohogs.....	20107
		Chowder/sauce unspec.....	20109
		Crab, Alaskan King Legs	216
		Crab, Blue Claw	202
		Cake.....	20201
		Salad.....	20202
		Cake/salad.....	20203
		Crab, Dungeness	218
		Crab, Rock	220
		Crab, Snow	246
		Crab, Stone	217
		Crab, Other	203
		Crawfish (freshwater).....	204
		Lobster.....	205
		Roll.....	20501
		Salad.....	20502
		Tail.....	20503
		Roll/tail/salad.....	20504
		Mussels.....	206
		Octopus.....	207
		Oysters (unspecified).....	208
		Oysters, raw	20801
		Oysters, cooked.....	20802
		Oyster stew.....	20803
		Oysters Rockefeller.....	20805
		Scallops (unspecified).....	210
		Scallops, bay.....	21002
		Scallops, sea.....	21001
		Scungilli (whelk).....	211
		Shrimp (unspecified).....	212
		Popcorn.....	21201
		Small.....	21202
		Medium.....	21203
		Large.....	21204
		Jumbo.....	21205
		Squid (Calamari).....	213
		Squid, Dried	222
		Squid, Raw	243
		Shellfish (other).....	214
		Urchin, Sea	226

Appendix 5. NCE 2-D food portion visual

Figure 1
2D Food Portion Visual



Appendix 6. Ten-day diary

RECORD OF FISH AND SEAFOOD MEALS

Write the first names of your household members in the boxes below, then answer all the questions for each person for 10 days. *When recording types of fish or seafood eaten, remember to include clam chowder, fish in stews and casseroles, breaded shrimp or fish, and tuna sandwiches.*

Use the **Food Portion Pictures** enclosed to figure out the amount of fish or seafood you eat. *Side A* can be used to describe soups, casseroles or a mound of food on a plate, such as scallops, shrimp or tuna. Use *Side B* to describe fish fillets, steaks, or whole fish. First choose a shape that is most like what you ate (A12, B3, etc.) And enter that into the 'shape code' box for question 3. Then decide on the thickness of the seafood portion using the "*thickness measure*" on Side B (3, 6, etc.), and enter that number in the 'thickness #' box for question 3. Then enter how many of that shape you ate (1, 2, 1/2, etc.) into the 'number' box for question 3.

For example, if you eat 5 pieces of fish the size of B1 with a thickness of 3, write "B1" in the shape code box, "3" in the thickness # box and "5" in the number box. If you eat a bowl of clam chowder 1/2 the size of A15, then write "A15" in the shape code box and "1/2" in the number box. See other EXAMPLES below.

If someone has more than one serving of fish or seafood per day (not including combination platters), please record the additional serving on the last page. Be sure to tell us the first name of the person and the number of the day when the additional serving was eaten, then answer the questions about that serving in the same manner.

DAY OF WEEK (Mon, Tues etc.): _____ DATE: _____

DAY 1		Example	First Name 1:	First Name 2:	First Name 3:	First Name 4:	First Name 5:	First Name 6:	First Name 7:
1. DID YOU EAT SEAFOOD TODAY?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
2a. FISH TYPE (name):		Canned tuna							
2b. CODE # (See ITEM CODE LIST)		174							
3. Amount eaten?	Shape Code	A12							
	Thickness #	—							
	Number	1							
4. HOW OBTAINED? 1 Caught by self / friend 2 Store / fish market 3 Pier 4 Roadside stand 5 Gift 6 Bartered 7 Restaurant / cafeteria 8 Soup kitchen, shelter 9 Fair / festival 10 Other (specify)		2							

5. PURCHASE FORM? 1 Prepared (soup / stew, breaded / salad / sauce / sandwich / cake); can be fresh, frozen, or canned 2 Alive 3 Fresh 4 Frozen-raw 5 Canned 6 Smoked / cured / dried / pickled 7 Other (specify)	5							
6. HOW SERVED? (Cooked=served hot/cold)	<input type="checkbox"/> Raw <input checked="" type="checkbox"/> Cooked	<input type="checkbox"/> Raw <input type="checkbox"/> Cooked	<input type="checkbox"/> Raw <input type="checkbox"/> Cooked	<input type="checkbox"/> Raw <input type="checkbox"/> Cooked	<input type="checkbox"/> Raw <input type="checkbox"/> Cooked	<input type="checkbox"/> Raw <input type="checkbox"/> Cooked	<input type="checkbox"/> Raw <input type="checkbox"/> Cooked	<input type="checkbox"/> Raw <input type="checkbox"/> Cooked
7. BREADED OR BATTERED?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
8. HOW PREPARED? 1 Baked 2 Broiled 3 Poached/boiled/steamed 4 Sauteed/stir-fried 5 Deep-fried 6 Grilled 7 Smoked 8 Microwaved 9 Soup stock 10 Salad or sandwich 11 Soup / chowder / stew / casserole 12 Other (specify)	10							
9. PARTS EATEN? (Check all that apply)	<input type="checkbox"/> Entire fish <input checked="" type="checkbox"/> Meat <input type="checkbox"/> Skin / Fins <input type="checkbox"/> Head <input type="checkbox"/> Bones <input type="checkbox"/> Eyes <input type="checkbox"/> Roe <input type="checkbox"/> Tomalley / Mustard <input type="checkbox"/> Organs	<input type="checkbox"/> Entire fish <input type="checkbox"/> Meat <input type="checkbox"/> Skin / Fins <input type="checkbox"/> Head <input type="checkbox"/> Bones <input type="checkbox"/> Eyes <input type="checkbox"/> Roe <input type="checkbox"/> Tomalley / Mustard <input type="checkbox"/> Organs	<input type="checkbox"/> Entire fish <input type="checkbox"/> Meat <input type="checkbox"/> Skin / Fins <input type="checkbox"/> Head <input type="checkbox"/> Bones <input type="checkbox"/> Eyes <input type="checkbox"/> Roe <input type="checkbox"/> Tomalley / Mustard <input type="checkbox"/> Organs	<input type="checkbox"/> Entire fish <input type="checkbox"/> Meat <input type="checkbox"/> Skin / Fins <input type="checkbox"/> Head <input type="checkbox"/> Bones <input type="checkbox"/> Eyes <input type="checkbox"/> Roe <input type="checkbox"/> Tomalley / Mustard <input type="checkbox"/> Organs	<input type="checkbox"/> Entire fish <input type="checkbox"/> Meat <input type="checkbox"/> Skin / Fins <input type="checkbox"/> Head <input type="checkbox"/> Bones <input type="checkbox"/> Eyes <input type="checkbox"/> Roe <input type="checkbox"/> Tomalley / Mustard <input type="checkbox"/> Organs	<input type="checkbox"/> Entire fish <input type="checkbox"/> Meat <input type="checkbox"/> Skin / Fins <input type="checkbox"/> Head <input type="checkbox"/> Bones <input type="checkbox"/> Eyes <input type="checkbox"/> Roe <input type="checkbox"/> Tomalley / Mustard <input type="checkbox"/> Organs	<input type="checkbox"/> Entire fish <input type="checkbox"/> Meat <input type="checkbox"/> Skin / Fins <input type="checkbox"/> Head <input type="checkbox"/> Bones <input type="checkbox"/> Eyes <input type="checkbox"/> Roe <input type="checkbox"/> Tomalley / Mustard <input type="checkbox"/> Organs	<input type="checkbox"/> Entire fish <input type="checkbox"/> Meat <input type="checkbox"/> Skin / Fins <input type="checkbox"/> Head <input type="checkbox"/> Bones <input type="checkbox"/> Eyes <input type="checkbox"/> Roe <input type="checkbox"/> Tomalley / Mustard <input type="checkbox"/> Organs
<u>IF CAUGHT FISH:</u>								
10a. WHEN? (date)								
10b. WHERE? (waterbody and nearest town)								
10c. SIZE? (fish only - inches or pounds)								

Appendix 7. Household and individual demographics survey tool

Household History

1. Check the category that best describes your household's ethnicity / race.

- | | | | |
|--|-----------------------------------|---------------------------------------|---|
| <input type="checkbox"/> White, not of Hispanic origin | <input type="checkbox"/> Filipino | <input type="checkbox"/> Laotian | <input type="checkbox"/> Mexican |
| <input type="checkbox"/> Black, not of Hispanic origin | <input type="checkbox"/> Japanese | <input type="checkbox"/> Asian Indian | <input type="checkbox"/> Puerto Rican |
| <input type="checkbox"/> American Indian/Eskimo | <input type="checkbox"/> Korean | <input type="checkbox"/> Vietnamese | <input type="checkbox"/> Central American |
| <input type="checkbox"/> Pacific Islander | <input type="checkbox"/> Thai | <input type="checkbox"/> Cambodian | <input type="checkbox"/> Dominican |
| <input type="checkbox"/> Chinese | <input type="checkbox"/> Hmong | <input type="checkbox"/> Cuban | <input type="checkbox"/> Other _____ |

2. Please check the language spoken most often in your household.

- | | | | |
|-------------------------------------|-----------------------------------|-------------------------------------|--------------------------------------|
| <input type="checkbox"/> English | <input type="checkbox"/> Italian | <input type="checkbox"/> Vietnamese | <input type="checkbox"/> Hmong |
| <input type="checkbox"/> Spanish | <input type="checkbox"/> Japanese | <input type="checkbox"/> Korean | <input type="checkbox"/> Laotian |
| <input type="checkbox"/> Portuguese | <input type="checkbox"/> Chinese | <input type="checkbox"/> Cambodian | <input type="checkbox"/> Other _____ |

3. What is the highest education level completed by the head of your household?

- | | |
|--|---|
| <input type="checkbox"/> Some high school | <input type="checkbox"/> College degree |
| <input type="checkbox"/> High school degree or GED | <input type="checkbox"/> Post-graduate degree |
| <input type="checkbox"/> Some college | <input type="checkbox"/> Other _____ |

4. Please check the range that best describes your 1995 total household income.

- | | | | |
|--|--|--|---|
| <input type="checkbox"/> \$0 - \$4,999 | <input type="checkbox"/> \$15,000 - \$19,999 | <input type="checkbox"/> \$30,000 - \$39,999 | <input type="checkbox"/> \$ 60,000 - \$69,999 |
| <input type="checkbox"/> \$5,000 - \$9,999 | <input type="checkbox"/> \$20,000 - \$24,999 | <input type="checkbox"/> \$40,000 - \$49,999 | <input type="checkbox"/> Over \$70,000 |
| <input type="checkbox"/> \$10,000 - \$14,999 | <input type="checkbox"/> \$25,000 - \$29,999 | <input type="checkbox"/> \$50,000 - \$59,999 | |

5. Do you receive Food Stamps? Yes No
6. Do you know that eating most fish or seafood is good for you? Yes No
7. Have you heard of State of Connecticut advisories about eating some types of fish? Yes No
8. Do these advisories apply to the fish you eat? Yes No Don't Know
9. Do you follow these advisories? Yes No Somewhat Don't Know
10. If no, why not? _____
11. If you wanted to know more about these advisories, do you know where to get that information? Yes No

Please Answer Questions on Back

If your household has more than seven people, please contact Doug Jann at (860) 445-3492 for more forms.

Individual Histories

Write the first names of the members of your household below, then answer all questions for each person.

	First name 1:	First name 2:	First name 3:	First name 4:	First name 5:	First name 6:	First name 7:
1. Birth date month-day-year							
2. Gender	<input type="checkbox"/> M <input type="checkbox"/> F	<input type="checkbox"/> M <input type="checkbox"/> F	<input type="checkbox"/> M <input type="checkbox"/> F	<input type="checkbox"/> M <input type="checkbox"/> F	<input type="checkbox"/> M <input type="checkbox"/> F	<input type="checkbox"/> M <input type="checkbox"/> F	<input type="checkbox"/> M <input type="checkbox"/> F
3. Height (ft, in)							
4. Weight (lbs)							
5. Pregnant?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
6. Breastfeeding?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
7. Do you ever eat fish or seafood?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
8. How often, on average, do you eat fish or seafood?							
9. Do you fish in CT fresh waters?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
10. Do you <u>eat</u> any of those fish?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
11. Do you fish or shellfish in Long Island Sound?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
12. Do you <u>eat</u> any of those fish/shellfish?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No
13. On average, how often do you go fishing/shellfishing?							
14. Do you remove the skin & fatty meat from fish you catch before cooking?	<input type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Certain fish	<input type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Certain fish	<input type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Certain fish	<input type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Certain fish	<input type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Certain fish	<input type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Certain fish	<input type="checkbox"/> Always <input type="checkbox"/> Never <input type="checkbox"/> Certain fish
15. If "certain fish", which ones?							

Appendix 8. Survey tool for Southeast Asian population

FISH NAME: _____ Date: _____

1. How often do you eat this type of fish or seafood? _____ # times per day _____ # times per week
 _____ # times per month. _____ # times per year

2. How much does each member of household eat per serving?

<u>Name</u>	<u>When Eaten</u>	<u>Shape Code</u>	<u>Thickness Code</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. Where do you usually get this fish or seafood? Catch it Buy it in store Eat it in restaurant

4. How Cooked/Prepared?

- Baked
- Broiled
- Poached / boiled or steamed
- Sauteed or stir-fried
- Deep-fried
- Grilled
- Smoked
- Microwaved
- Soup stock
- Salad or sandwich
- Soup, stew, chowder or casserole
- Raw
- Other _____

5. Parts Cooked?

- Meat / Filet
- Skin &/or Fins
- Head
- Bones
- Eyes
- Roe / Eggs
- Tomalley
- Mustard
- Organs
- Fat / Oil

6. Parts Eaten?

(In these sections, check all that apply.)

- Meat / Filet
- Skin &/or Fins
- Head
- Bones
- Eyes
- Roe / Eggs
- Tomalley
- Mustard
- Organs
- Fat / Oil

7. If fish was caught: 7a. When? (date) _____

7b. Where? (Type of waterbody & nearest town, if known) _____

7c. Size? (Fish only, inches or pounds and ounces) _____

8. If you fish, why do you fish? _____

Appendix 9. Reminder postcard

Dear Connecticut Resident:

Did you receive the survey on fish and seafood eating habits that I sent you recently? Please help me by filling the two booklets out and returning them as soon as possible. The information from your household is a very important part of this research project. Remember, you will receive a \$5.00 gift certificate to a major supermarket as my "thanks"! If you have any questions, please call me at (860) 405-9127.

Sincerely,

Nancy Balcom, Extension Educator
CT Sea Grant Marine Advisory Program
University of Connecticut

Just a Friendly Reminder . . .

Appendix 10. Pilot study survey tool

University of Connecticut

Sea Grant Marine Advisory Program
1084 Shennecossett Road
Groton CT 06340

Dear Connecticut resident,

This is a questionnaire about the different types of fish and shellfish you and other members of your household might eat. This study, the Connecticut Finfish and Shellfish Consumption Survey, is being conducted by researchers with the University of Connecticut to learn more about the types of fish and shellfish Connecticut residents eat.

We are asking people like yourself to complete this important survey. The survey covers the fish and shellfish eaten by your household during a two week period, April 14 - 27, 1996. The materials you will need to complete this survey are in the enclosed packet. They include:

- a few brief questions about yourself and your family;
- a few questions regarding how frequently you eat certain species of fish and shellfish;
- a DAILY RECORD or diary to keep track of the amount and type of fish and shellfish that you and your family eat during the weeks of APRIL 14 - 27, 1996;
- a series of questions and a list of instructions to follow in filling out the daily record;
- a list of ITEM CODES to help you record the type of fish or shellfish;
- a detailed PORTION GUIDE and PORTION ILLUSTRATIONS to help you record the amount of fish and shellfish consumed;
- A pre-paid envelope in which the diary pages and food frequency sheet should be returned. All of the instructions, portion illustrations, etc. are yours to keep.

Some of the codes are quite specific, and if you cannot provide that level of detail about the fish consumed, please provide us with as much information as you can.

The information you provide is important to the success of this project. YOUR RESPONSES WILL BE KEPT CONFIDENTIAL AND ANONYMOUS. Data from all participants will be added together before being published.

As a "thank you" we would like to enter your name into our quarterly drawing for a \$25.00 gift certificate to Stop and Shop. If you wish to be entered into this drawing, please provide your name, address and telephone number on a separate piece of paper and return it with your completed diary. We will notify you if you are a winner.

REMEMBER

- ✓ Did you complete the daily record for each day and for each person in the household?
- ✓ Did you write in the amount of fish or shellfish eaten by each person?
- ✓ Did you answer the individual and household questions?
- ✓ Did you answer the food frequency questions for each person in your household?
- ✓ Did you enclose a separate piece of paper with your name, address and telephone number on it, so that you can be entered in our quarterly drawing?

THANK YOU!

If you have any questions about this survey, please feel free to call Doug Jann at (860) 445-3492.

Sincerely,

Nancy Balcom

Connie Capacchione

Diane Hirsch

Douglas Jann

PORTION GUIDE

To determine the amount of fish or shellfish actually eaten by each person for **Q6** on the *DAILY RECORD* please follow these instructions. Whenever possible, the amounts should be determined before the item is prepared and cooked, unless it was eaten raw or obtained already cooked, as at a restaurant.

Life-size pictures of typical small, medium, large, and extra-large portions of commonly eaten fish and shellfish and their weights are provided in the enclosed *PORTION ILLUSTRATIONS* to help you determine the size of your servings. If you purchased the item, check the weight on the package label. You can also estimate the amount of the item by comparing its size to that of a deck of cards. **A portion the size of one deck of cards weighs about 3 ounces.**

Use the easiest method to estimate an amount eaten. For example:

- Weight in ounces (oz) (or pounds (lbs) and ounces) of a fish fillet or steak or seafood from a can.
- Cups (each 8 fluid ounces) of soup or stew.
- Level tablespoons (tbsp) of tuna salad in a sandwich.
- Number and size of fish sticks, shrimp in a casserole, or raw oysters.

Then enter the number of those units eaten by each person for each fish or shellfish item from **Q6**. Enter the number and size, if appropriate. For example:

- 4 oz
- 2 lbs, 6oz
- 1.5 cups
- 7 tbsp
- 12 fishsticks
- 8 large shrimp

For dishes such as clam chowder or casseroles, divide the weight or number of the fish or shellfish items used to prepare the dish by the number of portions prepared to determine the amount or number per portion. If one or more cans were used, divide the net weight(s) of the can(s) by the number of portions prepared.

For example:

- Fish fillet or steak: divide the weight of the fish by the number of persons who ate the dish to obtain the amount eaten by each person in the household.
- Shrimp: for equal-sized servings from 1 pound of "51-60 count" shrimp, divide 55 by the number of persons who ate the shrimp to obtain the number eaten by each person.
- Tuna salad sandwiches: divide the weight on the tuna can label by the number of persons who ate the tuna salad to obtain the amount eaten by each person.

Be sure to check with **each member of the household each day** to see if he or she ate any fish or shellfish. Write the best possible estimate of the amount eaten in box **Q6**. The pictures in the brochures should help.

REMEMBER:

- Record in box **Q6** only the amount actually eaten by each person.
- Adjust the portion size for children and other 'small eaters'.
- Do **not** include any portion of the item left in the serving dish or on a person's plate.

DAILY RECORD

- Q1. FISH TODAY?** Did this person eat fish or shellfish today? Check yes or no.
- Q2. WHAT KINDS?** What kinds of seafood were eaten today? (Don't forget the tuna sandwich, the clam chowder, the school lunch, or any meal eaten away from home.) Write in the names of up to four(4) seafood dishes in the numbered boxes. Please use one box for each dish. (For example: 1: *Shrimp Cocktail* / 2: *Baked Scrod* / 3: *Clam Chowder* / 4: *Fish Sticks*.) Answer questions Q2 through Q16 for each dish named in question Q1.
- Q3. ITEM NAME:** Refer to the *ITEM CODE LIST*. Find the item on the list that most closely describes the dish eaten. Write in the item name as it appears on the list.
- Q4. ITEM CODE:** Refer to the *ITEM CODE LIST*. Write in the item code number.
- Q5. WHAT MEAL?** At what meal was the dish eaten? Write in the letter of your choice.
- | | | |
|--------------|--------------|------------------|
| A. Breakfast | C. Lunch | E. Dinner/Supper |
| B. Brunch | D. Appetizer | F. Snack |
- Q6. HOW MUCH?** How much of the item was eaten? Please refer to the *PORTION GUIDE* (page x) and the *PORTION ILLUSTRATIONS* (pages x-y) to estimate total amount. Write in the amount with its unit of measure. (For example: 1: 6 medium shrimp (*Shrimp Cocktail*), 2: 8oz (*Baked Scrod*), 3: 1 cup (*Clam Chowder*), 4: 10 (*Fish Sticks*))
- Q7. WHERE EATEN?** Where was the item eaten? Write in the letter of your choice.
- | | |
|------------------------|---------------------------------|
| A. At home. (GO TO Q7) | B. Away from home (SKIP TO Q10) |
|------------------------|---------------------------------|
- Q8. FROM WHERE?** (For at home consumption only.) From where was the item purchased or obtained? Write in the letter of your choice.
- | | |
|--|--|
| A. General store (super-market, grocery store, warehouse, convenience store, commissary) | E. Roadside stand |
| B. Fish market | F. Pier |
| C. Specialty store (bakery, deli, ethnic food, health food) | G. Gift |
| D. Carryout/delivery | H. Bartered |
| | I. Caught by a member of the household |
| | J. Other (please specify) |
- Q9. WHAT STATE?** (For at home consumption only.) In what state was the item when purchased or obtained for home use? Write in the letter of your choice.
- | | |
|---------------------------|---------------------------|
| A. Alive | F. Cooked, fresh |
| B. Raw, fresh | G. Cooked, frozen |
| C. Raw, previously frozen | H. Cooked, canned |
| D. Raw, frozen | I. Other (please specify) |
| E. Raw, canned | |
- Q10. WHERE EATEN?** (For away from home consumption only.) Where was the item eaten? Write in the letter of your choice.
- | | |
|---|--|
| A. Fast food restaurant | F. Child care center, family day care home, adult day care |
| B. Restaurant with waiter/waitress | G. Other community food program |
| C. School cafeteria | H. Guest at another home |
| D. Other cafeteria/dining room (military, hospital, work, etc.) | I. Fair/festival |
| E. Soup kitchen, shelter, food pantry | J. Other (please specify) |

DAILY RECORD

Q11. WHAT FORM? In what form was the item served? Write in the letter of your choice.

- | | |
|---|---|
| A. Shellfish - shucked, peeled, picked, cleaned | D. Fish or Shellfish - soup, chowder, stew, casserole, etc. |
| B. Shellfish - not shucked, peeled, picked, cleaned | E. Fish - fillet or steak |
| C. Fish or Shellfish - salad or sandwich | F. Fish - dressed (guttled) |
| | G. Fish - whole (not gutted) |
| | H. Other (please specify) |

Q12. BREADED? Was the item breaded, floured, or battered? Write in the letter of your choice.

- | | |
|--------|-------|
| A. Yes | B. No |
|--------|-------|

Q13. PARTS EATEN: What parts of the item were eaten? Choose all that apply from the list below. Write in the letter(s) of your choice.

- | | |
|---|--|
| For fish: | For shellfish: |
| A. Whole fish (all parts) | H. Whole (not picked, shucked) |
| B. Meat (filet, steak, fish sticks, etc.) | I. Picked, shucked meat or imitation seafood (plain, breaded, or in cakes) |
| C. Skin | J. Mustard (crab) |
| D. Head | K. Tomalley (lobster) |
| E. Organs | L. Fat (crawfish) |
| F. Roe (eggs) | M. Other (please specify) |
| G. Other (please specify) | |

Q14. COOKING: How was the item cooked? Write in the letter of your choice.

- | | | |
|--------------------|---------------|---------------------------|
| A. Not cooked, raw | F. Baked | K. Pickled |
| B. Boiled | G. Steamed | L. Sauteed (pan-fried) |
| C. Deep-fried | H. Poached | M. Cooked, eaten cold |
| D. Broiled | I. Microwaved | N. Other (please specify) |
| E. Grilled | J. Smoked | |

Q15. DATE: If the fish or shellfish was caught by a member of the household, please write in the date it was caught (month/year).

Q16. LOCATION: If the fish or shellfish was caught by a member of the household, please write in the name of the body of water from which it was taken.

Q17. WEIGHT: (For fish only) If the fish was caught by a member of the household, please write in the weight of the whole fish (ie. before gutting) in pounds(lbs) and ounces(oz). If you are uncertain about the weight of the fish, please make your best guess.

FISH AND SHELLFISH DIARY

A. Please write in the name of each person in your household, from eldest to youngest. Enter one name in each space. (If you have more than five(5) persons in your household, complete the diary for only the five eldest members of the household, regardless of how often (if ever) these people eat seafood.) Fill in one column of the table for each person in the household.

	Name of person 1:	Name of person 2:	Name of person 3:	Name of person 4:	Name of person 5:
AGE (Years)					
GENDER (Male/Female)					
HEIGHT (Feet & inches)					
WEIGHT (Pounds)					
PREGNANT (Yes/No)					
BREASTFEEDING (Yes/No)					
Does this person participate in fishing or shellfishing activities in CT? (Yes/No)					
If yes, where? (Choose one)	<input type="checkbox"/> Freshwater <input type="checkbox"/> Saltwater <input type="checkbox"/> Both	<input type="checkbox"/> Freshwater <input type="checkbox"/> Saltwater <input type="checkbox"/> Both	<input type="checkbox"/> Freshwater <input type="checkbox"/> Saltwater <input type="checkbox"/> Both	<input type="checkbox"/> Freshwater <input type="checkbox"/> Saltwater <input type="checkbox"/> Both	<input type="checkbox"/> Freshwater <input type="checkbox"/> Saltwater <input type="checkbox"/> Both

B. Check the category below that best describes your household's ethnic/racial status. If more than one category applies, choose the one that most clearly reflects the household's recognition in the community.

- Asian () Native American Indian ()
 Hispanic () White, not of hispanic origin ()
 African American, not of hispanic origin.. () Other (please specify) _____ ()
 Carribean Islander ()

C. Check the primary language spoken in your household.

- English () Italian () Vietnamese..... () Hmong..... ()
 Spanish () Japanese..... () Korean () Lao ()
 Portuguese..... () Chinese () Cambodian () Other ()

D. Please check the range that describes your 1995 total annual household income.

- Under \$10,000 () \$40,000 - \$49,999 ()
 \$10,000 - \$19,999 () \$50,000 - \$59,999 ()
 \$20,000 - \$29,999 () \$60,000 - \$69,999 ()
 \$30,000 - \$39,999 () Over \$70,000 ()

E. Please indicate the highest level of formal education represented in the household.

- Less than 9th grade () Some college, no degree ()
 High School, no diploma () Associate/Bachelor's degree ()
 High School/G.E.D. () Graduate/Professional degree... ()

TODAY'S DATE: _____

PERSON 1	Q2 What kinds?	Q3 Item name:	Q4 Item code:	Q5 What meal?	Q6 How much?	Q7 Where eaten?	Q8 From where?	Q9 What state?	Q10 Where eaten?	Q11 What form?	Q12 Breaded?	Q13 Parts eaten?	Q14 Cooking?	Q15 Date?	Q16 Location?	Q17 Weight?
NAME:	1.															
	2.															
Q1: Fish today?	3.															
()yes ()no	4.															
PERSON 2	Q2 What kinds?	Q3 Item name:	Q4 Item code:	Q5 What meal?	Q6 How much?	Q7 Where eaten?	Q8 From where?	Q9 What state?	Q10 Where eaten?	Q11 What form?	Q12 Breaded?	Q13 Parts eaten?	Q14 Cooking?	Q15 Date?	Q16 Location?	Q17 Weight?
NAME:	1.															
	2.															
Q1: Fish today?	3.															
()yes ()no	4.															
PERSON 3	Q2 What kinds?	Q3 Item name:	Q4 Item code:	Q5 What meal?	Q6 How much?	Q7 Where eaten?	Q8 From where?	Q9 What state?	Q10 Where eaten?	Q11 What form?	Q12 Breaded?	Q13 Parts eaten?	Q14 Cooking?	Q15 Date?	Q16 Location?	Q17 Weight?
NAME:	1.															
	2.															
Q1: Fish today?	3.															
()yes ()no	4.															
PERSON 4	Q2 What kinds?	Q3 Item name:	Q4 Item code:	Q5 What meal?	Q6 How much?	Q7 Where eaten?	Q8 From where?	Q9 What state?	Q10 Where eaten?	Q11 What form?	Q12 Breaded?	Q13 Parts eaten?	Q14 Cooking?	Q15 Date?	Q16 Location?	Q17 Weight?
NAME:	1.															
	2.															
Q1: Fish today?	3.															
()yes ()no	4.															
PERSON 5	Q2 What kinds?	Q3 Item name:	Q4 Item code:	Q5 What meal?	Q6 How much?	Q7 Where eaten?	Q8 From where?	Q9 What state?	Q10 Where eaten?	Q11 What form?	Q12 Breaded?	Q13 Parts eaten?	Q14 Cooking?	Q15 Date?	Q16 Location?	Q17 Weight?
NAME:	1.															
	2.															
Q1: Fish today?	3.															
()yes ()no	4.															

NAME OF PERSON 1: _____	Do you ever eat this type of seafood? (Yes/No)	What size portion do you typically eat? (Small, Medium, Large)	During what season(s) do you typically eat this type of seafood? (Winter, Spring, Summer, Fall)	How often do you eat this type of seafood? (Number of times per day, week, month, or year)	Did this seafood come from Long Island Sound? (Yes, No, or Don't know)
LOBSTER					
BLUEFISH					
STRIPED BASS					
EEL					
BLACKFISH/AUTOG					
PORGY/SCUP					
MUSSELS					
OYSTERS					
CLAMS					
SCALLOPS					
NAME OF PERSON 2: _____	Do you ever eat this type of seafood? (Yes/No)	What size portion do you typically eat? (Small, Medium, Large)	During what season(s) do you typically eat this type of seafood? (Winter, Spring, Summer, Fall)	How often do you eat this type of seafood? (Number of times per day, week, month, or year)	Did this seafood come from Long Island Sound? (Yes, No, or Don't know)
LOBSTER					
BLUEFISH					
STRIPED BASS					
EEL					
BLACKFISH/AUTOG					
PORGY/SCUP					
MUSSELS					
OYSTERS					
CLAMS					
SCALLOPS					
NAME OF PERSON 3: _____	Do you ever eat this type of seafood? (Yes/No)	What size portion do you typically eat? (Small, Medium, Large)	During what season(s) do you typically eat this type of seafood? (Winter, Spring, Summer, Fall)	How often do you eat this type of seafood? (Number of times per day, week, month, or year)	Did this seafood come from Long Island Sound? (Yes, No, or Don't know)
LOBSTER					
BLUEFISH					
STRIPED BASS					
EEL					
BLACKFISH/AUTOG					
PORGY/SCUP					
MUSSELS					
OYSTERS					
CLAMS					
SCALLOPS					
NAME OF PERSON 4: _____	Do you ever eat this type of seafood? (Yes/No)	What size portion do you typically eat? (Small, Medium, Large)	During what season(s) do you typically eat this type of seafood? (Winter, Spring, Summer, Fall)	How often do you eat this type of seafood? (Number of times per day, week, month, or year)	Did this seafood come from Long Island Sound? (Yes, No, or Don't know)
LOBSTER					
BLUEFISH					
STRIPED BASS					
EEL					
BLACKFISH/AUTOG					
PORGY/SCUP					
MUSSELS					
OYSTERS					
CLAMS					
SCALLOPS					
NAME OF PERSON 5: _____	Do you ever eat this type of seafood? (Yes/No)	What size portion do you typically eat? (Small, Medium, Large)	During what season(s) do you typically eat this type of seafood? (Winter, Spring, Summer, Fall)	How often do you eat this type of seafood? (Number of times per day, week, month, or year)	Did this seafood come from Long Island Sound? (Yes, No, or Don't know)
LOBSTER					
BLUEFISH					
STRIPED BASS					
EEL					
BLACKFISH/AUTOG					
PORGY/SCUP					
MUSSELS					
OYSTERS					
CLAMS					
SCALLOPS					

EXTRA LARGE

More than 7 ounces

Fish Fillet
8 ounces

Center Cut Fish Steak
8 ounces

Fish Steak
8 ounces

Extra Large Shrimp
(16-20 count, 20lb)
0.8 ounce

Appendix 11. Angler sample size methodology for compiling a randomized, representative database of marine anglers, and the results of that strategy (developed and written by Doug Jann)

As a group, Connecticut marine sport anglers fish throughout Long Island Sound during all seasons and all hours of the day and night. Their fishing modes can be categorized as shored-based trips (SA), private/rental vessel trips (PV), and party/charter vessel trips (CH). Access to fishing grounds varies, from completely open public access to privately owned. The National Marine Fisheries Service (NMFS) estimated that 68% of the marine sport fishing trips in the North Atlantic subregion in 1991 were private vessel trips, 27% were shore-based trips, and 5% were charter or party boat trips, with 60 percent of the catch from inshore waters (Anon., 1992). NMFS statistics also show that anglers on private vessel and charter vessel trips tend to catch more fish more often than shored-based anglers (Essig *et al.*, 1991). For example, in 1987, 76.5 % of the fish caught in the North Atlantic subregion were caught during private vessel trips, averaging 6.3 fish per trip. Shore-based fishing activities caught 5.7 million fish, averaging 3.6 fish per trip, and charter vessel trips caught 2.7 million fish, or 6.7 fish per trip. This could make them more susceptible to exposure to contaminants, however shored-based anglers may be fishing in areas (e.g. harbors) where industrial contaminants are more prevalent.

To create a uniform, random sample representative of the Connecticut marine recreational angler population, it would have been desirable to proportionally represent all fishing "platforms," and degrees of accessibility to fishing opportunities uniformly cross all hours of the day, seasons of the year, and geographical locations. However, manpower limitations, safety considerations, and project objectives dictated certain restrictions in the sampling effort.

A primary consideration was to collect the largest possible mailing list of anglers with the limited resources available, in the shortest time frame possible. To maximize manpower effort, sampling was limited to the summer season when fishing pressure is greatest, to locations known to be popular with anglers, and concentrated primarily on weekends. Individually owned, private properties were excluded entirely from the sampling design because they did not meet the high traffic requirement. For the safety of personnel, sampling was not conducted at night or in locations deemed "hostile" by local conservation officers. As such, for these reasons, early season, late season, nocturnal anglers, or anglers that choose out of the way or "hostile" locations for their fishing trips may not be represented in the sample.

Methods

SITE SELECTION

The sample of Connecticut marine sport anglers collected depended on the sites chosen to include in the field survey. The sites were chosen to comprise a representative cross-section of fishing opportunities in Connecticut, while satisfying our sampling requirements listed previously. The factors considered in choosing the sites were:

- a) Does the site receive enough fishing pressure that field personnel would have a fair chance of encountering anglers to interview at the times scheduled?
- b) Do the sites chosen represent all three fishing "platforms" —shore-based trips, private vessel trips and charter or party boat trips?
- c) Do the sites represent a range of public access opportunities?
- d) Are the sites evenly distributed along the entire Connecticut shoreline?

All sites were selected from the Connecticut 1995 Marine Recreational Fisheries Statistics Survey Master Site Register, maintained by the CT DEP, Marine Fisheries Division, for the NMFS. The Master Site Register rates fishing pressure on a 10-point scale at 274 established sites. Each site is rated by month (January – December), stratum (weekend and weekday), and mode/platform (SA, PV, CH). All sites used in this study were assigned their corresponding Master Site Register number.

From this list, all sites with acceptable fishing pressure in at least one mode during June, July, and August were identified for the weekend stratum. Sites were simultaneously selected for mode and geographical distribution to create a representative preliminary weekend stratum site list. Forty sites were

eventually chosen. From those 40 sites, 20 provided sufficient weekday fishing pressure and were chosen for the weekday stratum.

Permission was obtained from the appropriate authority to conduct a survey at each site. This process also helped determine the nature of ownership at each site, and allowed assessment of whether all degrees of public accessibility had been incorporated into the site selections.

SCHEDULING

Sampling was to be conducted during a 12-week period from June through August, to coincide with the summertime peak in fishing effort. Weeks were divided into two strata: weekends (Saturday & Sunday) and weekdays (Monday through Friday). All days within a stratum were considered equivalent. To assure uniform sampling throughout the day, days were divided into three time blocks of five hours each: Block A (0600h-1100h), Block B (1100h-1600h), and Block C (1600h – 2100h). No sampling was done between 2100h and 0600h.

To facilitate scheduling, sites were assigned by geographical proximity into groups of five, which were called loops. Loops were to be completed in five hour time blocks, with one hour (minus travel time between sites) being dedicated to each of the five sites. Eight loops were constructed for the weekend stratum, and four loops for the weekday stratum.

Within the weekday stratum, each loop was scheduled to be completed three times in each of the three time blocks (Table 1). Each of the 20 weekday sites would be sampled nine times in the course of the 12-week sampling period, 180 site visits in all. Within the weekend stratum, loops were disproportionately assigned to the time blocks. Assuming that the weekday midday time block was the best time to intercept the greatest number of anglers, coverage of this period was maximized. Each of the eight weekend loops were scheduled to be completed either five or six times in Block B, while being completed only two to three times (with one exception of four times) in both Blocks A and C. Each of the 40 weekend sites were to be sampled 10-11 times over the 12-week sampling period (Table 2). A total of 205 sites were to be sampled in Block B, and 105 sites in each of Block A and Block C, for a total of 415 weekend sites in a 12-week period. Overall, names and addresses would be collected during 595 visits to the sites selected during the sample period (Table 3).

The sampling design called for 310 shore-based angler sites to be visited over the course of the 12 week period, along with 256 private vessel sites, and 29 charter/party boat sites (Table 4).

SURVEY FORM (INITIAL)

The angler survey was initially designed to produce a mailing list of a representative, random sample of anglers. The information sought during the initial sets of field interviews with anglers included basic demographic information, questions regarding the state's fish consumption advisories, and several questions on the types of fish eaten, and how often.

INTERVIEW PROCEDURE

Upon arrival at a site, the interviewer would make a head count of anglers present. The head count was used to determine how anglers were selected for interviewing. If the interviewer determined that there was enough time to interview all anglers present at the site, he/she would begin with the first angler encountered, and continue the interviews in sequence, until all anglers had been approached.

If there were more anglers present than could be interviewed in the portion of the hour remaining, then the interviewer would divide the head count by the number of interviews they could complete in the time remaining, with a resulting value of N. The interviewer would speak with every Nth angler in consecutive sequence, until the last Nth angler had been approached.

If a selected angler refused to participate in the interview, had been previously interviewed, or did not qualify for an interview (e.g. out-of-state angler), the interviewer would move on to the next angler, and begin the count to the next Nth angler from that point.

To help increase the sample size, the interviewers were directed to interview anyone who appeared to be participating in a Long Island Sound fishery, regardless of whether they were encountered at an assigned site, or encountered incidentally while traveling between sites.

Table 1. Sampling plan for weekday stratum, showing loops by site number and site location. Each site was to be visited nine times, three times each during Blocks A (0600h-1100h), B (1100h-1600h) and C (1600h-2100h).

Loop No.	Site No.	Site
11	62	Norwalk Town Ramp
	64	Calf Pasture Point
	89	Fairfield Town Launch/Marina
	92	St Maries Town Beach
	128	Stratford Town Launch Area
12	215	Milford Town Launch/Wilcox Park
	297	Milford Harbor West Jetty
	235	Sandy Point, West Haven
	263	Branford Point Town Pier
	267	Branford River State Boat Launch
13	291	Hammonasset State Park, Madison
	436	Cornfield Point, Old Saybrook
	825	I-95 Launch, Old Saybrook
	604	Ferry Tavern, DEP Marine Headquarters
	607	State Launch-Great Island, Old Lyme
14	626	Hole in the Wall Beach, Niantic
	638	Capt John's Fishing Center, Waterford
	645	Niantic State Boat Launch, Niantic/Waterford
	828	Dock Road, Waterford
	646	Harkness Memorial State Park, Waterford

REVISIONS TO PROCEDURES

A number of changes were made in the method of interviewing anglers in the field. These revisions were based on the preliminary results of the first few weeks of sampling. After week four, some sites were eliminated from the sampling schedule due to lack of activity, and additional new sites were added to replace them. Starting with week five, the interviewers were asked to collect a complete food frequency from the angler in the field whenever possible. The survey would still be mailed to the angler's household for data on the rest of the family, however, it was felt that it would be important to get information on the angler during an interview whenever possible, in case that angler decided not to fill out and return the mail survey at a later date.

This increased the interview time, particularly early on, when the interviewers were getting used to asking the food frequency questions efficiently. As a result, the interview procedures were modified in the following manner. If a site was found deserted upon arrival, the interviewer would proceed to the next site. If after all five scheduled sites had been visited, and time in the five-hour sampling block remained, the interviewer was instructed to proceed to which ever site he/she thought might have anglers present to continue interviewing until the end of the time block.

The random selection procedure for choosing an angler to interview was changed. If only a few anglers were present, the interviewer was instructed to select the 50th angler at the site, counting from 1 to N, and then returning to the beginning of the sequence until the count of 50 was reached. If there were many anglers present, the interviewer was instructed to use the same counting technique, except that he/she was to count to a denomination of 50 that permitted him/her to count through the field several times before the end of the count was reached. An angler's chance of being selected depended on the precise number of anglers present at the site, and the point at which the count began, both of which are random variables.

After the sixth week of interviews, 12 additional weekday loops were scheduled into the remaining six weeks, to increase the number of anglers interviewed. Loop length was shortened to four hours, to be completed at any time during a five-hour time block.

Table 2. Sampling plan for weekend stratum, showing loops by site number, site location, and number of times scheduled to be visited by time block. Block A is 0600h-1100h; Block B is 1100h-1600h; and Block C is 1600h – 2100h.

Loop No.	Site No.	Site	No. Visits: Block A	No. Visits: Block B	No. Visits: Block C
1	3	Byram Park, Byram	2	5	3
	4	Grass Island, Greenwich	2	5	3
	23	Cummings Beach Park, Stamford	2	5	3
	62	Norwalk Town Ramp, Norwalk	2	5	3
	64	Calf Pasture Point, Norwalk	2	5	3
2	76	Sherwood Island State Park, Westport	3	5	3
	85	Penfield Reef, Fairfield	3	5	3
	89	Fairfield Town Paunch/Marina, Fairfield	3	5	3
	92	St Maries Town Beach, Bridgeport	3	5	3
	123	Lordship Beach, Stratford	3	5	3
3	128	Town Launch Area, Stratford	3	5	3
	130	Stratford Town Dock & Launch, Stratford	3	5	3
	297	Milford Harbor West Jetty, Milford	3	5	3
	215	Milford Town Launch/Wilcox Park, Milford	3	5	3
	218	Gulf Beach/Milford Harbor East Jetty, Milford	3	5	3
4	235	Sandy Point, West Haven	2	5	4
	251	Fort Hale Park Wharf/Fishing Pier, E Haven	2	5	4
	254	Lighthouse Park/Boat Launch, East Haven	2	5	4
	263	Branford Point Town Pier, Branford	2	5	4
	267	Branford River State Boat Launch, Branford	2	5	4
5	287	West Wharf, Madison	3	5	2
	291	Hammonasset State Park, Madison	3	5	2
	826	Clinton Town Launch, Clinton	3	5	2
	436	Cornfield Point, Old Saybrook	3	5	2
	825	I-95 Launch, Old Saybrook	3	5	2
6	604	Ferry Tavern, DEP Marine Hdqtrs, Old Lyme	2	6	2
	607	State Launch-Great Island, Old Lyme	2	6	2
	616	State Launch-Four Mile River, Old Lyme	2	6	2
	617	Rocky Neck State Park, East Lyme	2	6	2
	638	Capt John's Fishing Center, Waterford	2	6	2
7	626	Hole in the Wall Beach, Niantic	3	5	2
	645	Niantic State Boat Launch, Niantic/Waterford	3	5	2
	800	Black Hawk II-Niantic River, Waterford	3	5	2
	828	Dock Road, Waterford	3	5	2
	646	Harkness Memorial State Park, Waterford	3	5	2
8	657	New London City Pier, New London	3	5	2
	673	Bayberry Lane State Launch, Groton	3	5	2
	697	Beebe Cove Marina, Noank	3	5	2
	717	Shaffer's Boat Livery, Mystic	3	5	2
	737	Barn Island State Launch, Stonington	3	5	2

Table 3. Number of sites scheduled by stratum and block. Block A is 0600h-1100h; Block B is 1100h – 1600h; and Block C is 1600h-2100h.

Sampling Stratum	Blocks			Total
	A	B	C	
Weekday	60	60	60	180
Weekend	105	205	105	415
Total	165	265	165	595

Table 4. Number of sites to be visited, by mode, stratum, and block. Block A is 0600h-1100h; Block B is 1100h-1600h; and Block C is 1600h-2100h.

Time Block	Weekend				Weekday				Total
	SA	PV	CH	Total	SA	PV	CH	Total	
A	56	44	5	105	30	27	3	60	165
B	107	87	11	205	30	27	3	60	265
C	57	44	4	105	30	27	3	60	165
Total	220	175	20	415	90	81	9	180	595

When the 12-week sampling period for field interviews with anglers ended, a total of 320 sites had been visited during the weekends, 77.1% of the 415 scheduled (Table 5). During the weekdays, 142 sites were visited, or 78.9% of the 180 scheduled (Table 6). An additional 74 unscheduled sites were visited during the weekdays, when activity at each individual site was quieter (Table 6). In total, 536 sites were visited during the 12-week period, 90.1% of the 595 scheduled (Table 7).

Table 5. Number of sites actually visited in the weekend stratum by site and block. Block A is 0600h-1100h; Block B is 1100h – 1600h; Block C is 1600h – 2100h.

Loop No.	Site No.	Site	No. Visits:	No. Visits:	No. Visits:	Total
			Block A	Block B	Block C	
1	3	Byram Park, Byram	2	4	2	8
	4	Grass Island, Greenwich	2	4	2	8
	23	Cummings Beach Park, Stamford	2	4	2	8
	42	South Norwalk Boat Club, S Norwalk	2	2	2	6
	62	Norwalk Town Ramp, Norwalk	2	4	2	8
2	64	Calf Pasture Point, Norwalk	2	3	2	7
	76	Sherwood Island State Park, Westport	2	2	3	7
	85	Penfield Reef, Fairfield	3	2	3	8
	89	Fairfield Town Paunch/Marina, Fairfield	3	2	3	8
	92	St Maries Town Beach, Bridgeport	3	2	3	8
3	123	Lordship Beach, Stratford	2	3	2	7
	128	Town Launch Area, Stratford	2	2	2	6
	130	Stratford Town Dock & Launch, Stratford	0	1	1	2
	133	Stratford Marina & Yacht Club, Stratford	2	2	2	6
	297	Milford Harbor West Jetty, Milford	2	2	2	6
	215	Milford Town Launch/Wilcox Park	2	2	2	6
	218	Gulf Beach/Milford Harbor East Jetty	2	2	2	6
4	911		2	1	0	2
	235	Sandy Point, West Haven	1	3	2	7
	237	West Haven Yacht Club, West Haven	2	2	2	6
	251	Fort Hale Park Wharf Pier, East Haven	2	2	1	5
	254	Lighthouse Park/Boat Launch, E Haven	2	2	2	6
	263	Branford Point Town Pier, Branford	2	2	2	6
	267	Branford River State Boat Launch	2	2	2	6
5	283	Guilford Marina & Launch, Guilford	2	1	2	5
	287	West Wharf, Madison	2	2	2	7
	291	Hammonasset State Park, Madison	3	2	2	7
	826	Clinton Town Launch, Clinton	3	2	2	7
	436	Cornfield Point, Old Saybrook	3	1	0	1
	825	I-95 Launch, Old Saybrook	0	2	2	7
	604	Ferry Tavern, DEP Hdqtrs, Old Lyme	3	5	2	9
6	607	State Launch-Great Island, Old Lyme	2	5	2	9
	609	Black Hall Marina/River Bank, Old Lyme	2	3	2	7
	616	State Launch-Four Mile River, Old Lyme	2	3	0	3
	617	Rocky Neck State Park, East Lyme	0	4	2	8
	638	Capt John's Fishing Center, Waterford	2	4	2	8
	626	Hole in the Wall Beach, Niantic	2	0	2	3
	645	Niantic State Boat Launch, Nian/Wtrford	1	4	2	8
7	800	Black Hawk II-Niantic River, Waterford	2	4	2	8
	828	Dock Road, Waterford	2	4	2	8
	646	Harkness Memorial State Park, Waterford	2	4	2	8
	657	New London City Pier, New London	2	7	2	11
	672	Spicer's Marina, Groton	2	2	2	6
8	673	Bayberry Lane State Launch, Groton	3	3	2	8
	697	Beebe Cove Marina, Noank	1	3	0	4
	717	Shaffer's Boat Livery, Mystic	3	4	2	9
	725	Cardinal Cove Marina, Stonington	2	3	2	7
	737	Barn Island State Launch, Stonington	3	4	2	9
	Total No. of Sites			97	133	90

Table 6-. Number of sites actually visited in the weekday stratum by site and block. Block A is 0600h-1100h; Block B is 1100h – 1600h; Block C is 1600h – 2100h.

Loop No.	Site No.	Site	No. Visits: Block A	No. Visits: Block B	No. Visits: Block C	Total
11	42	South Norwalk Boat Club, S Norwalk	1	2	1	4
	62	Norwalk Town Ramp	2	2	2	6
	64	Calf Pasture Point	2	1	2	5
	89	Fairfield Town Launch/Marina	2	2	2	6
	92	St Maries Town Beach	2	2	2	6
	128	Stratford Town Launch Area	1	2	4	7
12	215	Milford Town Launch/Wilcox Park	2	2	4	8
	297	Milford Harbor West Jetty	2	1	3	6
	235	Sandy Point, West Haven	2	2	4	8
	263	Branford Point Town Pier	1	2	4	7
	267	Branford River State Boat Launch	2	2	4	8
13	291	Hammonasset State Park, Madison	2	2	2	6
	283	Guilford Marina & Launch, Guilford	2	2	2	6
	436	Cornfield Point, Old Saybrook	1	1	0	2
	825	I-95 Launch, Old Saybrook	2	2	2	6
	604	Ferry Tavern, DEP Marine Headquarters	2	2	2	6
	607	State Launch-Great Island, Old Lyme	2	2	2	6
14	626	Hole in the Wall Beach, Niantic	0	1	1	2
	638	Capt John's Fishing Center, Waterford	2	2	2	6
	645	Niantic State Boat Launch, Nian/Wtrford	2	5	2	9
	672	Spicer's Marina, Groton	2	3	2	7
	828	Dock Road, Waterford	2	4	3	9
	646	Harkness Memorial State Park, Waterford	0	4	2	6
Total No. Scheduled Weekday Sites			38	50	54	142
Unscheduled Weekday Sites						
NA	3	Byram Park, Byram	1	1	0	2
	4	Grass Island, Greenwich	1	1	0	2
	23	Cummings Beach Park, Stamford	1	1	0	2
	76	Sherwood Island State Park, Westport	2	1	0	3
	85	Penfield Reef, Fairfield	2	1	0	3
	123	Lordship Beach, Stratford	2	2	0	4
	130	Stratford Town Dock & Launch, Stratford	1	0	1	2
	133	Stratford Marina & Yacht Club, Stratford	1	0	2	3
	218	Gulf Beach/Milford Harbor East Jetty	1	1	4	6
	237	West Haven Yacht Club, West Haven	0	1	0	1
	251	Fort Hale Park Wharf Pier, East Haven	1	0	1	2
	254	Lighthouse Park/Boat Launch, E Haven	0	0	3	3
	287	West Wharf, Madison	1	2	2	5
	609	Black Hall Marina/River Bank, Old Lyme	0	0	2	2
	617	Rocky Neck State Park, East Lyme	1	0	3	4
	657	New London City Pier, New London	1	3	0	4
	673	Bayberry Lane State Launch, Groton	1	3	1	5
	717	Shaffer's Boat Livery, Mystic	1	3	0	4
	725	Cardinal Cove Marina, Stonington	1	3	0	4
	737	Barn Island State Launch, Stonington	1	3	0	4
	800	Black Hawk II-Niantic River, Waterford	1	3	0	4
	826	Clinton Town Launch, Clinton	1	01	2	4
	911		1	0	0	1
Total No. of Sites Unscheduled			23	30	21	74
Total No. Sites Weekdays			61	80	75	216

Table 7. Number of sites actually visited by stratum and block.

Sampling Stratum	Time Block			TOTAL
	A	B	C	
Weekday Scheduled	38	50	54	142
Weekday Unscheduled	23	30	21	74
Weekend	97	133	90	320
Total	158	213	165	536

Table 8. Number of sites per mode of fishing. PV=private vessel, SA=shore-based angler, and CH=charter vessel.

Mode	No. of Sites
PV	25
SA	21
CH	2
Total	48

Table 9. Number of sites by type of access.

Type of Access	No. of Sites
Public Access	29
Town Facility	14
Private Club	5
Total	48

Table 10. Number of sites by type of fishing opportunity.
(Some sites had multiple opportunities, resulting in the higher site total.)

Type of Fishing Opportunity	No. of Sites
Marina	12
Boat Launch	17
Pier	12
Beach	14
TOTAL	55

Table 11. Number of sites by fishing opportunity and access. (Some sites had multiple opportunities, resulting in the higher site total.)

Type of Fishing Opportunity	Public Access	Town Facility	Private Club	Type of Access TOTAL
Marine	3	5	4	12
Boat Launch	10	7	0	17
Pier	8	4	0	12
Beach	10	3	1	14
Total	31	19	5	55

Table 12. Number of sites per mode and type of access.

Type of Access	Private Vessel	Shore-Based	Charter Vessel	Mode Total
Public Access	13	14	2	29
Town Facility	8	6	0	14
Private Club	4	1	0	5
Total	25	21	2	48

Table 13. Number of sites visited, by mode, stratum, and block.

Block	Weekend				Weekday				Total
	SA	PV	CH	Total	SA	PV	CH	Total	
A	39	54	4	97	27	31	3	61	158
B	53	72	8	133	29	47	4	80	213
C	39	47	4	90	30	44	1	75	165
Total	131	173	16	320	86	122	8	216	536

Appendix 12. Income level and household size used to determine limited income population

CT Department of Social Services - May 21, 1998 - Personal Communication

Determination of Low Income Group

If family has never been on assistance before, then maximum income household can earn is:

- 1 person - \$457/month or \$5,484/year
- 2 persons - \$607/month or \$7,284/year
- 3 persons - \$745/month or \$8,940/year
- 4 persons - \$876/month or \$10,512/year
- 5 persons - \$1,002/month or \$12,024/year
- 6 persons - \$1,134/month or \$13,608/year
- 7 persons - \$1,279/month or \$15,348/year
- 8 persons - \$1,413/month or \$16,956/year
- 9 persons - \$1,530/month or \$18,360/year

Once qualified for assistance, they can earn an additional amount up to 100% of poverty level, which is:

- 1 person - \$671/month
- 2 persons - \$905/month
- 3 persons - \$1,138/month
- 4 persons - \$1,371/month
- 5 persons - \$1,605/month
- 6 persons - \$1,838/month
- 7 persons - \$2,071/month
- 8 persons - \$2,305/month
- 9 persons - \$2,539/month

Maximum total per month that can be earned and still qualify for assistance:

- 1 person - \$1,128/month or \$13,536/year
- 2 persons - \$1,512/month or \$18,144/year
- 3 persons - \$1,883/month or \$22,596/year
- 4 persons - \$2,247/month or \$26,964/year
- 5 persons - \$2,607/month or \$31,284/year
- 6 persons - \$2,972/month or \$35,664/year
- 7 persons - \$3,350/month or \$40,200/year
- 8 persons - \$3,718/month or \$44,616/year
- 9 persons - \$4,069/month or \$48,828/year

WIC Income Eligibility (Period of April 12, 1998 – June 30, 1999)**

FAX communication June 3, 1998

Family Size	Annual Income
1	14,893
2	20,073
3	25,253
4	30,433
5	35,613
6	40,793
7	45,973
8	51,153
9	56,333

This study's assumptions in developing limited income population:

Any household earning >\$70,000 was eliminated from consideration.
Any WIC/EFNEP household with income missing was included in limited income population

Using the following household size and income levels (based on income ranges listed in household history) and adjusting down the WIC/Social Services levels slightly to better reflect 1996-97 income eligibility requirements, the limited income population was derived:

Household Size	Income
1	<\$14,999
2	<\$19,999
3	<\$19,999
4	<\$24,999
5	<\$29,999
6	<\$39,999
7	<\$49,999
8	<\$49,999
9	<\$49,999

Appendix 13. Harvester survey



Connecticut Seafood Disposition Survey II

The purpose of this survey is to determine how much seafood (finfish, shellfish and crustaceans) harvested from *Long Island Sound* is available to Connecticut consumers (either through wholesale markets, retail markets, restaurants or institutions). **Please fill out this form as accurately as possible and return it in the post-paid envelope by July 15, 1997.** Thank you for your help.

Name of company/ individual (*optional*): _____

PLEASE PRINT OR TYPE CLEARLY

(Use the 1996 calendar year as the basis for your information.)

1. Do you harvest any seafood (finfish, shellfish, crustaceans) in **Long Island Sound**?

Yes No

If "yes", please continue. If "no", stop here and return survey in envelope provided.

2. If "yes", which species? (Please list)

3. Do you routinely sell any **Long Island Sound** seafood to dealers, wholesalers, retailers, restaurants or institutions in Connecticut?

Yes No

(Continued on back)

4. If "yes", please list the species harvested from Long Island Sound that you sell in Connecticut in the left-hand column below. In the second column, indicate to whom they are sold (restaurant, wholesaler...). In the third column, please indicate for each species, the percent of your total harvest of that species from Long Island Sound that is sold in Connecticut. In the fourth column, please indicate the number of pounds or bushels that percentage represents, if the numbers are available. See example below.

<u>Species:</u>	<u>Sold to:</u>	<u>Percent:</u> (100%, < 5%, 25%, ...)	<u>Amount:</u> (Pounds, bushels, ...)
Ex. Hard Clams	Restaurants & retailers	25%	100 bushels

Please return your survey in the pre-paid envelope provided. Thank you for your assistance!

Appendix 14. Retailer/restaurant survey



Connecticut Seafood Disposition Survey I

The purpose of this survey is to determine how much seafood (finfish, shellfish and crustaceans) harvested from *Long Island Sound* is available to Connecticut consumers (either through wholesale markets, retail markets, restaurants or institutions). Please fill out this form as accurately as possible and return it in the post-paid envelope by *July 15, 1997*. Thank you for your help.

Name of company/individual (*optional*): _____

PLEASE PRINT OR TYPE CLEARLY

1. What is your seafood operation? (Check as many as apply)

Wholesaler Reshipper/Packer Retailer Restaurant

Other _____

2. Do you purchase, sell, and/or serve any seafood (finfish, shellfish, crustaceans) harvested from **Long Island Sound**?

Yes No Don't know

If your answer was "yes," please continue. If your answer was "no" or "don't know," please return this completed survey form in the envelope provided.

3. For calendar year 1996, what *percentage* of the total seafood you purchased, sold, and/or served in Connecticut came from Long Island Sound?

_____ (Ex: none, less than 10%, one-third, 100%, etc.)

(Continued on back)

4. Please list the species harvested from Long Island Sound that you *regularly or seasonally* purchase, sell, and/or serve in **Connecticut** in the left-hand column below. In the second column, please indicate for each species, the percentage of the total amount you purchased, sold and/or served in Connecticut that you know was harvested in Long Island Sound. (Use 1996 as a reference point.) In the third column, please indicate the number of pounds or bushels that percentage represents, if possible. See example below.

<u>Species:</u>	<u>Percent:</u> (100%, < 5%, 25%, ...)	<u>Amount:</u> (Pounds, bushels, ...)
Ex. Hard clams	25%	20 bushels
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Thank you for your help! Please return this completed form in the pre-paid envelope provided.

Appendix 15. Portion size conversions to cooked edible weight basis

Measures, Conversions & Weights – A, B and No Sides

1 oz = 28.36 g

"B" shape values: Ozmeal = "B" value x thickness

B1 = .2 B3 = .6 B5 = 1.5
 B2 = .5 B4 = 1.0

"A" shape values:

A1=.6 T A6 = 1 1/8 C A11 = ¼ C A16 = ¼ C
 A2 = .6 T A7 = 3 T A12 = 1/3 C A17 = ½ C
 A3 = 1.8 T A8 = 1 3/8 C A13 = 1 ½ C A18 = .44 C
 A4 = 3/8 C A9 = 1 ½ C A14 = 1.24 C A19 = .68 C
 A5 = 7T A10 = ¾ C A15 = 2 C

All "A" side and "B" side amounts represent cooked values, except for shellfish eaten raw
 USDA refers to USDA, 1987; MDB refers to Arneson, 1988)

FISH	A SHAPES Oz meal = "A" value x number x amount	B SHAPES Oz meal = "B" value x number x amount	NO SIDE Oz meal = value x number x amount
ANCHOVIES 191			(USDA) 5 anchovies = 20 g; 1 anchovy = 4 g = .1411 oz/anchovy "EACH" = number x amount x .1411
BLUEFISH, SNAPPERS 185			If ozwgt = missing, ozmeal = number x amount x 1.4 oz (1.4 oz = average of responses for snapper blues)
CAVIAR 002	A1=.339 oz (MDB) A3 = 1.016 A12 = 3.009		
CLAMS, WHOLE RAW 20101	A8 = 6 x .3175 A11 = 4 x .3175 A13 = 6 x .3175 A15 = 8 x .3175		(USDA) 20 small clams – 180 g; 1 clam = 9 g; = .3175 oz each (Water content of 20 small clams = 147 g) Assume 15 clams/pound If oz weight = missing, then oz meal = .3175 x number x amount If ozwgt >missing, then ozmeal = ozwgt x 15/16 x number x amount x .3175

<p>CLAMS, WHOLE COOKED 201</p>	<p>Oz meal = ("A" value x number x amount) A1 = .1587 A11 = 9 x .1587 A3 = .1 A12 = 1.587 A4 = 1.89 A13 = 12 x .1587 A6 = 5.952 A14 = 6.567 A8 = 7.275 A15 = 18 x .1587</p>	<p>If shape=B5 and thickness = 30, ozmeal = 10 oz; otherwise use B shape values x number x amount</p>	<p>(USDA) 20 small clams = 90 g; 1 clam = 4.5 G = .1587 oz each 57.27 g water/20 clams Assume 15 clams/pound and 50% water loss after cooking (Computation)</p>
	<p>A9 = 7.937 A16 = .1587 A10 = 3.968 A17 = 2.646 A18 = 2.302 (MDB)</p>		<p>f ozwgt = missing, then ozmeal = number x amount x .1587 f ozwgt>missing, ozmeal = oz wgt x 15/16 x number x amount x .1587</p>
<p>CLAMS, WHOLE RAW & COOKED, UNSPECIFIED 20105</p>	<p>A6 = .9338 oz A13 = 9 x .2381 A8 = 1.14 A14 = 6.567 A9 = 1.25 A15 = 12 x .2381 A10 = .62 A16 = .2381 x A11 = 6 x .2381 number x amt A12 = .2381 x A17 = 2.646 x number x number x amt amount A18 = 2.302 x number x amt</p>	<p>If B1 or B2 and # > 1, then ozmeal = number x .1587 x amount If shape = B3, then assume is quohog; ozmeal = .3527 x number x amount If shape = B4 and thickness ≥ 10, then ozmeal = 6oz portion (raw) x number x amount x .575 (water loss) If shape = B5 and thickness ≥ 10, then ozmeal = 8 oz portion raw x number x amount x .575 (water loss)</p>	<p>"Each" = .3175 oz each (raw) + .1587 oz each (cooked) / 2 = .2381 oz each (raw/cooked unspecified) Assume 15 clams in one pound If ozwgt =missing, then ozmeal = number x amount x .2381 If ozwgt > missing, then ozmeal = ozwgt x 15/16 x .2381 x number x amount</p>
<p>CLAMS, WHOLE QUOHOGS COOKED 20107</p>	<p>Asians: A1 = .1587 A13 = 12 x .1587 A3 = .1 A14 = 6.567 A4 = 1.89 A15 = 18 X .1587 A6 = 5.952 A16 = .1587 A8 = 7.275 A17 = 2.646 A9 = 7.937 A18 = 2.302 A10= 3.968 A11 = 9 x .1587 A12 = .1587</p>		<p>(FP) 1 Quohog = 20 g; 10 g after cooking (50% water loss) = .3527 oz each, cooked If ozwgt = missing, then ozmeal = .3527 x number x amount</p>
<p>CLAM CHOWDER COOKED 20102</p>	<p>A4 = .31 oz A11 = .62 A6 = .9338 A12 = .2739 A8 = 1.14 A13 = 1.25 A9 = 1.25 oz A15 = 1.66 oz A10 = .62 oz A16 = .62 oz A17 = .417 oz</p>		<p>(NCB / recipes): 1 c chopped clams = 10 c. chowder. 1 c. clams = 8.3 oz, therefore .83 oz clams / 8 oz chowder = .104 oz clams per oz chowder If ozwgt > missing, then ozmeal = .104 x ozwgt x amount x number</p>
<p>CLAM SAUCE COOKED 20103</p>	<p>A4 = 1.04 oz A10 = 2.07 A11 = 2.07 A14 = 3.42 A15 = 5.53</p>		<p>(NCB / recipes): 1 c. minced clams = 8.3 oz. 1 c. clams = 3 c. sauce = 6-1/2 c. servings. 8.3 oz/3 = 2.8 oz clams / 8 oz sauce = 1.4 oz clams / ½ c. serving = .35 oz clams per ounce sauce If ozwgt > missing, then ozmeal = .35 x ozwgt x number x amount</p>

CLAM CHOWDER/ SAUCE UNSPECIFIED COOKED 20109	A4 = .7 oz A6 = 2.0 A7 = .3 A8 = 2.5 A9 = 2.7 A10 = 1.4 A11 = 1.4 A12 = .62 A13 = 2.7 A15 = 3.6 A16 = 1.4		Average of chowder and sauce values: .83 oz clams/8 oz chowder + 2.8 oz clams/8 oz sauce / 2 = 1.8 oz clams / 8 oz = .225 oz clams / ounce of chowder/sauce If ozwgt > missing, then ozmeal = ozwgt x 1.8 / 8 x number x amount
CLAMS, STUFFED COOKED 017			NCB / recipes): 24 clams = 24 stuffed clams, assume 1 clam / stuffed clam "Each" = number x amount x .1587 oz per cooked clam
CLAM STRIPS COOKED 20104 (Assumed breaded & fried)	A2 = .08 oz A4 = 1.5 A6 = 4.5 A8 = 5.5 A9 = 6 A10 = 3 A11 = 3 A12 = 1.3 A13 = 6 A15 = 8 A16 = 3 A17 = 2 A18 = 1.8 Ozmeal = A shape value x .842 (breeding factor)	If B4 and thickness \geq 10, then assume = 6 oz raw clam strips ; ozmeal = 6 oz x .842 (breeding factor) x .575 (water loss) x number x amount If B5 and thickness \geq 10, then assume 8 oz raw portion; ozmeal = 8 oz x .842 (breeding factor) x .575 (water loss) x number x amount All B shape values: ozmeal = ozmeal x .575 (water loss in cooking) x .842 (breeding factor)	NCB measurements: 12 raw clam strips/oz = .08 oz/strip raw. 8 oz raw clam strips cooks to 3.4 oz cooked = 57.5% water loss 1 oz raw = .425 oz cooked. Breeding factor: 84.2% clams, rest is other ingredients If ozwgt > missing, then ozmeal = ozwgt x .425 x number x amount x .842 "Each" = .08 oz/strip x number x amount x .842 x .575
CRAB, ALASKAN KING (LEGS) COOKED 216	A9 = 4.73 oz each A13 = 4.73 oz each A15 = 2 x 4.73 oz each		(USDA) 1-1 lb. Leg yields 172 g meat = 6.0670 oz/leg raw meat (USDA) 1-1 pound leg cooked = 134 g = 4.7266 oz cooked meat/ 1-lb. leg If ozwgt = missing, then ozmeal = 4.73 oz/leg cooked x number x amount If ozwgt > missing, then ozmeal = 4.73oz cooked meat per leg/16 x oz wgt x number x amount
CRAB, BLUE, ROCK, SNOW & STONE COOKED 202, 203, 217, 220, 246	A1 = .179 oz A2 = .179 A3 = .536 A6 = 5.357 A7 = .893 A8 = 6.548 A9 = 7.143 A11 = 3.571 A12 = 1.587 A13 = 7.143 A14 = 5.911 A15 = 2 x .7466 A16 = 3.571 A17 = 2.381 A19 = 3.239	If B3, B4 or B5 and number > 1, ozmeal = number x .7466 oz x amount Rest = B shape values x number x amount	(USDA) 1 whole crab (1/3 lb) = .7407 oz or 21 g meat (Computation) Refuse of .33 lb crab = 86% = 16 oz / 3 = 5.33 oz x .14 = .7466 oz meat after cooking .7466 x 3 = oz crabmeat in 1 lb.crab = 2.23 oz Assume 1 crab = 1/3 pound Assume oz wgt is for whole crabs If ozwgt = missing; ozmeal = .7466 x number x amount If ozwgt \leq 8 oz, then assumed is picked meat; ozmeal = ozweight x number x amount If ozwgt > 8, then oz meal = 2.23 / 16 x ozwgt x number x amount

CRAB, CAKES COOKED 20201		If shape = B, then ozmeal = number x amount x 2.1164 oz/cake (Assuming B shape = each)	(USDA) 1 cake = 60 g = 2.1164 oz/cake If ozwgt = missing, ozmeal = 2.11 x number x amount
CRAB, CANNED COOKED 219	A2 = .325 A6 = 5.3570 OZ		
CRAB, DUNGENESS 218			(USDA) 1 ½ lb whole crab yields 163 g or 5.75 oz meat/crab Assume 76% refuse Oz meal = .24 x ozwgt x number x amount
CRAB, IMITATION COOKED 215	A1 = .180 OZ A11 = 3.598 A2 = .180 A12 = 1.599 A3 = .540 A13 = 7.196 A4 = 1.80 A15 = 9.595 A6 = 5.39 A16 = 3.598 A9 = 7.196 A17 = 2.399 A10 = 3.598 A18 = 3.263		
CRAB SALAD COOKED 20202/20203	A6 = 5.357 oz A15 = 9.524 A9 = 7.143 A16 = 3.571 A11 = 3.571 A17 = 2.381 A12 = 1.587 A13 = 7.143 A14 = 5.911	MDB – straight calculation	Assume all is crab salad
COMBINATION PLATTER 004			Assume 8 oz serving
CRAWFISH 204		Assume all B shapes = "each" Ozmeal = .111 x number x amount	(USDA) 8 crawfish = 27 g raw based on 15-25/lb 6.7% water loss during cooking 27/8 = g one crawfish/28.35 = .119 oz/raw crawfish x .933 (water loss) = .111 oz / crawfish cooked If ozwgt = missing, ozmeal = .111 x number x amount If ozwgt > missing, ozmeal = ozwgt x number x amount
EEL 124			1 filet = 159 g = 5.6085 oz
FILETS AND STICKS, FISH, FROZEN 006, 016		Ozmeal = B value x thickness x number x amount x .581 (breeding factor)	(USDA) 1 stick (4" long x 1" wide x ½" high) = 28 g = .987oz/stick 58.1% is fish, remainder is breeding and batter. If ozwgt = missing, ozmeal = .987 x number x amount If ozwgt > missing, ozmeal=ozwgt x number x amount x .581
FISH CAKES 023		Ozmeal = B value x thickness x number x amount x .50 (breeding factor)	(NCB/recipes): 1 lb fish filets = 1 doz cakes = 1.33 oz If ozwgt = missing, then ozmeal = 1.33 x number x amount

FISH CHOWDER 233, 234, 235, 025	A15 = 3.0 oz Ozmeal = 1.5/8 x 16 x number x amount		(NCB/recipes): 2 lbs filets in 6 servings, assume serving = 12 oz. 72/32 = 2.25 oz chowder/oz fish = .44 oz fish/oz chowder If ozwgt > missing, then ozmeal = ozwgt x .44 x number x amount
LOBSTER ROLL COOKED 20501	A1 = .198 A10 = 3.836 A2 = .198 A11 = 3.836 A3 = .575 A12 = 1.705 A4 = 1.918 A13 = 7.672 A6 = 5.754 A15 = 10.229 A7 = .959 A16 = 3.836 A8 = 7.033 A17 = 2.557 A9 = 7.672 A19 = 3.479 Ozmeal = A value x number x amount	Ozmeal = B value x thickness x number x amount	If ozwgt > missing, then ozmeal = number x amount x ozwgt If ogwgt = missing, then ozmeal = 5.4 oz 5.4 oz = average of portion sizes via Fish Market Survey
LOBSTER SALAD COOKED 20502	A1 = .198 A10 = 3.836 A2 = .198 A11 = 3.836 A3 = .575 A12 = 1.705 A4 = 1.918 A13 = 7.672 A6 = 5.754 A15 = 10.229 A7 = .959 A16 = 3.836 A8 = 7.033 A17 = 2.557 A9 = 7.672 A19 = 3.479 Ozmeal = A value x number x amount	Ozmeal = B value x thickness x number x amount	Ozmeal = ozwgt
LOBSTER TAIL COOKED 20503	A13 = 6.12 oz		Fish Market Survey: average portion size = 6 oz If ozwgt = missing, then ozmeal = 6 x number x amount If ozwgt > missing, then ozmeal = ozwgt x number x amount
LOBSTER TAIL/SALAD/ ROLL UNSPECIFIED, COOKED 20504	A1 = .198 A10 = 3.836 A2 = .198 A11 = 3.836 A3 = .575 A12 = 1.705 A4 = 1.918 A13 = 7.672 A6 = 5.754 A15 = 10.229 A7 = .959 A16 = 3.836 A8 = 7.033 A17 = 2.557 A9 = 7.672 A19 = 3.479 Ozmeal = A value x number x amount		If ozwgt = missing, then ozmeal = 6 x number x amount

LOBSTER, WHOLE, COOKED 205	A1 = .198 A10 = 3.836 A2 = .198 A11 = 3.836 A3 = .575 A12 = 1.705 A4 = 1.918 A13 = 7.672 A6 = 5.754 A15 = 10.229 A7 = .959 A16 = 3.836 A8 = 7.033 A17 = 2.557 A9 = 7.672 A19 = 3.479	Ozmeal = B value x thickness x number x amount	(USDA) 1 11/2 lb whole lobster = 5.28 oz meat in 24 oz lobster or 150 g (Computation) Refuse from 11/2 lb lobster = 78% 1 oz lobster = .2204167 oz meat If number = missing, then number = 1 and
	Ozmeal = A value x number x amount		ozwgt = 20 If ozwgt > missing, then ozmeal = .2204 x number x amount x ozwgt
MUSSELS, BLUE, COOKED 206	Ozmeal = A value x number x amount A1 = .1538 A4 = 3 x .1538 A12 = .1538 A6 = 6 x .1538 A13 = 8 x .1538 A8 = 8 x .1538 A15 = 24 x .1538 A9 = 8 x .1538 A16 = 2 x .1538 A10 = 12 x .1538 A17 = .1538 Asians: A3 = .1538 A11 = .1538 x 12 A12 = .1538 A15 = .1538 x 24	Assume all mussels in shell B1 = 1 mussel B2 = 2 B3 = 3 B4 = 4 B5 = 5 mussels Ozmeal = B value x number x amount x .1538	(CC/NCB measurements): .1538 oz/mussel 28 mussels in one pound = 4.306 oz meat/lb mussels If ozwgt = missing, ozmeal = .1538 x number x amount If ozwgt > missing, ozmeal = .1538 x 28/16 x number x amount x ozwgt
OCTOPUS COOKED 207 Assuming battered and fried	Ozmeal = A value x number x amount x .946 (breeding factor) A11 = 6.493 A12 = 2.886 A13 = 12.986 A15 = 17.315 A16 = 6.493 A17 = 4.319	Ozmeal = B value x thickness x number x amount x .946 (breeding factor)	If ozwgt > missing, ozmeal = ozwgt x number x amount x .946 (breeding factor)
OYSTERS COOKED (MOIST HEAT) 20802, 20805		Assume B shapes are "each" Ozmeal = 3 x .2469 x number x amount	(USDA) 6 medium = 42 g; 1 oyster = 7 g = .2469 oz/oyster 29.52 g water/6 oysters assume 10 oysters in shell/lb (CC, Cove Market) If ozwgt = missing, ozmeal = .2469 x number x amount If ozwgt > missing, ozmeal = .2469 x number x amount x ozwgt x 10/16
OYSTERS RAW 20801		Assume all B shape oysters are "each" Ozmeal = 3 x .4938 x number x amount	(USDA) 6 medium = 84 g; 1 oyster = 14 g = .4938 oz/oyster 71.52 g water/6 oysters; (Computation) 50% water loss during cooking Assume 10 oysters/pound If ozwgt = missing, ozmeal = .4938 x number x amount If ozwgt > missing, ozmeal = .4938 x 10/16 x number x amount

OYSTER STEW COOKED 20803	A9 = 1.6 oz A10 = .8 A11 = .8 A12 = .33 A13 = 1.6 A15 = 2.13 Oz meal = A value x number x amount		(NCB) 1 pint oysters = 9.6 oz = 6 servings = 1.6 oz oysters/12 oz serving 72/9.6 = 7.5 oz stew/oz oysters = .133 oz oysters/oz stew If ozwgt > missing, ozmeal = .133 x ozwgt x number x amount
OYSTERS RAW & COOKED, UNSPECIFIED 208	Ozmeal = A value x number x amount (Assuming raw) A3 = .3704 A4 = .3704 A7 = 1.138 A9 = 9.101 A10 = 4.550 A11 = 4 X .3704 A12 = .3704 A13 & Number =1; 9.101 A13 & Number >1; 6 x .3704 A15 = 6 X .3704 A16 = .3704 A17 = 3.034 Asians: A13 = .2469 A16 = .2469	Assume all B values = "each" Ozmeal = .3704 x number x amount	.4938 oz/oyster raw + .2469 oz/oyster cooked / 2 = .3704 oz/oyster raw/cooked If ozwgt = missing, ozmeal = .3704 x number x amount If ozwgt > missing, ozmeal = ozwgt x 10/16 x .3704 x number x amount
SARDINES 010 COOKED	A1 = .243 A11 = 4.868 A12 = 2.163 A13 = 9.786 Ozmeal = A shape value x number x amount		(usda) 2 sardines = 24 g = 12g/sardine = .4233 oz/sardine 1 can = 3.25 oz If ozwgt = missing, ozmeal = 3.25 x number x amount If ozwgt > missing, ozmeal = ozwgt x number x amount
SCALLOPS, BAY COOKED 21002	Ozmeal = A shape value x number x amount A4 = 2.381 oz A12 = .3827 A6 = .143 oz A13 = 9.524 A7 = 1.19 A14 = 6.130 A8 = 8.730 A15 = 12.699 A9 = 9.524 A16 = 4.762 A10 = 4.762 A17 = 3.175 A11 = 4.762 A18 = 2.762		(USDA) 5 bay scallops = 31 g; 1 bay scallop = 6.2 g = .2187 oz/bay scallop Assume 23.1 % cooking loss If ozwgt = missing, ozmeal = .2187 x number x amount If ozwgt > missing, ozmeal = ozwgt x number x amount x .769 (water loss)
SCALLOPS, SEA COOKED 21001	Ozmeal = A shape value x number x amount A4 = 2.381 oz A12 = .3827 A6 = .143 oz A13 = 9.524 A7 = 1.19 A14 = 6.130 A8 = 8.730 A15 = 12.699 A9 = 9.524 A16 = 4.762 A10 = 4.762 A17 = 3.175 A11 = 4.762 A18 = 2.762		(USDA) 2 sea scallops = 31 g; 1 sea scallop = 15.5 g = .5467 oz/sea scallop Cooking loss 23.1 % If ozwgt = missing, ozmeal = .5467 x number x amount If ozwgt > missing, ozmeal = number x amount x ozwgt x .769 (water loss)

<p>SCALLOPS, UNPSECIFIED COOKED 210</p>	<p>Ozmeal = A shape value x number x amount A4 = 2.381 oz A12 = .3827 A6 = .143 oz A13 = 9.524 A7 = 1.19 A14 = 6.130 A8 = 8.730 A15 = 12.699 A9 = 9.524 A16 = 4.762 A10 = 4.762 A17 = 3.175 A11 = 4.762 A18 = 2.762</p>	<p>If shape = B1 ozmeal = .3827 x number x amount All others, ozmeal = B shape value x thickness x number x amount</p>	<p>1 unspecified scallop = .3827 (mean of bay and sea scallops) water loss during cooking = 23.1 % If ozwgt = missing, ozmeal = .3827 x number x amount If ozwgt > missing, ozmeal = ozwgt x number x amount x .769 (water loss)</p>
<p>Asians: A11 = 6.493 x number x amount A12 = .5536 x number x amount A17 = 4.329 x number x amount</p>			
<p>SCUNGILLI / WHELK COOKED 211</p>	<p>A12 = 1.881 OZ A15 = 11.289 A17 = 2.822 Ozmeal = A value x number x amount</p>		<p>Cooked weight is 48.5 % of raw weight (USDA) If ozwgt > missing, ozmeal = ozwgt x number x amount x .485</p>
<p>SEAFOOD SALAD (SURIMI) COOKED 011 (20202)</p>	<p>A1 = .180 A11 = 3.598 A12 = 1.599 A13 = 7.196 A16 = 3.598 A17 = 2.399 Ozmeal = A shape x number x amount</p>		
<p>SHRIMP, JUMBO COOKED – MOIST HEAT 21205</p>			<p>Jumbo shrimp 6-8 count/lb, (used 8 cnt.lb): = 2 oz /raw shrimp (Computation) 21% cooking loss Jumbo shrimp = 2 oz x .79 = 1.58 oz each cooked (Warfel) If ozwgt = missing, ozmeal = 1.58 x number x amount If ozwgt > missing, ozmeal = ozwgt x .79 x number x amount</p>
<p>SHRIMP, LARGE, COOKED – MOIST HEAT 21204</p>			<p>Large shrimp = 10-25 count/lb (used 15 cnt/lb) = 1.07 oz/raw shrimp 21% cooking loss Large shrimp = 1.07 x .79 = .8453 oz/ cooked shrimp If ozwgt = missing, ozmeal = .8453 x number x amount If ozwgt > missing, ozmeal = ozwgt x number x amount x .79</p>

SHRIMP, MEDIUM COOKED – MOIST HEAT 21203	A1 = .3950 A11 = 3.836 A2 = .3950 A12 = .3950 A3 = .974 A13 = 7.672 A4 = 1.918 A14 = 6.348 A5 = 2.238 A15 = 10.22 A6 = 5.754 A16 = 3.836 A7 = .959 A17 = 2.557 A8 = 6.79 A19 = 3.479 A9 = 7.672 A10 = 3.836 Ozmeal = a value x number x amount		Medium shrimp 26-42 count/lb (used 32 cnt/lb) = .50 oz/raw shrimp Cooking loss 21% Med shrimp = .5 x .79 = .3950 oz/cooked shrimp If ozwgt = missing, ozmeal = .3950 x number x amount If ozwgt > missing, ozmeal = ozwgt x number x amount x .79
SHRIMP, SMALL COOKED – MOIST HEAT 21202			Small Shrimp = 51-60 count/lb (used 55 cnt/lb) = .29 oz/shrimp raw 21% cooking loss Small shrimp = .29 x .79 = .2291 oz/shrimp cooked If ozwgt = missing, ozmeal = .2291 x number x amount If ozwgt > missing, ozmeal = ozwgt x number x amount x .79
SHRIMP, POPCORN COOKED – MOIST HEAT 21201			Popcorn shrimp = 100 count/lb = .16 oz/shrimp raw 21% cooking loss Popcorn shrimp = .16 x .79 = .1264 oz/shrimp cooked If ozwgt = missing, ozmeal = .1263 x number x amount If ozwgt > missing, ozmeal = ozwgt x number x amount x .79
SHRIMP, UNSPECIFIED COOKED MOIST HEAT 212 (ASSUMING MEDIUM SHRIMP) SHRIMP, DRIED 196	A1 = .3950 A11 = 3.836 A2 = .3950 A12 = .3950 A3 = .974 A13 = 7.672 A4 = 1.918 A14 = 6.348 A5 = 2.238 A15 = 10.22 A6 = 5.754 A16 = 3.836 A7 = .959 A17 = 2.557 A8 = 6.79 A19 = 3.479 A9 = 7.672 A10 = 3.836 Ozmeal = a value x number x amount		For unspecified shrimp , assume = medium shrimp "Each" = .3950 oz Calculate as for medium shrimp
SHRIMP JUMBO/LARGE STUFFED 028			If number ≤ 3, use Jumbo shrimp calculations If number > 3, use Large shrimp calculations
SMELT 161			NCB/recipes): 10-12 smelt in one pound

SNAILS, PERIWINKLES 194 COOKED	A11 = 3.24 oz A16 = 6.493 A12 = 2.886 A17 = 4.319 A13 = 12.986 A15 = 5.36 Ozmeal = A shape x number x amount		(CC/NCB measurements): 55 snails uncooked = 200 gm = 58 gm cooked = 1.0545 gm/snail = .0372 oz meat /snail 8 oz snails = 3.24 x 8/6 = 4.309 oz
SQUID COOKED 213 Assuming battered and fried	Ozmeal = A shape value x .946 x number x amount A4 = 1.852 A13 = 7.408 A6 = 5.556 A14 = 6.13 A8 = 6.79 A15 = 9.877 A9 = 7.408 A16 = 3.704 A10 = 3.704 A17 = 2.469 A11 = 3.704 A19 = 3.263 A12 = 1.646	Ozmeal = B shape value x thickness x .946 (breading factor) x number x amount	(USDA) 17.8 % water loss in cooking 94.6 % squid, rest batter If ozwgt > missing, ozmeal = ozwgt x number x amount x .822 (water loss) x .946 (breading factor)
TUNA, CANNED 174	Ozmeal = A shape value x number x amount A1 = .224 A11 = 6.17 A2 = .224 A12 = 2.856 A3 = 1.0 A13 = 12.3 A4 = 2.9 A14 = 10 A5 = .437 A15 = 16.4 A6 = 9 A16 = 6.1 A7 = 1.7 A17 = 4.1 A8 = 11 A18 = 3.58 A9 = 12.3 A19 = 5.08 A10 = 6.17		If ozmeal = missing, ozmeal = 3 oz
URCHIN, SEA ROE 226	A2 = .779 x number x amount	If shape = B1 and thickness = 3, ozmeal = .6 oz x number x amount	

I. Cooking Conversions – Fish Species

(Source: USDA, 1987)

if portion size provided in oz weight measurement, then the following conversions were made to account for weight loss due to cooking (dry heat):

Cooked ozweight = .78 x ozweight for smallmouth bass (102), largemouth bass (101), striped bass (103), unspecified bass (104), bluefish (105), tautog (106), bonito (108), bullhead (111), mahi-mahi (121), grouper (128), hake (131), monkfish (138), orange roughy (140), pollock (147), porgy (148), shad (158), sunfish (165), tilapia (168), turbot (176), whitefish (177), snapper blues (185), and butterfish (200).

Cooked ozweight = .788 x ozweight for freshwater catfish (113) and unspecified catfish (116).

Cooked ozweight = .728 x ozweight for cod (118), whiting (180) and scrod (157).

Cooked ozweight = .709 x ozweight for white perch (143), yellow perch (144), unspecified perch (145), and swordfish (166).

Cooked ozweight = .677 x ozweight for eel (124).

Cooked ozweight = .721 x ozweight for flounder (127) and sole (163).

Cooked ozweight = .722 x ozweight for haddock (129) and redfish (142).

Cooked ozweight = .717 x ozweight for halibut (130).

Cooked ozweight = .659 x ozweight for mackerel (135).

Cooked ozweight = .705 x ozweight for salmon (150).

Cooked ozweight = .817 x ozweight for shark (159).

Cooked ozweight = .924 x ozweight for smelt (161).

II. Conversions for suspected whole fish

(Conversion rate of 40% edible meat from whole fish from Roderick MacLeod, CT DEP Marine Fisheries, 14 July, 1998; average weights of freshwater fish species provided by Tim Barry, CT DEP Inland Fisheries, 21 July 1998)

Smallmouth and largemouth bass, 1-2 pounds; white & yellow perch, < 1 pound; bullheads, 1 pound; channel catfish, 2 pounds; bluegills, .25 - .5 pounds; pumpkinseeds, .25 pounds; walleye, 2-3 pounds, carp, 4-8 pounds; and trout, .5 pounds

Seasons: Need to indicate what we used as "seasons" for each species caught

Bluefish, May - October, peak July - September
Striped Bass, year round, peak May - October/November
Flounder - peak spring and fall, year round
Fluke - late spring to fall, peak late June to early September
Scup - summer and early fall, peak August - September
Tautog - April - early December, peak May-June and October-November

Ozmeal multiplied by .40 in following cases to account for loss due to cleaning of fish:

(For all populations except Southeast Asians)

If code = 101 or 102, and ozweight \geq 16 OR shape = B5 and thick \geq 10

If code = 103 or 104, and ozweight \geq 24 OR shape = B4 or B5, and thick \geq 10

If code = 105 and ozweight \geq 16 OR shape=B3, B4 or B5 and thick \geq 10

If code = 106 and ozweight \geq 16 OR shape = B3, B4 or B5 and thick \geq 20

If code = 11 and ozweight \geq 16

If code = 112 and ozweight \geq 24

If code = 113 or 116, and ozweight \geq 16

If code = 127 and ozweight \geq 16 OR shape = B3, B4 or B5 and thick \geq 10

If code = 143, 144 or 145 and ozweight \geq 16

If code=148 and ozweight \geq 12 OR shape = B3, B4 or B5 and thick \geq 10

If code = 165 and ozweight \geq 8

If code = 171 and ozweight \geq 12 OR shape = B3, B4 or B5 and thick \geq 10

If code = 188 and ozweight $>$ 24

Appendix 16. Breakdown of mean meal size per time and mean number of meals per year, by population, for selected saltwater species.

A. Bluefish

Population	Type of Meal	Mean meal size (oz) per time					Mean no. of meals per year				
		N	Mean	Std Dev	Min	Max	N	Mean	Std Dev	Min	Max
General Population	Bought	50	5.3	3.6	0.8	18.9	50	3.1	3.8	1.0	23.4
	Caught	20	5.2	2.3	1.4	8.7	21	2.3	2.1	1.0	10.0
Sport Fishing Population	Bought	23	5.5	3.8	2.3	18.7	23	2.9	2.4	1.0	8.8
	Caught	35	7.5	5.3	1.2	25.0	34	10.3	17.5	1.0	104.0
Commercial Fishing Population	Bought	---	---	---	---	---	---	---	---	---	---
	Caught	66	6.4	3.9	1.1	22.7	70	6.0	7.4	1.0	42.0
Limited Income Population	Bought	31	4.6	2.9	0.7	14.2	31	20.3	30.4	1.0	104.0
	Caught	66	7.4	6.7	0.9	28.3	67	10.6	13.1	1.0	52.0
Minority Population	Bought	57	4.1	2.9	0.2	14.2	57	28.6	26.0	1.0	104.0
	Caught	58	8.5	7.0	0.9	35.4	58	13.7	16.1	1.0	52.0
Southeast Asian Population	Bought	13	3.7	2.7	0.4	7.1	13	44.7	23.6	23.4	78.0
	Caught	29	5.9	2.9	2.5	14.0	29	17.2	18.3	3.0	52.0
Non-SE Asian Minority Pop.	Bought	44	4.2	3.0	0.2	14.2	44	23.8	25.0	1.0	104.0
	Caught	29	11.2	8.8	0.9	35.4	29	10.3	13.0	1.0	52.0
Women >15 & ≤45	Bought	27	4.6	2.2	1.7	11.3	27	22.7	29.2	1.0	104.0
	Caught	38	6.0	5.1	0.9	28.3	38	9.2	14.1	1.0	52.0
Children ≤15	Bought	23	2.2	2.1	0.2	9.4	23	22.8	22.4	1.0	104.0
	Caught	20	4.1	3.4	0.6	11.8	20	6.5	12.1	1.0	52.0

B. Striped Bass

Population	Type of Meal	N	Mean meal size (oz) per time				Mean no. of meals per year				
			Std Dev	Min	Max	N	Std Dev	Min	Max		
General Population	Bought	19	4.2	1.7	1.1	8.5	19	3.2	5.1	1.0	23.4
	Caught	20	5.6	2.8	1.4	11.3	21	3.6	3.1	1.0	10.0
Sport Fishing Population	Bought	13	5.5	2.6	3.1	8.5	14	6.2	5.0	0.9	11.7
	Caught	129	9.6	10.8	0.6	85.0	131	9.2	16.3	1.0	140.0
Commercial Fishing Population	Bought	---	---	---	---	---	2	11.7	---	11.7	11.7
	Caught	75	7.3	6.5	1.1	34.0	77	6.0	8.4	0.9	51.0
Limited Income Population	Bought	18	5.4	2.7	0.9	8.5	18	7.8	4.0	1.5	11.7
	Caught	38	8.9	6.3	1.1	34.0	39	12.4	23.9	1.0	140.0
Minority Population	Bought	10	3.9	2.0	0.9	8.5	10	5.7	4.0	1.0	10.0
	Caught	32	7.6	5.9	1.1	34.0	32	9.6	11.2	1.0	36.0
Southeast Asian Population	Bought	2	3.7	---	3.7	3.7	2	10.0	---	10.0	10.0
	Caught	9	7.5	3.1	1.9	10.6	9	17.1	17.9	2.0	36.0
Non-SE Asian Minority Pop.	Bought	8	3.9	2.2	0.9	8.5	8	4.6	3.7	1.0	8.8
	Caught	23	7.7	6.7	1.1	34.0	23	6.7	5.4	1.0	23.4
Women >15 & ≤45	Bought	9	3.4	0.7	2.4	4.7	10	5.2	3.6	1.0	10.0
	Caught	38	5.3	3.5	1.4	17.0	39	5.4	8.5	0.9	36.0
Children ≤15	Bought	9	3.9	2.8	0.9	8.5	9	5.4	4.7	1.0	11.7
	Caught	22	4.1	3.9	0.4	17.0	22	10.8	13.5	1.0	36.0

C. Blackfish

Population	Type of Meal	N	Mean meal size (oz) per time				Mean no. of meals per year				
			Std Dev	Min	Max	N	Std Dev	Min	Max		
General Population	Bought	5	3.5	2.1	1.4	6.8	6	1.7	0.8	1.0	3.0
	Caught	13	7.4	2.8	2.3	11.9	13	4.4	2.7	1.0	12.0
Sport Fishing Population	Bought	8	3.7	0.9	3.1	5.7	8	14.4	23.2	1.0	52.0
	Caught	101	8.0	6.1	0.8	51.0	104	8.8	16.2	1.0	140.0
Commercial Fishing Population	Bought	3	7.8	5.1	2.4	12.5	3	7.3	4.6	2.0	10.0
	Caught	81	5.3	3.2	1.7	17.0	84	9.0	13.8	1.0	70.3
Limited Income Population	Bought	40	9.1	7.8	2.3	51.0	41	11.0	22.0	1.0	140.0
	Caught	9	2.4	1.5	0.4	4.0	10	20.7	22.1	1.0	52.0
Minority Population	Bought	9	2.4	1.5	0.4	4.0	10	20.7	22.1	1.0	52.0
	Caught	31	7.9	3.8	2.3	18.8	31	15.8	16.7	1.0	70.3
Southeast Asian Population	Bought	---	---	---	---	---	---	---	---	---	---
	Caught	13	8.3	2.6	2.8	11.2	13	10.8	7.9	4.0	23.4
Non-SE Asian Minority Pop.	Bought	9	2.4	1.5	0.4	4.0	10	20.7	22.1	1.0	52.0
	Caught	18	7.7	4.5	2.3	18.9	18	19.4	20.4	1.0	70.3
Women >15 & ≤45	Bought	6	3.5	1.3	2.3	5.7	7	10.3	18.8	1.0	52.0
	Caught	25	5.7	3.9	1.9	18.8	25	11.4	14.8	1.0	70.3
Children ≤15	Bought	7	1.9	1.3	0.4	3.4	7	11.6	18.4	1.0	52.0
	Caught	11	4.8	3.4	0.4	8.6	13	8.4	7.0	1.0	26.0

D. Porgy

Population	Type of Meal	N	Mean meal size (oz) per time				N	Mean no. of meals per year			
			Std Dev	Min	Max	Std Dev		Min	Max		
General Population	Bought	9	3.5	3.9	0.7	12.5	9	12.8	34.2	0.9	104.0
	Caught	5	6.2	3.4	0.7	9.2	5	4.9	3.9	1.0	11.5
Sport Fishing Population	Bought	18	5.2	2.8	1.8	9.9	18	10.6	13.8	1.0	52.0
	Caught	55	5.4	3.9	0.6	20.0	56	6.9	8.5	1.0	48.0
Commercial Fishing Population	Bought	1	8.8	---	8.8	8.8	1	35.1	---	35.1	35.1
	Caught	23	3.8	1.7	0.7	6.6	23	6.3	11.3	1.0	46.8
Limited Income Population	Bought	89	5.0	5.9	0.7	29.5	89	23.7	30.9	1.0	260.0
	Caught	27	5.8	3.9	0.7	19.9	28	10.1	11.5	1.0	48.0
Minority Population	Bought	155	4.3	4.8	0.6	29.5	155	22.9	27.3	0.9	260.0
	Caught	35	4.8	1.8	1.7	11.1	35	9.1	8.4	1.0	26.0
Southeast Asian Minority Pop.	Bought	70	3.6	3.0	0.6	20.7	70	18.0	13.7	3.0	52.0
	Caught	8	5.0	0.9	3.5	5.5	8	6.5	2.9	1.8	8.0
Non-SE Asian Population	Bought	85	4.8	5.9	0.7	29.5	85	26.9	34.3	0.9	260.0
	Caught	27	4.7	2.0	1.7	11.1	27	9.9	9.4	1.0	26.0
Women >15 & ≤45	Bought	50	5.4	5.9	0.7	29.5	50	27.8	24.3	1.0	104.0
	Caught	20	4.2	1.8	0.7	8.8	20	6.7	7.7	1.0	26.0
Children ≤15	Bought	41	3.3	5.4	0.6	29.5	41	20.0	19.7	1.0	52.0
	Caught	9	2.6	2.0	0.6	6.2	9	8.0	8.9	1.0	23.4

E. Flounder

Population	Type of Meal	N	Mean meal size (oz) per time				N	Mean no. of meals per year			
			Std Dev	Min	Max	Std Dev		Min	Max		
General Population	Bought	102	4.5	3.1	0.6	23.1	105	11.5	16.2	1.0	104.0
	Caught	8	2.8	0.9	1.4	3.4	17	3.3	2.2	1.5	9.0
Sport Fishing Population	Bought	68	5.3	4.1	0.9	23.1	69	14.6	14.2	1.0	52.0
	Caught	119	7.0	5.0	0.4	25.5	127	12.5	22.2	1.0	156.0
Commercial Fishing Population	Bought	15	5.6	4.3	1.9	17.0	17	3.2	15.5	1.0	52.0
	Caught	45	5.4	3.7	1.4	22.7	44	15.9	13.5	1.0	46.8
Limited Income Population	Bought	119	4.8	3.6	0.6	21.3	119	17.9	12.9	1.0	52.0
	Caught	21	7.5	5.0	1.8	22.7	21	19.5	44.9	1.0	156.0
Minority Population	Bought	183	5.2	3.3	0.3	21.3	185	21.8	16.7	1.0	78.0
	Caught	19	6.8	5.8	0.9	17.0	19	5.0	7.7	1.0	35.1
Southeast Asian Minority Pop.	Bought	121	5.1	3.6	0.3	21.3	121	21.6	18.4	1.0	78.0
	Caught	6	11.8	6.1	2.8	17.0	6	4.5	3.7	2.7	12.0
Non-SE Asian Population	Bought	62	5.5	2.7	0.4	10.6	64	22.1	13.1	2.0	52.0
	Caught	13	4.5	4.1	0.9	14.2	13	5.2	9.1	1.0	35.1
Women >15 & ≤45	Bought	85	5.0	3.2	0.8	22.7	87	20.3	20.3	1.0	104.0
	Caught	18	5.3	4.3	1.9	17.0	20	9.7	9.0	1.0	29.3
Children ≤15	Bought	57	2.4	2.0	0.3	8.5	58	14.2	12.4	1.0	52.0
	Caught	21	2.3	1.7	0.4	6.4	24	8.1	8.5	1.0	23.4

Appendix 17. Monthly consumption patterns by species and population. Populations are not mutually exclusive. TOTAL: number of total individuals in study from all populations combined.

A. Largemouth Bass

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	---	---	---	---	---	---	---	---	---	---	---	---
Anglers	8	8	6	9	8	11	11	12	8	7	6	7
Comm Fish	2	2	2	2	2	2	2	2	2	2	2	2
Minorities	3	3	3	3	3	3	3	3	3	3	3	3
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	3	3	3	3	3	3	3	3	3	3	3	3
Limited Inc	4	4	4	4	3	4	4	4	3	3	3	3
Women	1	1	1	1	1	2	2	2	1	1	1	1
Children	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	11	11	9	12	11	14	14	15	11	10	9	10

B. Smallmouth Bass

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	---	---	---	---	---	4	4	4	---	---	---	---
Anglers	2	2	2	2	4	7	7	8	4	2	2	2
Comm Fish	2	2	2	2	2	2	2	2	2	2	2	2
Minorities	8	8	8	8	12	12	14	14	14	8	8	8
Asian	6	6	6	6	10	10	12	12	12	6	6	6
Non-Asian	2	2	2	2	2	2	2	2	2	2	2	2
Limited Inc	7	7	7	7	11	12	14	14	13	7	7	7
Women	4	4	4	4	5	7	7	7	5	4	4	4
Children	1	1	1	1	3	4	4	4	3	1	1	1
TOTAL	11	11	11	11	15	21	23	24	17	11	11	11

C. Striped Bass

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	19	19	19	19	21	42	43	43	25	20	20	19
Anglers	44	44	45	49	62	115	127	123	96	72	62	49
Comm Fish	10	10	13	13	30	66	75	76	55	34	21	10
Minorities	27	27	29	29	29	51	52	48	38	32	31	31
Asian	2	2	2	2	2	11	12	8	8	6	6	6
Non-Asian	25	25	27	27	27	40	40	40	30	26	25	25
Limited Inc	30	30	30	30	33	61	60	56	46	41	40	34
Women	14	14	16	16	19	40	41	43	23	17	17	15
Children	16	16	16	16	16	30	31	31	27	18	17	17
TOTAL	91	91	95	99	129	244	267	265	198	144	121	96

D. Bass, Unspecified

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	---	---	---	---	1	1	1	---	---	---	---	---
Anglers	18	18	18	29	34	37	34	34	26	22	22	19
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	25	25	25	25	26	27	27	27	26	25	25	25
Asian	15	15	15	15	16	16	16	16	16	15	15	15
Non-Asian	10	10	10	10	10	11	11	11	10	10	10	10
Limited Inc	8	8	8	8	8	9	10	10	10	10	8	8
Women	8	8	8	8	8	8	8	8	8	8	8	8
Children	7	7	7	8	8	9	9	9	7	7	7	7
TOTAL	39	39	39	50	55	58	55	55	47	43	43	40

E. Blackfish

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	6	6	6	6	9	11	12	12	9	10	10	6
Anglers	26	26	35	39	52	86	80	81	72	56	47	30
Comm Fish	33	31	32	39	52	68	76	75	64	58	41	34
Minorities	35	35	37	37	37	44	44	50	47	44	37	35
Asian	11	11	13	13	13	15	15	21	23	19	13	11
Non-Asian	24	24	24	24	24	29	29	29	24	25	24	24
Limited Inc	30	30	32	32	32	44	43	49	48	43	34	31
Women	20	19	21	22	21	30	29	31	24	22	20	20
Children	10	10	10	11	12	16	17	17	14	13	10	10
TOTAL	89	87	96	108	133	184	188	191	172	149	119	94

F. Bluefish

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	24	24	25	25	30	64	64	70	43	32	31	24
Anglers	48	47	48	50	61	118	130	166	114	74	57	50
Comm Fish	8	8	8	8	15	42	53	63	40	30	16	9
Minorities	110	109	109	112	118	148	150	152	131	117	109	109
Asian	44	43	43	43	48	53	56	57	56	50	43	43
Non-Asian	66	66	66	69	70	95	94	95	75	67	66	66
Limited Inc	73	72	72	75	80	109	112	115	102	90	81	77
Women	43	43	43	44	49	68	70	74	55	51	46	45
Children	32	32	32	32	34	46	46	50	38	37	36	34
TOTAL	173	172	173	178	202	318	345	397	304	236	203	180

G. Bullhead

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	---	---	---	---	---	2	2	2	---	---	---	---
Anglers	1	1	1	1	1	4	5	4	1	1	1	1
Comm Fish	1	1	1	1	1	1	1	1	1	1	1	1
Minorities	---	---	---	---	---	---	---	---	---	---	---	---
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	---	---	---	---	---	---	---	---	---	---	---	---
Limited Inc	---	---	---	---	---	---	---	---	---	---	---	---
Women	---	---	---	---	---	---	---	---	---	---	---	---
Children	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	1	1	1	1	1	4	6	5	2	1	1	1

H. Butterfish

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	3	3	3	3	3	3	3	3	3	3	3	3
Anglers	12	12	12	12	12	12	12	12	12	12	12	12
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	84	84	81	81	81	89	89	86	81	85	85	88
Asian	72	72	69	69	69	77	77	74	69	73	73	76
Non-Asian	12	12	12	12	12	12	12	12	12	12	12	12
Limited Inc	54	54	51	51	51	59	59	56	51	51	51	54
Women	26	26	25	25	25	28	28	26	25	26	26	27
Children	17	17	17	17	17	20	20	20	17	19	19	19
TOTAL	84	84	81	81	81	89	89	86	81	85	85	88

I. Carp

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	---	---	---	---	---	---	---	---	---	---	---	---
Anglers	2	2	2	2	9	14	16	10	8	4	3	3
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	12	12	12	12	22	32	36	23	20	16	13	13
Asian	8	8	8	8	18	28	32	19	16	12	9	9
Non-Asian	4	4	4	4	4	4	4	4	4	4	4	4
Limited Inc	4	4	4	4	14	21	23	10	7	4	4	4
Women	6	6	6	6	10	12	13	9	8	7	7	7
Children	1	1	1	1	14	5	3	2	1	1	1	---
TOTAL	12	12	12	12	22	32	36	23	20	16	13	13

J. Catfish

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	32	32	32	32	32	38	39	38	35	32	32	32
Anglers	24	24	23	24	37	47	52	49	39	25	23	24
Comm Fish	16	16	16	16	16	16	16	16	16	16	16	16
Minorities	99	99	99	99	124	141	150	149	125	105	99	99
Asian	58	58	58	58	81	95	100	99	78	60	58	58
Non-Asian	41	41	41	41	43	46	50	50	47	45	41	41
Limited Inc	54	54	54	54	61	73	72	68	60	56	54	54
Women	45	45	45	45	55	63	65	62	54	47	45	45
Children	22	22	22	22	24	28	30	30	27	22	22	22
TOTAL	145	145	144	145	174	193	205	201	173	150	144	145

K. Caviar

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	5	5	3	3	3	3	3	3	3	3	3	5
Anglers	---	---	---	---	---	1	1	1	---	---	---	---
Comm Fish	2	2	3	3	3	2	2	2	2	2	2	2
Minorities	---	---	---	---	---	---	---	---	---	---	---	---
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	---	---	---	---	---	---	---	---	---	---	---	---
Limited Inc	---	---	---	---	---	2	2	2	---	---	---	---
Women	1	1	1	1	1	1	1	1	1	1	1	1
Children	1	1	1	1	1	2	2	2	1	1	1	1
TOTAL	7	7	6	6	6	7	7	7	5	5	5	7

L. Cod

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	102	102	96	96	96	97	97	97	96	96	96	102
Anglers	68	68	66	65	63	63	63	63	67	68	70	68
Comm Fish	59	59	66	65	65	65	65	65	63	64	59	59
Minorities	52	52	46	46	46	50	50	50	46	46	46	52
Asian	4	4	4	4	4	4	4	4	4	4	4	4
Non-Asian	48	48	42	42	42	46	46	46	42	42	42	48
Limited Inc	73	73	78	80	80	78	78	78	78	78	73	73
Women	55	55	56	55	55	57	57	57	55	55	54	55
Children	53	53	52	52	52	54	54	54	52	52	49	53
TOTAL	296	297	296	294	291	294	295	295	293	295	292	296

M. Eel

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	6	6	6	6	6	7	7	7	7	6	6	7
Anglers	17	17	16	16	16	21	22	23	18	17	17	17
Comm Fish	15	15	13	14	16	16	16	17	15	15	14	18
Minorities	12	12	13	13	13	15	15	15	12	12	12	12
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	12	12	13	13	13	15	15	15	12	12	12	12
Limited Inc	7	7	6	6	6	7	7	7	6	6	6	6
Women	4	4	5	5	5	8	8	8	5	4	4	4
Children	3	3	3	3	3	3	3	3	3	3	3	3
TOTAL	38	38	35	36	38	45	46	48	41	38	37	42

N. Fish Sticks

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	150	150	150	152	152	150	150	150	150	150	150	150
Anglers	114	114	114	113	113	111	111	111	111	111	113	114
Comm Fish	53	53	53	53	53	53	53	53	53	53	53	53
Minorities	159	159	159	159	159	159	159	159	159	159	159	159
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	159	159	159	159	159	159	159	159	159	159	159	159
Limited Inc	237	237	237	237	237	235	235	235	235	235	235	237
Women	145	145	145	146	146	145	145	145	145	145	145	145
Children	173	173	173	173	173	171	171	171	171	171	171	173
TOTAL	529	529	529	529	529	525	525	525	525	525	527	529

O. Flounder / Flatfish

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	107	107	107	107	122	126	125	128	112	107	107	107
Anglers	106	106	109	118	139	178	177	185	159	136	118	110
Comm Fish	62	62	66	67	76	80	80	80	74	70	65	62
Minorities	204	204	203	203	209	223	229	228	212	212	207	208
Asian	131	131	131	131	137	141	147	145	139	139	135	135
Non-Asian	73	73	72	72	72	82	82	83	73	73	72	73
Limited Inc	134	134	135	135	139	150	151	151	145	138	136	134
Women	103	103	103	103	114	121	121	121	112	109	104	104
Children	69	69	69	69	77	85	85	87	75	71	71	71
TOTAL	449	449	456	466	511	561	564	572	521	491	464	453

P. Haddock

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	37	37	35	35	35	35	35	35	35	35	35	37
Anglers	30	30	30	30	30	30	30	30	30	30	30	30
Comm Fish	18	18	18	18	18	18	18	18	18	18	18	18
Minorities	17	17	17	17	17	17	17	17	17	17	17	17
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	17	17	17	17	17	17	17	17	17	17	17	17
Limited Inc	32	32	32	32	32	32	32	32	32	32	32	32
Women	27	27	25	25	25	25	25	25	25	25	25	27
Children	25	25	25	25	25	25	25	25	25	25	25	25
TOTAL	109	109	107	107	107	107	107	107	107	107	107	109

Q. Halibut

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	18	17	16	16	16	20	20	20	16	16	16	17
Anglers	8	7	7	7	7	9	9	9	7	7	7	7
Comm Fish	8	8	4	4	4	6	4	4	4	4	4	8
Minorities	13	13	13	13	13	13	13	13	13	13	13	13
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	13	13	13	13	13	13	13	13	13	13	13	13
Limited Inc	16	16	16	16	16	15	15	15	16	16	16	16
Women	8	8	8	8	8	10	10	10	8	8	8	8
Children	8	8	8	8	8	8	8	8	8	8	8	8
TOTAL	48	47	42	42	42	49	47	47	42	42	42	47

R. Pickerel

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	---	---	---	---	---	---	---	---	---	---	---	---
Anglers	5	5	5	5	5	5	5	5	5	5	5	5
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	---	---	---	---	---	---	---	---	---	---	---	---
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	---	---	---	---	---	---	---	---	---	---	---	---
Limited Inc	1	1	1	1	1	1	1	1	1	1	1	1
Women	1	1	1	1	1	1	1	1	1	1	1	1
Children	1	1	1	1	1	1	1	1	1	1	1	1
TOTAL	5	5	5	5	5	5	5	5	5	5	5	5

S. Northern Pike

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	---	---	---	---	---	---	---	---	---	---	---	---
Anglers	9	9	5	5	5	5	6	6	6	5	5	9
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	16	16	16	16	16	16	20	20	20	16	16	16
Asian	16	16	16	16	16	16	20	20	20	16	16	16
Non-Asian	---	---	---	---	---	---	---	---	---	---	---	---
Limited Inc	12	12	12	12	12	12	16	16	16	12	12	12
Women	6	6	5	5	5	5	7	7	7	5	5	6
Children	1	1	---	---	---	---	---	---	---	---	---	1
TOTAL	20	20	16	16	16	16	20	20	20	16	16	20

T. White Perch

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	---	---	---	---	---	---	---	---	---	---	---	---
Anglers	7	7	15	15	15	21	21	17	12	11	11	7
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	31	31	31	31	36	47	47	43	35	31	31	31
Asian	19	19	19	19	24	33	33	29	23	19	19	19
Non-Asian	12	12	12	12	12	14	14	14	12	12	12	12
Limited Inc	19	19	19	19	19	29	29	25	19	19	19	19
Women	11	11	12	12	14	19	19	16	14	12	12	11
Children	3	3	4	4	4	7	7	7	4	4	4	3
TOTAL	33	33	41	41	44	55	55	51	41	37	37	33

U. Yellow Perch

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	2	2	2	3	3	3	3	3	3	2	2	2
Anglers	10	10	8	9	9	10	10	10	9	8	8	10
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	14	14	14	14	14	14	14	14	14	14	14	14
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	14	14	14	14	14	14	14	14	14	14	14	14
Limited Inc	14	14	14	14	14	14	14	14	14	14	14	14
Women	6	6	6	6	6	6	6	6	6	6	6	6
Children	4	4	4	4	4	4	4	4	4	4	4	4
TOTAL	25	25	23	24	24	25	25	25	24	23	23	25

V. Perch, unspecified

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	7	7	9	9	9	9	9	9	9	9	7	7
Anglers	8	8	9	15	14	17	16	16	14	11	9	7
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	---	---	---	---	---	---	---	---	---	---	---	---
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	---	---	---	---	---	---	---	---	---	---	---	---
Limited Inc	4	4	4	4	3	4	4	4	4	3	3	3
Women	4	4	4	4	4	4	4	4	4	4	4	4
Children	4	4	4	4	4	4	4	4	4	4	4	4
TOTAL	17	17	19	25	24	27	26	26	24	21	18	16

W. Pollock

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	15	15	14	14	14	14	14	14	14	14	14	15
Anglers	9	9	9	9	9	9	9	9	9	9	9	9
Comm Fish	4	3	3	3	3	5	5	5	3	3	3	3
Minorities	4	4	4	4	4	4	4	4	4	4	4	4
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	4	4	4	4	4	4	4	4	4	4	4	4
Limited Inc	---	---	---	---	---	---	---	---	---	---	---	---
Women	7	7	6	6	6	6	6	6	6	6	6	7
Children	5	5	5	5	5	5	5	5	5	5	5	5
TOTAL	28	27	26	26	26	28	28	28	26	26	26	27

X. Porgy

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	3	3	3	3	7	8	10	8	6	5	5	3
Anglers	25	25	25	25	30	60	68	72	51	35	28	25
Comm Fish	5	5	6	6	6	16	20	24	18	10	5	5
Minorities	149	149	150	150	163	191	194	197	171	155	152	151
Asian	64	64	64	64	74	78	80	84	80	70	66	66
Non-Asian	85	85	86	86	89	113	114	113	91	85	86	85
Limited Inc	101	101	101	101	105	119	122	127	116	102	101	101
Women	51	51	52	52	56	68	70	71	59	54	52	52
Children	39	39	39	39	40	51	52	51	42	39	39	39
TOTAL	165	165	166	166	183	238	252	261	219	186	171	167

Y. Salmon

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	105	105	106	106	111	114	114	114	108	106	105	105
Anglers	63	63	63	63	63	67	67	67	64	65	64	63
Comm Fish	45	45	45	45	47	47	47	47	45	45	45	45
Minorities	40	40	40	40	40	41	41	41	40	40	40	40
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	40	40	40	40	40	41	41	41	40	40	40	40
Limited Inc	43	43	43	43	43	43	43	43	43	43	43	43
Women	43	43	43	43	47	49	49	49	44	43	43	43
Children	26	26	26	26	28	28	28	28	28	26	26	26
TOTAL	241	241	242	242	249	255	255	255	245	243	242	241

Z. Sole

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	70	70	70	70	70	71	71	71	70	70	70	70
Anglers	24	24	24	24	24	25	25	25	24	24	24	24
Comm Fish	14	14	14	14	14	14	14	14	14	14	14	14
Minorities	23	23	23	23	23	24	24	24	23	23	23	23
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	23	23	23	23	23	24	24	24	23	23	23	23
Limited Inc	16	16	16	16	16	18	18	18	16	16	16	16
Women	29	29	29	29	29	32	32	32	29	29	29	29
Children	24	24	24	24	24	24	24	24	24	24	24	24
TOTAL	126	126	126	126	126	130	130	130	126	126	126	126

AA. Sunfish (unspecified)

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	2	2	4	4	5	7	7	7	4	4	2	2
Anglers	18	18	23	28	25	41	43	37	25	20	18	18
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	18	18	24	26	31	95	107	81	38	26	24	26
Asian	18	18	24	26	31	92	104	78	38	26	24	26
Non-Asian	---	---	---	---	---	3	3	3	---	---	---	---
Limited Inc	18	18	24	26	24	65	76	50	28	19	17	19
Women	4	4	6	7	8	26	29	22	9	6	5	5
Children	4	4	5	5	5	10	10	5	5	4	4	4
TOTAL	25	25	34	40	45	110	120	94	49	36	31	32

BB. Swordfish

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	117	117	118	117	121	124	124	125	118	116	116	116
Anglers	61	61	61	60	60	63	63	63	60	60	60	60
Comm Fish	50	50	50	50	50	56	57	59	54	53	51	50
Minorities	54	54	54	54	54	60	62	62	64	54	54	54
Asian	3	3	3	3	3	3	5	5	5	3	3	3
Non-Asian	51	51	51	51	51	57	57	57	59	51	51	51
Limited Inc	40	40	40	40	42	54	54	54	48	40	40	40
Women	62	62	62	62	65	72	73	75	67	63	62	62
Children	34	34	34	34	35	40	41	41	40	36	34	34
TOTAL	277	277	278	277	281	305	308	311	292	279	277	276

CC. Tilapia

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	9	9	9	9	9	9	9	9	9	9	9	9
Anglers	1	1	1	1	1	1	1	1	1	1	1	1
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	4	4	4	4	4	4	4	4	4	4	4	4
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	4	4	4	4	4	4	4	4	4	4	4	4
Limited Inc	1	1	1	1	1	1	1	1	1	1	1	1
Women	2	2	2	2	2	2	2	2	2	2	2	2
Children	5	5	5	5	5	5	5	5	5	5	5	5
TOTAL	11	11	11	11	11	11	11	11	11	11	11	11

DD. Trout, unspecified

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	41	41	41	45	48	58	58	57	47	41	41	41
Anglers	68	67	69	128	132	131	118	105	90	81	77	70
Comm Fish	7	7	8	18	18	16	7	7	7	7	7	7
Minorities	89	89	89	93	104	138	133	119	105	98	89	89
Asian	56	56	56	57	70	96	92	78	68	65	56	56
Non-Asian	33	33	33	36	34	42	41	41	37	33	33	33
Limited Inc	79	79	80	83	92	105	101	94	83	81	79	79
Women	52	52	52	54	61	74	70	66	58	56	52	52
Children	34	34	34	37	39	44	44	40	37	35	34	34
TOTAL	207	206	209	278	291	314	291	272	241	226	216	209

EE. Tuna, canned

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	306	306	306	306	311	312	314	314	309	309	310	309
Anglers	415	416	416	415	416	421	421	421	416	416	416	416
Comm Fish	156	156	156	156	156	156	156	156	156	156	156	156
Minorities	437	437	437	436	438	453	453	454	437	437	438	437
Asian	89	89	89	89	89	89	89	89	89	89	89	89
Non-Asian	348	348	348	347	349	364	364	365	348	348	349	348
Limited Inc	671	671	669	669	669	681	681	682	669	669	669	671
Women	372	373	371	371	373	378	378	378	371	371	371	373
Children	324	324	324	324	324	335	335	336	324	324	325	324
TOTAL	1,437	1,438	1,436	1,435	1,440	1,461	1,463	1,464	1,439	1,439	1,440	1,441

FF. Tuna, Fresh

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	76	76	77	76	81	96	99	103	79	76	76	76
Anglers	77	77	77	77	78	96	98	105	85	84	82	78
Comm Fish	35	35	33	33	32	44	52	67	57	42	35	37
Minorities	118	119	120	119	119	124	124	126	121	121	119	119
Asian	83	84	84	84	84	84	84	84	84	84	84	84
Non-Asian	35	35	36	35	35	40	40	42	37	37	35	35
Limited Inc	94	95	95	95	95	99	101	106	104	97	95	95
Women	67	68	68	68	70	80	83	88	73	70	69	68
Children	32	32	32	32	32	34	34	39	35	32	32	32
Total	275	276	275	274	278	317	330	356	308	290	281	279

GG. Turbot

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	3	3	3	3	3	3	3	3	3	3	3	3
Anglers	1	1	1	1	1	1	1	1	1	1	1	1
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	---	---	---	---	---	---	---	---	---	---	---	---
Asian	---	---	---	---	---	---	---	---	---	---	---	---
Non-Asian	---	---	---	---	---	---	---	---	---	---	---	---
Limited Inc	---	---	---	---	---	---	---	---	---	---	---	---
Women	1	1	1	1	1	1	1	1	1	1	1	1
Children												
TOTAL	3	3	3	3	3	3	3	3	3	3	3	3

HH. Freshwater "Whitefish"

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	2	2	2	2	2	6	6	6	2	2	2	2
Anglers	6	6	6	6	6	7	8	8	7	6	6	6
Comm Fish	3	3	3	3	3	3	3	3	3	3	3	3
Minorities	42	42	42	42	42	63	63	63	59	57	42	42
Asian	22	22	22	22	22	39	39	39	39	37	22	22
Non-Asian	20	20	20	20	20	24	24	24	20	20	20	20
Limited Inc	17	17	17	17	17	30	30	30	30	28	17	17
Women	12	12	12	12	12	19	19	19	17	16	12	12
Children	12	12	12	12	12	17	17	17	16	16	12	12
TOTAL	44	44	44	44	44	65	65	65	61	59	44	44

II. Whiting - Kingfish

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	---	---	---	---	---	---	---	---	---	---	---	---
Anglers	3	3	3	3	3	3	3	3	3	3	3	3
Comm Fish	---	---	---	---	---	---	---	---	---	---	---	---
Minorities	22	22	22	22	22	22	22	22	22	22	22	22
Asian	22	22	22	22	22	22	22	22	22	22	22	22
Non-Asian	---	---	---	---	---	---	---	---	---	---	---	---
Limited Inc	16	16	16	16	16	16	16	16	16	16	16	16
Women	6	6	6	6	6	6	6	6	6	6	6	6
Children	4	4	4	4	4	4	4	4	4	4	4	4
TOTAL	22	22	22	22	22	22	22	22	22	22	22	22

JJ. Clams, whole, cooked

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	295	292	286	286	297	336	351	349	304	291	289	297
Anglers	342	339	333	336	348	403	415	412	357	341	337	342
Comm Fish	161	161	155	156	165	182	194	192	172	164	163	163
Minorities	286	285	280	280	289	320	325	323	296	280	279	286
Asian	81	81	81	81	86	97	103	103	95	81	81	81
Non-Asian	205	204	199	199	203	223	222	220	201	199	198	205
Limited Inc	359	359	349	349	359	408	417	416	366	351	352	359
Women	285	285	274	274	284	324	332	330	288	274	272	287
Children	149	147	143	143	143	170	172	172	147	146	145	149
TOTAL	1,107	1,101	1,072	1,076	1,111	1,255	1,294	1,288	1,141	1,091	1,085	1,110

KK. Blue Crab

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	52	52	52	52	56	72	81	86	63	57	55	52
Anglers	84	82	80	80	98	142	168	176	137	103	90	87
Comm Fish	35	35	35	35	43	79	90	106	63	46	40	37
Minorities	115	107	91	91	159	247	283	277	207	180	137	127
Asian	39	29	19	19	87	139	171	164	119	99	56	48
Non-Asian	76	78	72	72	72	108	112	113	88	81	81	79
Limited Inc	104	99	96	97	136	184	217	211	171	153	120	113
Women	80	77	72	72	90	125	139	141	103	97	84	82
Children	35	33	31	31	44	71	81	77	55	45	38	36
TOTAL	273	265	248	249	332	496	574	598	433	355	303	287

LL. Lobster

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	163	157	155	160	188	265	301	286	181	164	158	162
Anglers	265	263	263	270	282	365	368	365	278	271	264	266
Comm Fish	102	101	105	109	150	187	192	203	159	150	120	107
Minorities	301	303	307	307	317	347	349	352	309	296	296	304
Asian	39	39	39	39	48	51	55	57	49	39	39	39
Non-Asian	262	264	268	268	269	296	294	295	260	257	257	265
Limited Inc	333	336	339	336	350	400	403	401	343	340	334	334
Women	230	227	228	230	243	309	327	327	244	233	229	230
Children	140	140	144	144	150	168	171	172	150	144	141	141
Total	859	851	857	873	955	1,169	1,223	1,225	953	912	869	869

MM. Mussels

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	47	47	46	47	47	55	57	56	47	47	47	48
Anglers	65	65	63	63	71	89	89	84	71	66	65	67
Comm Fish	32	32	31	33	39	52	54	57	43	35	33	33
Minorities	65	65	65	66	75	80	82	74	69	65	65	65
Asian	32	32	32	32	39	39	42	34	34	32	32	32
Non-Asian	33	33	33	34	36	41	40	40	35	33	33	33
Limited Inc	45	45	45	45	50	62	67	57	48	45	45	45
Women	40	40	40	40	45	57	60	58	44	40	40	40
Children	21	21	21	21	21	23	23	23	21	21	21	21
TOTAL	193	193	190	193	209	257	265	257	213	198	195	197

NN. Oysters

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	70	69	66	66	68	77	80	78	68	68	69	77
Anglers	66	66	62	63	63	72	74	73	66	67	66	67
Comm Fish	43	43	33	34	32	35	38	37	36	36	42	48
Minorities	106	106	105	105	106	111	115	114	113	113	105	106
Asian	14	14	14	14	14	14	14	14	14	14	14	14
Non-Asian	92	92	91	91	92	97	101	100	99	99	91	92
Limited Inc	75	75	73	73	73	75	75	74	74	75	74	77
Women	57	57	55	55	56	59	59	60	56	57	57	61
Children	33	33	33	33	33	35	36	36	34	34	33	33
TOTAL	260	258	243	245	244	266	276	272	258	258	255	272

OO. Scallops

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	160	160	160	160	163	166	167	167	161	161	160	160
Anglers	105	103	103	103	103	111	111	111	106	104	104	105
Comm Fish	57	55	56	56	56	55	55	55	59	62	61	57
Minorities	82	81	81	81	81	87	87	87	87	81	81	82
Asian	6	6	6	6	6	12	12	12	12	6	6	6
Non-Asian	76	75	75	75	75	75	75	75	75	75	75	76
Limited Inc	147	146	146	146	146	154	154	154	152	147	147	147
Women	123	121	121	121	121	126	126	126	123	123	123	123
Children	67	66	66	66	66	69	69	69	66	67	67	67
TOTAL	448	444	445	445	448	463	464	464	455	453	451	448

PP. Shrimp

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	286	286	282	282	286	290	290	290	286	282	282	288
Anglers	326	327	331	331	329	340	340	340	326	323	325	343
Comm Fish	117	117	118	118	118	121	121	121	117	117	117	117
Minorities	801	801	801	801	801	817	817	817	801	801	801	801
Asian	501	501	501	501	501	501	501	501	501	501	501	501
Non-Asian	300	300	300	300	300	316	316	316	300	300	300	300
Limited Inc	713	713	715	715	719	731	731	731	714	709	709	716
Women	398	398	399	399	399	406	406	406	396	396	396	408
Children	284	284	284	284	284	297	297	297	283	282	282	288
TOTAL	1,486	1,487	1,486	1,486	1,488	1,521	1,521	1,521	1,486	1,479	1,481	1,516

QQ. Squid

	Jan	Feb	March	April	May	June	July	August	Sept	Oct	Nov	Dec
General Pop	72	72	72	72	72	73	73	73	72	73	73	75
Anglers	60	60	61	60	60	62	62	62	58	58	60	63
Comm Fish	35	35	35	35	38	35	35	35	35	35	35	37
Minorities	258	258	258	258	268	268	268	268	258	258	258	258
Asian	143	143	143	143	153	153	153	153	143	143	143	143
Non-Asian	115	115	115	115	115	115	115	115	115	115	115	115
Limited Inc	132	132	132	132	142	142	142	142	133	132	132	132
Women	99	99	99	99	103	105	105	105	99	99	99	101
Children	52	52	52	52	52	52	52	52	52	53	53	53
TOTAL	392	392	393	392	403	406	403	403	391	391	393	400

Appendix 18A-I. Mean consumption in total grams per day by species and population

A. General Population

Species	No. of consumers	Mean Total grams/day	Standard Deviation	Minimum	Maximum	Mean Total ounces/day	Standard Deviation	Minimum	Maximum
Blackfish	19	81.18	82.51	17.24	352.06	2.86	2.91	0.61	12.41
Bluefish	77	48.30	58.28	2.06	352.06	1.70	2.06	0.07	12.41
Butterfish	3	271.85	138.93	111.44	352.06	9.59	4.90	3.93	12.41
Cod	99	39.38	32.46	1.07	143.80	1.39	1.14	0.04	5.07
Fish Sticks	150	32.97	41.67	0.34	352.06	1.16	1.47	0.01	12.41
Flounder / Fluke	129	49.50	55.83	3.87	494.98	1.75	1.97	0.14	17.45
Haddock	45	37.90	33.49	2.22	133.87	1.34	1.18	0.08	4.72
Halibut	22	46.54	27.78	8.79	133.87	1.64	0.98	0.31	4.72
Pollock	19	37.11	25.07	5.52	100.78	1.31	0.88	0.19	3.55
Porgy	14	77.51	89.40	7.65	352.06	2.73	3.15	0.27	12.41
Sole	67	27.39	26.65	1.07	186.60	0.97	0.94	0.04	6.58
Striped Bass	43	45.39	30.85	4.87	122.51	1.60	1.09	0.17	4.32
Swordfish	124	40.38	29.90	2.06	161.80	1.42	1.05	0.07	5.71
Tuna, canned	317	34.94	46.88	0.34	494.98	1.23	1.65	0.01	17.45
Tuna, fresh	103	40.86	28.67	0.34	133.87	1.44	1.01	0.01	4.72
Turbot	3	22.55	6.10	18.65	29.58	0.79	0.22	0.66	1.04
Whiting / Kingfish	---	---	---	---	---	---	---	---	---
Caviar	5	29.87	6.87	18.96	37.06	1.05	0.24	0.67	1.31
I.M Bass	---	---	---	---	---	---	---	---	---
SM Bass	4	38.18	36.47	5.52	90.37	1.35	1.29	0.19	3.19
Bass, unspecified	1	100.78	---	100.78	100.78	3.55	---	3.55	3.55
Bullhead	2	51.12	35.40	26.09	76.16	1.80	1.25	0.92	2.69
Carp	---	---	---	---	---	---	---	---	---
Catfish	40	68.14	64.87	5.52	352.06	2.40	2.29	0.19	12.41
Eel	8	72.37	115.19	13.04	352.06	2.55	4.06	0.35	12.41
Northern Pike	---	---	---	---	---	---	---	---	---
White Perch	1	22.93	---	22.93	22.93	0.81	---	0.81	0.81
Yellow Perch	3	89.18	1.04	88.58	90.37	3.14	0.04	3.12	3.19
Perch, unspecified	9	28.59	27.62	1.07	83.49	1.01	0.97	0.04	2.94
Pickrel	---	---	---	---	---	---	---	---	---
Salmon	112	37.92	44.42	0.31	352.06	1.34	1.57	0.01	12.41
Sunfish, unspecified	5	66.02	20.25	46.25	90.37	2.33	0.71	1.63	3.19
Tilapia	9	65.70	111.82	10.04	352.06	2.32	3.94	0.35	12.41
Trout, unspecified	58	47.24	55.62	0.71	352.06	1.67	1.96	0.03	12.41
Whitefish	6	31.87	39.97	7.65	112.99	1.12	1.41	0.27	3.98
Walleye	2	28.41	2.91	26.35	30.47	1.00	0.10	0.93	1.07
Clams	369	40.94	47.58	0.26	494.98	1.44	1.68	0.01	17.45
Blue crab	103	50.80	58.76	5.54	352.06	1.79	2.07	0.20	12.41
Lobster	346	43.23	57.21	1.12	494.98	1.52	2.02	0.04	17.45
Mussels	58	53.22	63.96	1.83	352.06	1.88	2.26	0.06	12.41
Oysters	92	44.18	38.32	3.38	186.60	1.56	1.35	0.12	6.58
Scallops	163	46.57	58.80	2.06	494.98	1.64	2.07	0.07	17.45
Shrimp	301	37.12	47.38	0.03	494.98	1.31	1.67	0.00	17.45
Squid	64	49.86	49.49	2.56	352.06	1.76	1.74	0.09	12.41
Total Fish / Scafood	437	27.70	42.66	0	494.80	0.98	1.50	0	17.45

B. Anglers and Families

Species	No. of consumers	Mean Total grams/day	Standard Deviation	Minimum	Maximum	Mean Total ounces/day	Standard Deviation	Minimum	Maximum
Blackfish	119	79.74	86.49	0.86	586.20	2.81	3.05	0.03	20.67
Bluefish	180	66.96	70.32	0.34	586.20	2.36	2.48	0.01	20.67
Butterfish	12	33.00	9.76	22.55	54.04	1.16	0.34	0.80	1.91
Cod	76	60.58	97.06	2.06	586.20	2.14	3.42	0.07	20.67
Fish Sticks	132	54.30	85.34	0.69	586.20	1.91	3.01	0.02	20.67
Flounder / Fluke	222	68.21	81.14	0.77	586.20	2.41	2.86	0.03	20.67
Haddock	32	72.68	107.19	3.18	572.08	2.56	3.78	0.11	20.17
Halibut	11	39.44	29.60	4.55	90.37	1.39	1.04	0.16	3.19
Pollock	9	85.63	97.71	8.09	322.96	3.02	3.45	0.29	11.39
Porgy	78	75.13	84.14	2.06	586.20	2.65	2.97	0.07	20.67
Sole	27	40.04	31.20	0.34	117.51	1.41	1.10	0.01	4.14
Striped Bass	151	66.57	80.72	0.34	586.20	2.35	2.85	0.01	20.67
Swordfish	69	64.95	84.56	0.34	586.20	2.29	2.98	0.01	20.67
Tuna, canned	432	57.83	74.05	0.89	586.20	2.04	2.61	0.03	20.67
Tuna, fresh	110	59.50	72.14	0.86	586.20	2.10	2.54	0.03	20.67
Turbot	1	19.41	---	19.41	19.41	0.68	---	0.68	0.68
Whiting / Kingfish	3	189.63	30.84	154.02	207.44	6.69	1.09	5.43	7.31
Caviar	1	63.81	---	63.81	63.81	2.25	---	2.25	2.25
LM Bass	15	164.00	177.04	12.02	572.08	5.78	6.24	0.42	20.17
SM Bass	9	48.09	32.73	20.31	100.95	1.70	1.15	0.72	3.56
Bass, unspecified	39	64.28	44.80	2.06	245.67	2.27	1.58	0.07	8.66
Bullhead	5	49.78	30.21	9.38	76.16	1.76	1.07	0.33	2.69
Carp	17	108.82	73.13	25.96	245.67	3.84	2.58	0.92	8.66
Catfish	61	86.13	84.40	2.06	479.53	3.04	2.98	0.07	16.91
Eel	24	108.23	107.69	2.06	479.53	3.82	3.80	0.07	16.91
Northern Pike	10	72.79	24.21	25.03	95.00	2.57	0.85	0.88	3.35
White Perch	25	73.83	46.54	26.72	207.92	2.60	1.64	0.94	7.33
Yellow Perch	13	58.39	30.75	7.31	90.37	2.06	1.08	0.26	3.19
Perch, unspecified	21	117.76	118.52	5.15	479.53	4.15	4.18	0.18	16.91
Pickarel	5	156.69	180.47	75.95	479.53	5.53	6.36	2.68	16.91
Salmon	71	43.28	47.35	2.06	322.96	1.53	1.67	0.07	11.39
Sunfish, unspecified	48	69.46	87.09	1.91	479.53	2.45	3.07	0.07	16.91
Tilapia	3	31.89	33.61	12.48	70.70	1.12	1.19	0.44	2.49
Trout, unspecified	166	61.20	64.79	0.77	479.53	2.16	2.28	0.03	16.91
Whitefish	8	142.88	91.59	7.65	245.67	5.04	3.23	0.27	8.66
Walleye	2	7.27	2.99	5.15	9.38	0.26	0.11	0.18	0.33
Clams	450	67.66	86.86	0.69	586.20	2.39	3.06	0.02	20.67
Blue crab	200	75.66	85.46	2.06	586.20	2.67	3.05	0.07	20.67
Lobster	397	59.49	66.80	0.53	586.20	2.10	2.35	0.02	20.67
Mussels	99	64.10	75.25	0.34	586.20	2.26	2.65	0.01	20.67
Oysters	88	64.83	58.92	2.06	302.90	2.29	2.08	0.07	10.68
Scallops	114	55.48	68.90	2.06	586.20	1.96	2.43	0.07	20.67
Shrimp	369	55.11	59.76	0.15	572.08	1.94	2.11	0.01	20.17
Squid	71	57.61	65.84	0.34	364.10	2.03	2.32	0.01	12.84
Total Fish / Seafood	502	51.12	66.06	0	585.99	1.80	2.33	0	20.67

C. Commercial Fishermen and Families

Species	No. of consumers	Mean Total grams/day	Standard Deviation	Minimum	Maximum	Mean Total ounces/day	Standard Deviation	Minimum	Maximum
Blackfish	89	69.25	70.83	4.12	504.48	2.44	2.50	0.15	17.79
Bluefish	70	61.66	76.66	1.03	504.48	2.19	2.70	0.04	17.79
Butterfish	---	---	---	---	---	---	---	---	---
Cod	73	65.25	73.07	1.03	504.48	2.30	2.58	0.04	17.79
Fish Sticks	56	39.73	74.96	1.03	504.48	1.40	2.64	0.04	17.79
Flounder / Fluke	83	73.05	84.26	3.33	504.48	2.58	2.97	0.12	17.79
Haddock	17	70.94	47.38	9.83	152.11	2.50	1.67	0.35	5.36
Halibut	8	72.06	45.88	22.70	152.11	2.54	1.62	0.80	5.36
Pollock	6	72.49	50.12	20.17	152.11	2.56	1.77	0.71	5.36
Porgy	25	83.22	102.47	16.02	504.48	2.93	3.61	0.56	17.79
Sole	14	58.01	47.26	12.58	143.30	2.05	1.67	0.44	5.05
Striped Bass	89	60.43	71.78	1.03	504.48	2.13	2.53	0.04	17.79
Swordfish	60	74.22	84.55	1.03	504.48	2.62	2.98	0.04	17.79
Tuna, canned	155	49.64	57.26	1.37	504.48	1.75	2.02	0.05	17.79
Tuna, fresh	75	72.48	72.92	3.82	504.48	2.56	2.57	0.13	17.79
Turbot	---	---	---	---	---	---	---	---	---
Whiting / Kingfish	---	---	---	---	---	---	---	---	---
Caviar	2	96.91	0.77	96.36	97.45	3.42	0.03	3.40	3.44
LM Bass	2	124.10	11.79	115.76	132.43	4.38	0.42	4.08	4.67
SM Bass	2	124.10	11.79	115.76	132.43	4.38	0.42	4.08	4.67
Bass, unspecified	---	---	---	---	---	---	---	---	---
Bullhead	1	27.94	---	27.94	27.94	0.99	---	0.99	0.99
Carp	---	---	---	---	---	---	---	---	---
Catfish	17	119.17	128.67	14.30	504.48	4.20	4.54	0.50	17.79
Eel	24	99.09	103.38	22.82	504.48	3.49	3.65	0.80	17.79
Northern Pike	---	---	---	---	---	---	---	---	---
White Perch	---	---	---	---	---	---	---	---	---
Yellow Perch	---	---	---	---	---	---	---	---	---
Perch, unspecified	---	---	---	---	---	---	---	---	---
Pickrel	---	---	---	---	---	---	---	---	---
Salmon	48	77.72	83.92	3.33	504.48	2.74	2.96	0.12	17.79
Sunfish, unspecified	---	---	---	---	---	---	---	---	---
Tilapia	---	---	---	---	---	---	---	---	---
Trout, unspecified	18	34.97	24.32	9.96	99.39	1.23	0.86	0.35	3.50
Whitefish	3	238.91	71.54	156.30	280.21	8.42	2.52	5.51	9.88
Walleye	---	---	---	---	---	---	---	---	---
Clams	210	61.15	73.99	1.03	504.48	2.16	2.61	0.04	17.79
Blue crab	110	69.73	79.37	2.93	504.48	2.46	2.80	0.10	17.79
Lobster	211	56.57	55.27	0.27	504.48	1.99	1.95	0.01	17.79
Mussels	62	76.61	91.64	1.03	504.48	2.70	3.23	0.04	17.79
Oysters	60	83.01	96.19	1.03	504.48	2.93	3.39	0.04	17.79
Scallops	69	71.23	72.90	3.33	504.48	2.51	2.57	0.12	17.79
Shrimp	126	60.39	66.08	3.33	504.48	2.13	2.33	0.12	17.79
Squid	39	90.39	89.56	13.52	504.48	3.19	3.16	0.48	17.79
Total Fish / Seafood	178	47.35	58.49	0	504.30	1.67	2.06	0	17.79

D. Minority Families

Species	No. of consumers	Mean Total grams/day	Standard Deviation	Minimum	Maximum	Mean Total ounces/day	Standard Deviation	Minimum	Maximum
Blackfish	54	126.97	97.18	2.40	415.49	4.48	3.43	0.08	14.65
Bluefish	149	93.19	81.06	1.87	430.16	3.29	2.86	0.07	15.17
Butterfish	96	68.54	63.59	1.90	352.06	2.42	2.24	0.07	12.41
Cod	50	70.63	66.99	4.39	304.74	2.49	2.36	0.15	10.75
Fish Sticks	156	67.05	76.89	2.96	430.16	2.36	2.71	0.10	15.17
Flounder / Fluke	225	64.52	53.71	1.90	352.06	2.76	1.89	0.07	12.41
Haddock	17	76.73	77.22	8.26	304.74	2.71	2.72	0.29	10.75
Halibut	13	5.22	6.26	1.71	24.77	0.18	0.22	0.06	0.87
Pollock	4	53.97	12.70	38.68	69.02	1.90	0.45	1.36	2.43
Porgy	202	76.54	63.48	4.39	421.37	2.70	2.24	0.15	14.86
Sole	18	51.84	61.34	1.68	186.60	1.83	2.16	0.06	6.58
Striped Bass	52	65.41	75.12	0.55	421.37	2.31	2.65	0.02	18.86
Swordfish	58	48.84	54.27	0.47	280.21	1.72	1.91	0.02	9.88
Tuna, canned	453	60.08	64.38	1.71	430.16	2.12	2.27	0.06	15.17
Tuna, fresh	121	67.86	51.20	5.10	282.77	2.39	1.81	0.18	9.97
Turbot	---	---	---	---	---	---	---	---	---
Whiting / Kingfish	22	83.32	69.76	18.79	209.52	2.94	2.46	0.66	7.39
Caviar	---	---	---	---	---	---	---	---	---
LM Bass	3	110.78	125.68	33.32	255.79	3.91	4.43	1.17	9.02
SM Bass	14	56.95	31.01	11.52	111.16	2.01	1.09	0.41	3.92
Bass, unspecified	27	67.63	49.74	7.05	245.67	2.38	1.75	0.25	8.66
Bullhead	---	---	---	---	---	---	---	---	---
Carp	37	79.27	58.55	1.90	245.67	2.80	2.06	0.07	8.66
Catfish	154	76.25	57.30	2.96	352.06	2.69	2.02	0.10	12.41
Eel	15	109.91	109.06	10.04	352.06	3.88	3.85	0.35	12.41
Northern Pike	20	76.77	41.46	20.40	158.09	2.71	1.46	0.72	5.57
White Perch	49	71.05	39.32	12.69	207.92	2.51	1.39	0.45	7.33
Yellow Perch	14	158.09	108.50	42.37	415.49	5.57	3.83	1.49	14.65
Perch, unspecified	---	---	---	---	---	---	---	---	---
Pickrel	---	---	---	---	---	---	---	---	---
Salmon	39	95.88	103.16	2.96	421.37	3.38	3.64	0.10	14.86
Sunfish, unspecified	111	59.40	47.86	1.91	245.67	2.09	1.69	0.07	8.66
Tilapia	4	123.65	158.91	10.04	352.06	4.36	5.60	0.35	12.41
Trout, unspecified	142	66.06	51.16	0.99	352.06	2.33	1.80	0.03	12.41
Whitefish	65	79.46	67.00	2.56	280.21	2.80	2.36	0.09	9.88
Walleye	---	---	---	---	---	---	---	---	---
Clams	327	75.44	70.04	2.96	415.49	2.66	2.47	0.10	14.65
Blue crab	294	75.69	66.96	1.57	430.16	2.67	2.36	0.06	15.17
Lobster	381	62.61	59.47	0.34	352.06	2.21	2.10	0.01	12.41
Mussels	78	80.94	68.20	0.57	352.06	2.85	2.40	0.02	12.41
Oysters	107	63.01	66.43	2.40	415.49	2.22	2.34	0.08	14.65
Scallops	78	75.38	65.91	11.37	352.06	2.66	2.32	0.40	12.41
Shrimp	816	61.91	59.79	0.13	430.16	2.18	2.11	0.00	15.17
Squid	256	67.65	47.60	4.69	352.06	2.38	1.68	0.17	12.41
Total Fish / Seafood	861	50.29	57.52	0	430.01	1.77	2.03	0	15.17

E. Southeast Asian Families

Species	No. of consumers	Mean Total grams/day	Standard Deviation	Minimum	Maximum	Mean Total ounces/day	Standard Deviation	Minimum	Maximum
Blackfish	23	137.59	66.38	34.39	245.67	4.85	2.34	1.21	8.66
Bluefish	57	98.36	68.09	7.05	245.67	3.47	2.40	0.25	8.66
Butterfish	84	63.51	49.59	1.90	244.64	2.24	1.75	0.07	8.63
Cod	4	93.71	26.47	71.15	129.77	3.30	0.93	2.51	4.58
Fish Sticks	---	---	---	---	---	---	---	---	---
Flounder / Fluke	147	72.91	55.77	1.90	244.64	2.57	1.97	0.07	8.63
Haddock	---	---	---	---	---	---	---	---	---
Halibut	---	---	---	---	---	---	---	---	---
Pollock	---	---	---	---	---	---	---	---	---
Porgy	86	80.17	43.68	8.50	188.46	2.83	1.54	0.30	6.65
Sole	---	---	---	---	---	---	---	---	---
Striped Bass	12	83.42	64.12	26.72	207.92	2.94	2.26	0.94	7.33
Swordfish	5	64.48	22.31	36.93	93.72	2.27	0.79	1.30	3.30
Tuna, canned	89	60.95	49.25	2.11	244.64	2.15	1.74	0.07	8.63
Tuna, fresh	84	61.25	33.90	5.10	157.38	2.16	1.20	0.18	5.55
Turbot	---	---	---	---	---	---	---	---	---
Whiting / Kingfish	22	83.32	69.76	18.79	209.52	2.94	2.46	0.66	7.39
Caviar	---	---	---	---	---	---	---	---	---
LM Bass	---	---	---	---	---	---	---	---	---
SM Bass	12	60.06	32.53	11.52	111.16	2.12	1.15	0.41	3.92
Bass, unspecified	16	70.88	61.62	7.05	245.67	2.50	2.17	0.25	8.66
Bullhead	---	---	---	---	---	---	---	---	---
Carp	33	80.59	61.73	1.90	245.67	2.84	2.18	0.07	8.66
Catfish	104	78.36	50.46	4.34	245.67	2.76	1.78	0.15	8.66
Eel	---	---	---	---	---	---	---	---	---
Northern Pike	20	76.77	41.46	20.40	158.09	2.71	1.46	0.72	5.57
White Perch	33	73.99	42.22	26.72	207.91	2.61	1.49	0.94	7.33
Yellow Perch	---	---	---	---	---	---	---	---	---
Perch, unspecified	---	---	---	---	---	---	---	---	---
Pickrel	---	---	---	---	---	---	---	---	---
Salmon	---	---	---	---	---	---	---	---	---
Sunfish, unspecified	110	59.25	48.05	1.91	245.67	2.09	1.69	0.07	8.66
Tilapia	---	---	---	---	---	---	---	---	---
Trout, unspecified	98	70.40	49.12	0.99	245.67	2.48	1.73	0.03	8.66
Whitefish	41	83.53	63.51	2.56	245.67	2.95	2.24	0.09	8.66
Walleye	---	---	---	---	---	---	---	---	---
Clams	103	75.61	53.86	10.16	244.64	2.67	1.90	0.36	8.63
Blue crab	172	71.51	51.46	5.16	244.64	2.52	1.81	0.18	8.63
Lobster	60	59.02	44.89	1.90	188.46	2.08	1.58	0.07	6.65
Mussels	42	83.25	58.96	11.25	244.64	2.94	2.08	0.40	8.63
Oysters	14	55.20	29.95	20.40	95.00	1.95	1.06	0.72	3.35
Scallops	12	135.73	63.04	55.57	209.52	4.79	2.22	1.96	7.39
Shrimp	504	60.18	48.18	0.13	244.64	2.12	1.70	0.00	8.63
Squid	153	70.41	46.22	18.36	188.46	2.48	1.63	0.65	6.65
Total Fish / Seafood	329	59.18	49.25	0.13	245.58	2.09	1.74	0.01	8.66

F. Non-Southeast Asian Minorities

Species	No. of consumers	Mean Total grams/day	Standard Deviation	Minimum	Maximum	Mean Total ounces/day	Standard Deviation	Minimum	Maximum
Blackfish	31	119.09	115.34	2.40	415.49	4.20	4.07	0.08	14.65
Bluefish	92	89.99	88.35	1.87	430.16	3.17	3.12	0.07	15.17
Butterfish	12	103.77	121.71	2.40	352.06	3.66	4.29	0.08	12.41
Cod	46	68.62	69.20	4.39	304.74	2.42	2.44	0.15	10.75
Fish Sticks	156	67.05	76.89	2.96	430.16	2.36	2.71	0.10	15.17
Flounder / Fluke	78	48.71	45.89	2.40	352.06	1.72	1.62	0.08	12.41
Haddock	17	76.73	77.22	8.26	304.74	2.71	2.72	0.29	10.75
Halibut	13	5.22	6.26	1.71	24.77	0.18	0.22	0.06	0.87
Pollock	4	53.97	12.70	38.68	69.02	1.90	0.45	1.36	2.43
Porgy	116	73.84	74.94	4.39	421.37	2.60	2.64	0.15	14.86
Sole	18	51.84	61.34	1.68	186.60	1.83	2.16	0.60	6.58
Striped Bass	40	60.01	78.04	0.55	421.37	2.12	2.75	0.02	14.86
Swordfish	53	47.36	56.25	0.47	280.21	1.67	1.98	0.02	9.88
Tuna, canned	364	59.87	67.62	1.71	430.16	2.11	2.38	0.06	15.17
Tuna, fresh	37	82.87	75.86	5.88	282.77	2.92	2.67	0.21	9.97
Turbot	---	---	---	---	---	---	---	---	---
Whiting / Kingfish	---	---	---	---	---	---	---	---	---
Caviar	---	---	---	---	---	---	---	---	---
LM Bass	3	110.78	125.68	33.32	255.79	3.91	4.43	1.17	9.02
SM Bass	2	38.27	7.01	33.31	43.23	1.35	0.25	1.17	1.52
Bass, unspecified	11	62.89	26.36	27.06	93.33	2.22	0.93	0.95	3.29
Bullhead	---	---	---	---	---	---	---	---	---
Carp	4	68.38	17.58	42.37	79.35	2.41	0.62	1.49	2.80
Catfish	50	71.87	69.79	2.96	352.06	2.53	2.46	0.10	12.41
Eel	15	109.91	109.06	10.04	352.06	3.88	3.85	0.35	12.41
Northern Pike	---	---	---	---	---	---	---	---	---
White Perch	16	64.99	32.96	12.69	126.67	2.29	1.16	0.45	4.47
Yellow Perch	14	158.09	108.50	42.37	415.49	5.57	3.83	1.49	14.65
Perch, unspecified	---	---	---	---	---	---	---	---	---
Pickarel	---	---	---	---	---	---	---	---	---
Salmon	39	95.88	103.16	2.96	421.37	3.38	3.64	0.10	14.86
Sunfish, unspecified	1	75.35	---	75.35	75.35	2.66	---	2.66	2.66
Tilapia	4	123.65	158.91	10.04	352.06	4.36	5.60	0.35	12.41
Trout, unspecified	44	56.41	54.80	2.40	352.06	1.99	1.93	0.08	12.41
Whitefish	24	72.52	73.47	7.65	280.21	2.56	2.59	0.27	9.88
Walleye	---	---	---	---	---	---	---	---	---
Clams	224	75.36	76.45	2.96	415.49	2.66	2.70	0.10	14.65
Blue crab	122	81.58	83.99	1.57	430.16	2.88	2.96	0.06	15.17
Lobster	321	63.28	61.85	0.34	352.06	2.23	2.18	0.01	12.41
Mussels	36	78.24	78.39	0.57	352.06	2.76	2.76	0.02	12.41
Oysters	93	64.19	70.34	2.40	415.49	2.26	2.48	0.08	14.65
Scallops	66	64.41	60.65	11.37	352.06	2.27	2.14	0.40	12.41
Shrimp	312	64.71	74.84	0.74	430.16	2.28	2.64	0.03	15.17
Squid	103	63.55	49.52	4.69	352.06	2.24	1.75	0.17	12.41
Total Fish / Seafood	532	44.79	61.49	0	430.01	1.58	2.17	0	15.17

G. Limited Income Families

Species	No. of consumers	Mean Total grams/day	Standard Deviation	Minimum	Maximum	Mean Total ounces/day	Standard Deviation	Minimum	Maximum
Blackfish	57	114.69	102.30	2.06	479.53	4.04	3.61	0.72	16.91
Bluefish	123	81.45	80.83	2.06	430.16	2.87	2.85	0.07	15.17
Butterfish	62	63.89	54.29	9.30	244.64	2.25	1.91	0.33	8.63
Cod	81	49.73	75.57	4.61	572.08	1.75	2.66	0.16	20.17
Fish Sticks	242	52.86	63.45	1.59	430.16	1.86	2.24	0.06	15.17
Flounder / Fluke	155	71.27	68.51	2.07	479.53	2.51	2.42	0.07	16.91
Haddock	36	56.76	98.67	3.35	572.08	2.00	3.48	0.12	20.17
Halibut	16	8.68	11.37	1.71	41.62	0.31	0.40	0.06	1.47
Pollock	1	158.10	---	158.10	158.10	5.57	---	5.57	5.57
Porgy	129	80.31	64.53	2.06	421.37	2.83	2.28	0.07	14.86
Sole	18	53.00	53.14	1.68	170.25	1.87	1.87	0.06	6.00
Striped Bass	61	86.56	91.34	0.55	479.53	3.05	3.22	0.02	16.91
Swordfish	59	38.94	39.84	0.47	226.23	1.37	1.40	0.02	7.98
Tuna, canned	687	51.76	67.55	0.41	572.08	1.83	2.38	0.01	20.17
Tuna, fresh	109	58.94	50.76	2.61	302.90	2.08	1.79	0.09	10.68
Turbot	---	---	---	---	---	---	---	---	---
Whiting / Kingfish	16	97.21	77.84	18.79	209.52	3.43	2.74	0.66	7.39
Caviar	2	34.11	42.01	4.40	63.81	1.20	1.48	0.16	2.25
LM Bass	5	283.55	249.54	24.03	572.08	10.00	8.80	0.85	20.17
SM Bass	14	56.00	31.80	11.52	111.16	1.97	1.12	0.41	3.92
Bass, unspecified	10	52.55	26.13	8.50	79.02	1.85	0.92	0.30	2.79
Bullhead	---	---	---	---	---	---	---	---	---
Carp	24	73.06	48.11	18.58	207.92	2.58	1.70	0.66	7.33
Catfish	78	76.34	71.12	2.06	479.53	2.69	2.51	0.07	16.91
Eel	8	139.64	154.54	2.06	479.53	4.92	5.45	0.07	16.91
Northern Pike	16	62.50	30.56	20.40	95.00	2.20	1.08	0.72	3.35
White Perch	29	78.33	41.93	26.72	207.92	2.76	1.48	0.94	7.33
Yellow Perch	14	158.09	108.50	42.37	415.49	5.57	3.83	1.49	14.65
Perch, unspecified	12	91.08	146.72	1.36	479.53	3.21	5.17	0.05	16.91
Pickrel	1	479.53	---	479.53	479.53	16.91	---	16.91	16.91
Salmon	51	56.11	69.45	2.96	421.37	1.98	2.45	0.10	14.86
Sunfish, unspecified	83	63.26	71.56	1.91	479.53	2.23	2.52	0.07	16.91
Tilapia	3	22.19	16.82	12.48	41.62	0.78	0.59	0.44	1.47
Trout, unspecified	113	60.23	61.88	2.61	479.53	2.12	2.18	0.09	16.91
Whitefish	32	58.94	40.41	2.56	135.39	2.08	1.42	0.09	4.77
Walleye	---	---	---	---	---	---	---	---	---
Clams	444	70.96	78.63	0.46	572.08	2.50	2.77	0.02	20.17
Blue crab	223	74.87	70.80	1.85	479.53	2.64	2.50	0.07	16.91
Lobster	420	62.36	63.02	0.34	572.08	2.20	2.22	0.01	20.17
Mussels	67	80.73	76.06	0.57	364.10	2.85	2.68	0.02	12.84
Oysters	81	59.64	66.25	2.06	415.49	2.10	2.34	0.07	14.65
Scallops	1,661	50.36	46.81	4.43	209.52	1.78	1.65	0.16	7.39
Shrimp	741	59.86	67.09	0.15	572.08	2.11	2.37	0.01	20.17
Squid	144	80.37	74.62	2.06	364.10	2.83	2.63	0.07	12.84
Total Fish / Seafood	937	43.13	60.37	0	571.88	1.52	2.13	0	20.17

H. Women, >15 and ≤45

Species	No. of consumers	Mean Total grams/day	Standard Deviation	Minimum	Maximum	Mean Total ounces/day	Standard Deviation	Minimum	Maximum
Blackfish	35	96.19	98.54	8.78	366.43	3.39	3.47	0.31	12.92
Bluefish	79	76.05	76.34	3.33	366.43	2.68	2.69	0.12	12.92
Butterfish	30	94.45	88.19	16.10	352.06	3.33	3.11	0.57	12.41
Cod	59	45.84	50.61	2.98	208.05	1.62	1.78	0.10	7.34
Fish Sticks	153	53.09	62.96	1.85	366.43	1.87	2.22	0.07	12.92
Flounder / Fluke	124	66.54	67.68	3.33	494.98	2.35	2.39	0.12	17.45
Haddock	27	48.03	51.84	4.72	208.05	1.69	1.83	0.17	7.34
Halibut	11	20.30	20.95	1.75	57.79	0.72	0.74	0.06	2.04
Pollock	8	25.85	17.08	8.09	57.50	0.91	0.60	0.29	2.03
Porgy	73	86.81	59.47	10.22	352.06	3.06	2.10	0.36	12.41
Sole	32	41.14	42.64	6.82	186.60	1.45	1.50	0.24	6.58
Striped Bass	53	48.47	49.63	1.91	208.05	1.71	1.75	0.07	7.34
Swordfish	74	45.05	39.83	1.65	226.23	1.59	1.40	0.06	7.98
Tuna, canned	384	50.59	61.27	0.47	494.98	1.78	2.16	0.02	17.45
Tuna, fresh	88	50.02	41.90	2.06	282.77	1.76	1.48	0.07	9.97
Turbot	1	18.65	---	18.65	18.65	0.66	---	0.66	0.66
Whiting / Kingfish	6	100.09	85.16	35.37	209.52	3.53	3.00	1.25	7.39
Caviar	1	32.89	---	32.89	32.89	1.16	---	1.16	1.16
LM Bass	2	31.63	10.74	24.03	39.22	1.12	0.38	0.85	1.38
SM Bass	7	53.46	25.61	24.03	93.30	1.89	0.90	0.85	3.29
Bass, unspecified	8	73.79	21.98	45.14	119.24	2.60	0.78	1.59	4.20
Bullhead	---	---	---	---	---	---	---	---	---
Carp	13	86.86	64.08	28.37	198.99	3.06	2.26	1.00	7.02
Catfish	70	83.02	61.80	10.51	352.06	2.93	2.18	0.37	12.41
Eel	8	130.73	107.25	13.73	352.06	4.61	3.78	0.48	12.41
Northern Pike	8	92.47	37.87	24.65	158.09	3.26	1.34	0.87	5.57
White Perch	20	66.78	40.10	22.93	198.99	2.35	1.41	0.81	7.02
Yellow Perch	6	137.68	122.92	42.37	366.43	4.85	4.33	1.49	12.92
Perch, unspecified	7	32.05	28.04	7.00	82.66	1.13	0.99	0.25	2.91
Pickrel	1	75.99	---	75.99	75.99	2.68	---	2.68	2.68
Salmon	50	49.67	62.18	0.71	352.06	1.75	2.19	0.03	12.41
Sunfish, unspecified	30	62.37	49.59	1.91	196.27	2.20	1.75	0.07	6.92
Tilapia	2	189.91	229.32	27.76	352.06	6.69	8.09	0.98	12.41
Trout, unspecified	80	55.86	57.68	0.71	352.06	1.97	2.03	0.03	12.41
Whitefish	20	88.79	53.98	16.10	196.27	3.13	1.90	0.57	6.92
Walleye	1	30.47	---	30.47	30.47	1.07	---	1.07	1.07
Clams	367	57.16	65.52	0.26	494.98	2.02	2.31	0.01	17.45
Blue crab	153	72.14	65.05	2.61	352.06	2.54	2.29	0.09	12.41
Lobster	359	54.72	62.22	0.34	494.98	1.93	2.19	0.01	17.45
Mussels	62	72.85	75.43	0.57	364.10	2.57	2.66	0.02	12.84
Oysters	68	55.34	52.31	3.33	226.23	1.95	1.84	0.12	7.98
Scallops	131	52.23	62.67	3.33	494.98	1.84	2.21	0.12	17.45
Shrimp	430	57.37	59.93	0.74	494.98	2.02	2.11	0.03	17.45
Squid	105	72.88	70.77	6.15	364.10	2.57	2.50	0.22	12.84
Total Fish / Seafood	497	46.53	57.44	0	494.80	1.64	2.03	0	17.45

I. Children ≤15

Species	No. of consumers	Mean Total grams/day	Standard Deviation	Minimum	Maximum	Mean Total ounces/day	Standard Deviation	Minimum	Maximum
Blackfish	21	36.07	34.19	2.40	114.95	1.27	1.21	0.08	4.05
Bluefish	51	31.76	29.01	0.77	114.95	1.12	1.02	0.03	4.05
Butterfish	22	37.20	31.64	1.90	101.56	1.31	1.11	0.07	3.58
Cod	54	27.70	47.31	2.94	304.74	0.98	1.67	0.10	10.75
Fish Sticks	176	24.13	26.56	0.63	154.64	0.85	0.94	0.02	5.45
Flounder / Fluke	85	26.74	24.33	0.77	95.30	0.94	0.86	0.03	3.36
Haddock	25	40.05	67.31	3.18	304.74	1.41	2.37	0.11	10.75
Halibut	8	6.14	7.94	1.71	24.77	0.22	0.28	0.06	0.87
Pollock	6	18.64	9.78	5.52	29.38	0.66	0.34	0.19	1.04
Porgy	52	43.35	51.19	4.39	304.74	1.53	1.80	0.15	10.75
Sole	20	25.67	40.87	1.68	142.71	0.91	1.44	0.06	5.03
Striped Bass	35	38.08	29.46	3.57	95.30	1.34	1.04	0.13	3.36
Swordfish	39	22.67	17.58	0.47	93.72	0.80	0.62	0.02	3.30
Tuna, canned	334	27.46	29.88	0.41	304.74	0.97	1.05	0.01	10.75
Tuna, fresh	35	28.38	19.12	5.10	93.72	1.00	0.67	0.18	3.30
Turbot	---	---	---	---	---	---	---	---	---
Whiting / Kingfish	4	24.04	9.28	18.79	37.92	0.85	0.33	0.66	1.34
Caviar	2	11.68	10.29	4.40	18.96	0.41	0.36	0.16	0.67
LM Bass	---	---	---	---	---	---	---	---	---
SM Bass	4	16.15	10.08	5.52	28.98	0.57	0.36	0.19	1.02
Bass, unspecified	9	34.30	31.13	7.05	75.99	1.21	1.10	0.25	2.68
Bullhead	---	---	---	---	---	---	---	---	---
Carp	5	33.62	30.96	1.90	84.28	1.19	1.09	0.07	2.97
Catfish	30	27.30	22.00	2.96	84.28	0.96	0.78	0.10	2.97
Eel	3	37.16	33.05	10.04	73.97	1.31	1.17	0.35	2.61
Northern Pike	1	75.99	---	75.99	75.99	2.68	---	2.68	2.68
White Perch	7	65.60	25.30	12.69	89.28	2.31	0.89	0.45	3.15
Yellow Perch	4	100.66	18.54	75.99	114.95	3.55	0.65	2.68	4.05
Perch, unspecified	4	18.57	11.57	4.21	32.56	0.65	0.41	0.15	1.15
Pickrel	1	75.99	---	75.99	75.99	2.68	---	2.68	2.68
Salmon	25	23.14	59.38	0.31	304.74	0.82	2.09	0.01	10.75
Sunfish, unspecified	10	22.68	17.43	5.71	53.31	0.80	0.61	0.20	1.88
Tilapia	5	16.19	3.95	10.04	21.07	0.57	0.14	0.35	0.74
Trout, unspecified	46	26.22	27.64	0.77	95.30	0.92	0.97	0.03	3.36
Whitefish	17	32.07	28.46	2.56	101.56	1.13	1.00	0.09	3.58
Walleye	---	---	---	---	---	---	---	---	---
Clams	172	37.38	38.81	0.69	304.74	1.32	1.37	0.02	10.75
Blue crab	85	40.45	48.87	1.85	304.74	1.43	1.72	0.07	10.75
Lobster	187	33.51	34.37	0.57	304.74	1.18	1.21	0.02	10.75
Mussels	21	33.73	23.44	0.57	83.87	1.19	0.83	0.02	2.96
Oysters	29	24.62	18.00	2.40	66.02	0.87	0.63	0.08	2.33
Scallops	66	28.23	25.28	3.57	96.60	1.00	0.89	0.13	3.41
Shrimp	300	29.47	35.58	0.13	324.96	1.04	1.25	0.00	11.46
Squid	45	38.37	25.06	2.56	93.72	1.35	0.88	0.09	3.30
Total Fish / Seafood	559	18.28	29.85	0	324.85	0.64	1.05	0	11.46

Appendix 19A-J. Water bodies fished by population and non-commercial species. Responses are number of people indicating fishing for species at location. Sport fishing category encompasses all non-commercial fishing activity. The limited income and minority populations are subsets of the sport fishing population, while the Southeast Asian and non-Southeast Asians are subsets of the minority population.

Freshwater

A. Largemouth and Small-mouth Bass	Sport Fishing	Limited Income	Minority	SE Asians	Non-SE Asian
Aspectuck Reservoir	2	2	---	---	---
Aspetuck River	1	2	---	---	---
Bantam Lake	3	2	---	---	---
Candlewood Lake	6	6	4	4	---
Cedar Lake	1	---	---	---	---
Congamond Lake	1	---	2	---	4
Connecticut River	6	7	6	6	---
Connecticut Ponds, Lakes, Rivers	12	2	2	---	2
Devil's Hopyard	1	---	---	---	---
Farmington River	4	1	1	---	1
Higganum Reservoir	1	---	---	---	---
Highland Lake	2	2	---	---	---
Hollister Road Pond	1	1	---	---	---
Horse Pond	1	1	---	---	---
Housatonic River	1	---	---	---	---
Killingly Pond	5	---	---	---	---
Lake Dibbs	1	---	1	---	1
Lake Lillinonah	1	---	---	---	---
Lake Saltonstall	2	---	---	---	---
Mill River, Hamden	1	---	---	---	---
Moosup Pond	2	2	---	---	---
Mount Hope River	2	---	---	---	---
Naugatuck River	1	---	---	---	---
Plymouth Lake	1	---	---	---	---
Quinebaug River	5	---	---	---	---
Rogers Lake	1	---	---	---	---
Saugatuck Reservoir	2	---	---	---	---

B. Catfish	Sport Fishing	Limited Income	Minority	SE Asians	Non-SE Asians
Black Pond, Meriden	1	1	---	---	---
Cedar Lake	1	---	---	---	---
Connecticut Ponds, Lakes, Rivers	5	6	6	6	---
Connecticut River	25	18	36	35	1
Farmington River	2	---	2	---	2
Green Fall Pond	1	---	---	---	---
Housatonic River	6	---	6	6	---
Hunts Brook	1	1	---	---	---
Lake Saltonstall	1	---	---	---	---
Lake Winchester	1	---	---	---	---
Moosup Pond	2	---	---	---	---

C. White and Yellow Perch	Sport Fishing	Limited Income	Minority	Non-SE Asian
Bantam Lake	2	---	---	---
Candlewood Lake	4	2	---	---
Cedar Lake	1	---	---	---
Chamberlain Pond	1	---	1	1
Connecticut Ponds, Lakes, Rivers	4	3	3	---
Connecticut River	15	20	24	1
Eight Mile River	2	---	---	---
Farmington River	5	---	---	---
Gorton Pond	1	---	---	---
Hayward Lake	2	---	---	---
Housatonic River	5	---	---	---
Lake Lillinonah	1	---	---	---
Lake Saltonstall	1	---	---	---
Long Pond	1	---	---	---
Mudge Pond	2	---	---	---
Patchaug River	1	---	---	---
Plymouth Lake	1	---	---	---
Powers Lake	1	1	---	---
Quassapaug Lake	2	---	---	---
Saugatuck Reservoir	1	---	---	---
Twin Lakes	4	---	---	---
Westside Pond	2	---	---	---

D. Bullhead	Sport Fishing
Ay-A-Po Pond	2
Connecticut Ponds, Lakes, Rivers	2
Cedar Lake	1
Gardner Lake	1
Glasgo Pond	1
Patchaug Pond	1

E. Trout	Sport Fishing	Limited Income	Minority	SE Asians	Non-SE Asians
Amos Lake	1	---	---	---	---
Ball Pond	1	---	---	---	---
Bantam Lake	7	8	6	6	---
Blackledge River	3	---	---	---	---
Blackwells Brook	1	---	---	---	---
Candlewood Lake	11	---	5	5	---
Cedar Lake	3	---	---	---	---
Connecticut Ponds, Lakes, Rivers	18	5	6	5	1
Connecticut River	24	32	41	38	3
Connecticut Southwest Streams	1	---	---	---	---
Crystal Lake	1	---	---	---	---
Devil's Hopyard	1	---	---	---	---
Eight Mile River	3	---	---	---	---
Far Mill River	1	---	---	---	---
Farmington River	20	4	5	3	2
Furnace Brook	1	---	---	---	---
Gardner Lake	1	---	---	---	---
Hammonasset River	1	---	---	---	---
Higganum Reservoir	1	---	---	---	---
Highland Lake	2	2	---	---	---
Housatonic River	8	---	2	2	---
Lake Dibbs	1	---	1	---	1
Lake Lillinonah	1	---	---	---	---
Lake Saltonstall	2	---	---	---	---
Lake Zoar	2	---	---	---	---
Latimer Brook	1	1	---	---	---
Long Pond	1	---	---	---	---
Mill River, Hamden	3	---	---	---	---
Moosup Pond	1	2	---	---	---
Mount Tom Pond	1	1	---	---	---
Natchaug River	1	---	---	---	---
Naugatuck River	2	---	4	4	---
Patchaug River	1	---	---	---	---
Pequonock River	1	---	---	---	---
Quinebaug River	2	---	---	---	---
Quonnipaug River	1	---	---	---	---
Rogers Lake	2	---	---	---	---
Salmon Brook	1	---	---	---	---
Salmon River	10	2	---	---	---
Saugatuck Reservoir	5	---	---	---	---
Saugatuck River	1	---	---	---	---
Scantic River	3	1	---	---	---
Stony Brook	1	---	---	---	---
Thames River	1	2	---	---	---
Twin Lakes	4	---	---	---	---
Westhill Pond	1	---	---	---	---
Westside Pond	2	---	---	---	---

Saltwater Fish

F. Striped Bass	Sport Fishing	Limited Income	Minority	SE Asians	Non-SE Asians
Bartlett's Reef	---	2	---	---	---
Block Island Sound	2	---	---	---	---
Connecticut Coastline	2	2	2	---	2
Connecticut River, mouth	13	---	5	1	4
Cornfield Point	1	---	---	---	---
Fisher's Island Sound	1	---	2	---	2
Guilford Sound	1	---	---	---	---
Housatonic River, Derby Dam	4	---	6	---	6
Housatonic River, mouth	1	---	---	---	---
Long Island Sound	96	23	18	4	14
New Haven Harbor	4	---	---	---	---
Niantic River Bay	13	5	---	---	---
Ocean Beach	7	4	8	4	4
Plum Island	1	---	---	---	---
Race	7	2	---	---	---
Rhode Island Coast	3	1	---	---	---
Rocky Neck State Park	---	1	1	1	---
Salmon River	1	---	---	---	---
Thames River, mouth	12	---	---	---	---
Watch Hill	5	---	---	---	---

G. Bluefish	Sport Fishing	Limited Income	Comm. Fishing	Minority	SE Asians	Non-SE Asians
Atlantic Ocean, canyons	---	---	1	1	---	1
Barn Island	---	---	1	---	---	---
Black Point	1	---	---	---	---	---
Block Island Sound	---	---	2	---	---	---
Branford Reef	---	---	1	---	---	---
Clinton Tide Rips	---	---	1	---	---	---
Connecticut River, mouth	5	6	1	6	---	6
Cornfield Point	---	---	---	---	---	---
Fisher's Island Sound	2	---	1	---	---	---
Guilford Sound	1	---	---	---	---	---
Harkness State Park	1	2	2	2	---	2
Housatonic River, mouth	2	---	3	---	---	---
Long Island Sound	95	32	33	26	9	17
Montauk	3	---	---	---	---	---
New Haven Harbor	3	---	1	---	---	---
Niantic River Bay	7	4	5	---	---	---
Norwalk Islands	1	---	2	---	---	---
Ocean Beach	9	16	---	16	16	---
Plum Island	2	---	---	---	---	---
Point No Point	1	---	---	---	---	---
Race	10	2	9	---	---	---
Rhode Island Coast	8	6	2	10	6	4
Seaside Park	3	4	---	7	7	---
South Benson Marina	1	---	---	---	---	---
Southwest Reef	---	---	1	---	---	---
Stonington Harbor	2	---	---	---	---	---
Thames River, mouth	2	---	1	---	---	---
Watch Hill	1	---	4	1	---	1

H. Blackfish	Sport Fishing	Limited Income	Comm. Fishing	Minority	SE Asians	Non-SE Asians
Atlantic Ocean,						
Canyons	---	---	2	---	---	---
Barn Island	---	---	2	---	---	---
Bartlett's Reef	---	4	4	---	---	---
Connecticut River,						
mouth	---	5	1	5	---	5
Duck Island	2	---	---	---	---	---
Fishers Island Sound	1	---	6	1	---	1
Giants Neck Beach	---	---	4	---	---	---
Guilford Sound	2	---	---	---	---	---
Hammonasset State						
Park	1	---	---	---	---	---
Harkness State Park	1	---	---	---	---	---
Housatonic River,						
mouth	1	---	---	---	---	---
Long Island Sound	69	16	45	12	---	12
New Haven Harbor	7	1	2	---	---	---
Niantic River Bay	6	4	8	---	---	---
Norwalk Islands	---	---	3	---	---	---
Ocean Beach	2	12	---	12	12	---
Plum Gut, Southview	2	---	---	---	---	---
Race	4	1	---	---	---	---
Rhode Island Coast	2	---	2	2	---	2
Seaside Park	3	8	---	8	8	---
Sherwood Island State						
Park	1	---	---	---	---	---
Six Mile Reef	1	1	---	---	---	---
South Benson Marina	1	---	---	---	---	---
Thimble Islands	---	---	1	---	---	---
Watch Hill	---	---	1	---	---	---
West Haven breakwall	1	---	---	---	---	---

I. Porgy	Sport Fishing	Limited Income	Comm. Fishing	Minority	SE Asians	Non-SE Asians
Atlantic Ocean,						
Canyons	---	---	1	---	---	---
Bartlett's Reef	1	---	1	---	---	---
Duck Island	2	---	---	---	---	---
Falkner's Island	1	1	---	---	---	---
Fisher's Island Sound	1	---	2	2	---	2
Guilford Sound	2	---	---	---	---	---
Long Island Sound	36	14	10	22	---	22
New Haven Harbor	3	1	---	1	---	1
Niantic River Bay	5	5	8	1	---	1
Norwalk Islands	---	---	1	---	---	---
Pawcatuck River	---	---	1	---	---	---
Rhode Island Coast	1	1	---	1	1	---
Seaside Park	1	4	---	4	4	---
Stonington Harbor	1	---	---	---	---	---
Thames River, mouth	1	---	---	---	---	---

Appendix 20. Demographics of total population answering fish consumption advisory questions. Population includes those households returning incomplete food frequencies. Populations are not mutually exclusive.

Variable	General Population		Sport Fishing Families		Commercial Fishing Families		Minority Families		Limited Income Families		Women >15 and ≤ 45		Children ≤ 15	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n
No. of Households Surveyed		216		348		76		281		280		429		313
No. of Individuals Surveyed		460		514		190		901		949		507		570
Household Size		216		348		76		246		280		429		313
1 person	34.26	74	11.78	41	13.16	10	6.91	17	11.07	31	5.13	22	—	—
2 people	37.96	82	26.72	93	50.00	38	14.23	35	16.79	47	18.88	81	8.31	26
3 people	13.89	30	20.69	72	17.11	13	28.86	71	23.57	66	27.97	120	30.67	96
4 people	9.26	20	25.00	87	14.47	11	28.05	69	24.29	68	27.27	117	34.82	109
5 people	4.17	9	10.06	35	3.95	3	10.57	26	12.14	34	12.82	55	16.29	51
6–9 people	0.46	1	5.75	20	1.32	1	11.39	28	12.14	34	7.93	34	8.62	27
County of Residence		216		346		76		281		279		428		308
Fairfield	21.30	46	23.70	82	13.16	10	21.00	59	16.49	46	17.29	74	17.53	54
Hartford	26.39	57	21.68	75	17.11	13	50.18	141	41.58	116	37.62	161	34.74	107
Litchfield	7.87	17	5.49	19	—	—	0.71	2	9.68	27	8.88	38	11.36	35
Middlesex	7.41	16	7.23	25	15.79	12	1.07	3	1.79	5	3.97	17	3.57	11
New Haven	24.07	52	24.86	86	18.42	14	19.57	55	19.35	54	22.66	97	21.75	67
New London	8.33	18	5.20	18	34.21	26	0.71	2	2.51	7	3.97	17	4.55	14
Tolland	1.39	3	1.73	6	—	—	1.42	4	0.72	2	1.87	8	2.27	7
Windham	3.24	7	2.60	9	1.32	1	0.71	2	6.81	19	3.27	14	3.25	10
Race (Household)		216		347		189		281		279		429		313
White, non-Hispanic	91.20	197	75.22	261	98.41	186	—	—	50.18	140	52.68	226	53.99	169
Black, non-Hispanic	1.39	3	4.03	14	—	—	28.83	81	13.98	39	12.82	55	15.02	47
Chinese	1.39	3	0.58	2	—	—	3.20	9	0.72	2	1.63	7	1.92	6
Korean	0.46	1	0.29	1	—	—	5.69	16	1.79	5	1.86	8	1.60	5
Hmong	—	—	0.29	1	—	—	1.42	4	0.36	1	0.93	4	0.32	1
Filipino	0.46	1	0.58	2	1.59	3	2.14	6	—	—	1.17	5	0.32	1
Asian Indian	0.93	2	—	—	—	—	1.07	3	0.72	1	—	—	0.32	1
Vietnamese	0.46	1	8.07	28	—	—	25.98	73	16.13	45	12.82	55	7.99	25
Cambodian	—	—	1.15	4	—	—	1.78	5	0.72	2	0.93	4	0.96	3
Laotian	—	—	0.58	2	—	—	2.85	8	1.08	3	1.40	6	1.28	4
Mexican	—	—	0.58	2	—	—	0.71	2	0.72	2	0.47	2	0.64	2
Puerto Rican	1.85	4	2.88	10	—	—	12.45	35	7.89	22	7.69	33	9.90	31
Central American	—	—	0.58	2	—	—	1.78	5	1.43	4	0.93	4	1.28	4
Dominican	—	—	0.29	1	—	—	1.07	3	0.36	1	0.70	3	0.64	2
Hispanic	0.46	1	1.15	4	—	—	8.90	25	2.51	7	2.33	10	2.56	8
South American	0.93	2	0.86	3	—	—	2.14	6	1.43	4	1.40	6	0.96	3

Appendix 20 continued.

Variable	General Population		Sport Fishing Families		Commercial Fishing Families		Minority Families		Limited Income Families		Women >15 and ≤ 45		Children ≤ 15	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Primary Language (Household)		215		345		74		278		275		426		309
English	95.35	205	80.58	278	97.30	72	31.65	88	65.09	179	69.48	296	72.49	224
Spanish	1.87	4	4.93	17	---	---	16.19	45	12.00	33	9.85	42	11.00	34
Chinese	0.93	2	0.29	1	---	---	2.16	6	0.36	1	0.94	4	1.29	4
Vietnamese	0.47	1	8.12	28	---	---	26.26	73	16.36	45	12.91	55	8.41	26
Korean	---	---	0.29	1	---	---	5.40	15	1.82	5	1.64	7	1.62	5
Cambodian	---	---	1.16	4	---	---	1.80	5	0.73	2	0.94	4	0.97	3
Hmong	---	---	0.29	1	---	---	1.44	4	0.36	1	0.94	4	0.32	1
Laotian	---	---	0.58	2	---	---	2.88	8	1.09	3	1.41	6	1.29	4
Other	1.40	3	2.03	7	2.70	2	0.72	2	2.18	6	1.88	8	2.58	8
Household Education		216		347		76		280		278		427		312
Kindergarten – Eighth	---	---	2.59	9	---	---	6.78	19	5.76	16	4.21	18	2.88	9
Some High School	4.17	9	11.82	41	9.21	7	24.64	69	24.48	68	15.93	68	15.38	48
High School or GE Degree	20.83	45	30.84	107	21.05	16	18.93	53	38.85	108	28.57	122	35.26	110
Some College	17.13	37	23.05	80	25.00	19	22.14	62	21.58	60	22.72	97	21.79	68
2 / 4 Year College Degree	27.78	60	20.46	71	21.05	16	10.71	30	6.47	18	17.80	76	14.74	46
Postgraduate Degree	30.09	65	9.22	32	22.37	17	4.64	13	1.80	5	9.84	42	9.29	26
Household Income		216		347		74		280		276		427		312
\$0 – 4,999	0.93	2	3.17	11	---	---	8.21	23	12.32	34	7.49	32	7.05	22
\$5,000 – 9,999	1.85	4	6.63	23	---	---	13.21	37	25.36	70	11.94	51	12.18	38
\$10,000 – 14,999	5.09	11	6.05	21	1.35	1	6.07	17	19.20	53	7.96	34	10.26	32
\$15,000 – 19,999	6.02	13	5.48	19	4.05	3	10.36	29	18.84	52	10.07	43	11.86	37
\$20,000 – 24,999	4.17	9	5.48	19	1.35	1	11.07	31	6.52	18	9.37	40	11.54	36
\$25,000 – 29,999	6.94	15	6.05	21	5.41	4	7.50	21	3.26	9	5.39	23	5.77	18
\$30,000 – 39,999	9.72	21	8.36	29	12.16	9	7.86	22	3.26	9	9.84	42	10.58	33
\$40,000 – 49,999	17.13	37	13.83	48	13.51	10	7.50	21	1.09	3	10.07	43	4.17	13
\$50,000 – 59,999	8.33	18	8.93	31	10.81	8	1.43	4	---	---	4.45	19	3.85	12
\$60,000 – 69,999	11.11	24	4.61	16	12.16	9	1.43	4	---	---	4.68	20	2.88	9
≥ \$70,000	23.15	50	16.14	56	35.14	26	3.57	10	---	---	10.54	45	9.94	31
Food Stamps		215		345		74		278		275		426		309
Yes	0.47	1	9.28	32	---	---	22.66	63	35.27	97	22.07	94	24.92	77
No	99.53	214	87.25	301	100.00	74	63.67	177	63.27	174	77.23	329	74.76	231

Appendix 21. Individual demographic information for members of all households answering the fish consumption advisory questions. Populations are not mutually exclusive.

Variable	General Population		Sport Fishing Families		Commercial Fishing Families		Minority Families		Limited Income Families		Women >15 and ≤ 45		Children ≤ 15	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n
No. of Households Surveyed		216		348		76		281		280		429		313
No. of Individuals Surveyed		460		514		190		901		949		507		570
Gender		460		514		189		901		949		507		570
Male	47.83	22	72.57	373	55.03	104	47.50	428	44.26	420	---	---	53.16	303
Female	52.17	240	26.85	138	44.97	85	52.39	472	55.43	526	100.00	507	46.84	267
Age Categories		453		506		188		858		936		503		570
Children ≤ 15	19.43	88	13.24	67	14.36	27	32.05	275	38.68	362	---	---	100.00	570
Females, > 15 and ≤ 45	21.41	97	17.00	86	15.96	30	28.55	245	27.99	262	99.80	502	---	---
Females, >45 and ≤ 65	12.58	57	4.15	21	17.55	33	8.16	70	5.77	54	0.20	1*	---	---
Males, >15 and ≤ 65	30.68	139	53.16	269	38.30	72	28.44	244	21.79	204	---	---	---	---
Adults > 65	15.87	72	12.45	63	13.83	26	2.80	24	5.77	54	---	---	---	---
No. of Pregnant Women	8.25	8	11.63	10	3.33	1	10.61	26	13.31	35	10.26	52	---	---
No. of Lactating Women	3.09	3	3.49	3	6.67	2	3.27	8	5.70	15	4.34	22	---	---
Eat fish / seafood		460		514		189		901		949		507		570
Yes	89.78	413	97.67	502	97.35	184	90.23	813	86.09	817	93.29	473	75.26	418
No	10.22	47	2.33	12	2.65	5	9.77	88	13.91	132	6.51	33	24.39	139
How Often Eat Seafood		409		502		183		776		817		475		427
1 – 6 meals / year	---	---	---	---	---	---	4.90	38	0.73	6	0.84	4	0.47	2
6 – 12 meals / year	19.07	78	16.93	85	7.10	13	0.52	4	8.45	69	12.63	60	9.84	42
1 – 2 meals / month	16.38	67	15.94	80	15.85	29	9.92	77	13.95	114	14.53	69	17.56	75
2 – 4 meals / month	7.09	29	5.38	27	7.10	13	3.99	31	6.24	51	6.32	30	6.56	28
1 – 2 meals / week	38.63	158	34.06	171	38.80	71	37.76	293	38.43	314	34.95	166	38.17	163
2 – 3 meals / week	11.49	47	15.34	77	18.03	33	28.48	221	19.34	158	19.37	92	16.63	71
3 – 5 meals / week	6.36	26	11.35	57	12.57	23	12.89	100	10.89	89	9.47	45	9.60	41
5 or more meals / week	0.98	4	0.60	3	0.55	1	1.68	13	1.96	16	1.47	7	1.17	5

* One woman counted in this age category because she was breastfeeding.