NOAA Technical Report NMFS 54 June 1987

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CONTENTS

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ABSTRACT

This report describes the proximate compositions (protein, moisture, fat, and ash) and major fatty acid profiles for raw and cooked samples of 40 southeastern finfish species. All samples (fillets) were cooked by a standard procedure in laminated plastic bags to an internal temperature of 70°C (158°F). Both summarized compositional data, with means and ranges for each species, and individual sample data including harvest dates and average lengths and weights are presented. When compared with raw samples, cooked samples exhibited an increase in protein content with an accompanying decrease in moisture content. Fat content either remained approximately the same or increased due to moisture loss during cooking. Our results are discussed in reference to compositional data previously published by others on some of the same species. Although additional data are needed to adequately describe the seasonal and geographic variations in the chemical compositions of many of these fish species, the results presented here should be useful to nutritionists, seafood marketers, and consumers.

INTRODUCTION

The need for thorough and reliable data on the proximate and fatty acid composition of food, especially fish, is expressed throughout the literature. These data are needed by nutritionists and food scientists to aid them in dietary formulations, nutrient labeling, processing, and product development (Exler et al. 1975; Kinsella et al. 1975, 1977). Sidwell (1981) summarized data from 1,204 publications and reported chemical and nutritional composition for approximately 1,500 species of finfish and shellfish; however, the fatty acid data reported by Sidwell were very limited, and the values were determined by gas-liquid chromatography (GLC) using packed columns that did not provide complete separations of the fatty acids. She noted that the range of values for particular constituents within a species is sometimes quite large. Part of this variation is probably due to both seasonal and biological differences as well as differences in analytical methods used by various researchers (Sidwell 1981).

The role that diet plays in the prevention of certain diseases continues to be a subject of major interest. Fish oils, with their preponderance of omega-3 (or n-3, which is the most recent convention in fatty acid shorthand notation), long chained fatty acids are linked with the prevention of coronary heart disease or CHD (Stansby 1984). Several studies have shown that the consumption of fish or fish oils reduces blood lipid levels in humans. Phillipson et al. (1985) found that a fish oil diet leads to decreases in both plasma cholesterol and triglyceride, as compared with a control diet without fish oils, in patients with elevated blood lipid levels. Fish oils, in addition to lowering lipid levels, may also act to reduce platelet aggregation, decrease blood viscosity, prevent ischemic damage, and, possibly, lower blood pressure (Stansby 1984; Harris 1985).

A thorough knowledge of the chemical components, particularly the lipids and fatty acids, is essential for the food scientist developing new fish products. The lipids in fish flesh are highly unsaturated and can oxidize very rapidly, producing compounds which may impart off-flavors and off-colors to the flesh (Kinsella et al. 1978). Lipases, which are also present in fish muscle, can release free fatty acids causing a reduction in the water-holding capacity of the protein, resulting in a tough, dry texture (Love 1966; Kinsella et al. 1978).

As part of a national program, the National Marine Fisheries Service (NMFS) Charleston Laboratory has determined the edibility characteristics and chemical compositions of southeast regional finfish species. The United States Army Natick Research and Development Laboratories, under an NMFS contract, developed a standard protocol for evaluating species edibility characteristics (flavor and texture), by applying both sensory and instrumental methods (Kapsalis and Maller 1980). For each of 40 fish species, at least three different seasonal samples were evaluated by a trained sensory panel. Instrumental texture and color measurements as well as proximate chemical compositions and fatty acid profiles were determined whenever possible on the same batch of fish. The edibility characteristics and instrumental measurements for the 40 southeastern finfish species were published elsewhere (Gooch and Hale 1986). This report presents data on the proximate and fatty acid compositions for both raw samples and samples which were cooked according to the standard procedure. In this report, however, summer flounder was deleted and Florida pompano was added.

METHODS

Sample preparation

The common and scientific names (American Fisheries Society 1980) of the 40 southeastern finfish species we examined are listed in Table 1. Only very fresh (unfrozen and stored on ice) fish that had been identified as to species were used in this study. Most of the finfish were purchased from Charleston seafood markets. Some species were landed locally while others were harvested off the North Carolina coast. Recreational fishermen provided several samples of great barracuda, dolphin, crevalle jack, king mackerel, and Spanish mackerel. The shark samples were obtained from research survey cruises by the South Carolina Wildlife and Marine Resources Department or from a local charterboat captain. Bleeding was accomplished by cutting off the tails. After bleeding, the sharks were butchered (fins, head, viscera, and belly flap removed), washed thoroughly with seawater, and placed either in a seawater-ice slush tank or directly in crushed ice (Low and Ulrich 1984).

Length and weight measurements were made on individual fish, and the mean reported. In several instances, i.e., some of the groupers and sharks, the sample consisted of a single large fish. Skinless fillets were prepared with the belly flaps, nape, and tail sections removed. The fillet portions to be cooked were placed in boil-in-bag pouches with drainage pockets and suspended in an agitated water bath at 71°C (159-160°F). Thermocouples were centered in several fillets and the fish were cooked to an internal temperature of 70°C (158°F). Random raw and cooked flesh samples were homogenized separately in a Robot Coupe food processor, placed in polypropylene sample cups, frozen and stored at −30°C until analyzed for proximate and fatty acid composition.

Proximate composition

Samples were analyzed for crude protein by the Kjeldahl method (Horowitz 1975). Moisture was determined on samples that were dried to constant weight in a forced air convection oven overnight at 100°C. Ash determinations were made on samples after heating overnight at 500°C. Fat was determined according to the Bligh and Dyer (1959) chloroform-methanol extraction method as modified by Smith et al. (1964). This modification employed a higher solvent:tissue ratio, designed for more complete lipid extraction. All samples were analyzed in duplicate.

Fatty acid composition

Lipids were extracted from the fish flesh in preparation for fatty acid determination using the Bligh and Dyer (1959) procedure. Trans-esterification of the fatty acids to their methyl esters was by a boron trifluoride-methanol procedure (Metcalfe and Schmitz 1961; Metcalfe et al. 1966). The esters were then spotted on silica gel-impregnated glass fiber sheets (Gelman Sciences, Inc., Ann Arbor, MI) and developed in a 90:10:1 solution of petroleum ether:diethyl ether:acetic acid. The purified esters fluoresced under UV light, which made it possible to locate and extract them from the adsorbent for analysis by capillary column GLC. Capillary columns yield better separations of individual fatty acids than packed GLC columns.

The fatty acid methyl esters (FAME) were separated on a Hewlett-Packard 5830 or 5840 gas chromatograph (Hewlett-Packard Co., Palo Alto, CA) equipped with a flame ionization detector (FID), using 50 m × 0.22 mm (i.d.) wall-coated open-tubular (capillary) flexible fused silica columns coated with Carbowax 20M (Hewlett-Packard Co.), CP Wax 52CB (Chrompack Inc., Bridgewater, NJ), or Silar 5-CP (Chrompack Inc.). These liquid phases all have similar McReynold's Constants. Operating conditions were as follows: column oven operated isothermally at ~190°C or temperature programmed from 180°-210°C at 1°/min (depending upon type and age of column); injection port temperature, 250°C; detector temperature, 270°C; helium carrier gas at 1 mL/min; nitrogen makeup gas at 30 mL/min. The gas chromatograph was equipped with a Hewlett-Packard 18850A microprocessor which reported retention time, peak area, and area percent for each component. These data were transferred directly to an Apple IIe microcomputer for disk storage and subsequent transferral to a Model 4 Radio Shack microcomputer via a commercial communications program (Videotex Plus, Tandy Corp., Ft. Worth, TX). Fatty acids were identified using a BASIC program which calculated equivalent chain length (ECL) values from their retention times (Jamieson 1970), compared the ECLS with those of authentic primary and secondary standards, and reported probable identities. These identifications and percentages were visually inspected and corrections made whenever necessary.

RESULTS AND DISCUSSION

Table 2 summarizes the proximate chemical compositions (protein, moisture, fat, and ash) in weight percent for the species evaluated. Mean values are given along with the range and number of samples analyzed. Protein content of the sharks was corrected for the non-protein moieties such as urea (Stansby and Hall 1967; Stansby 1976). Table 3 summarizes fatty acid profiles for the 40 fish species. Again, mean values are given along with the range and number of samples analyzed. Concentrations in weight percent are listed for 12 fatty acids. These particular fatty acids were selected from the 16 major ones shown in Tables 4 to 43 because they were generally present in greatest concentrations. Tables 4 to 43 list individual sampling dates, mean fork length, and weight measurements for the whole fish (unless otherwise indicated), proximate compositions (in weight percent), and weight percentages of 16 major fatty acids (17 in the striped mullet) for each evaluation. These 16 fatty acids were chosen either because they are usually present in significant amounts or they are of nutritional importance. Both raw and cooked sample results are listed. In instances where the fish were not obtained whole, a notation is given, e.g., gutted or H&G for headed and gutted.

The fatty acid shorthand notation used in all tables is the same as that adopted by Joseph (1985), wherein the "n" is a replacement for the "ω" (omega) notation. Thus 20:5ω3 and 20:5n3 both specify a fatty acid that has 20 carbons, 5 double bonds, and is a member of the omega-3 (or n-3) series of fatty acids (i.e., the first double bond is at the third position from the methyl end of the fatty acid chain).

Proximate composition

When compared with the raw samples of each species, the cooked samples exhibited an increase in protein content with a concomitant decrease in moisture content. Fat content of cooked samples either remained approximately the same or increased due to moisture loss (Dudek and Elkins 1986). The method of cooking can have a marked effect on fat content of the sample. Fat content can be either decreased by some methods or increased by others (Kinsella

et al. 1975). There is an inverse relationship between the lipid and moisture content of uncooked fish flesh, such that the sum of these two approximates 80% (Stansby 1962). This inverse relationship is elucidated by the Pearson Correlation Coefficient obtained for lipid vs. moisture content of the 40 species we examined. The coefficient was −0.82.

We found the largest variations in fat content between seasonal samples in the following fish species: striped mullet, crevalle jack, American shad, Spanish mackerel, ladyfish, southern kingfish (whiting), speckled hind, and bluefish. Most of these are considered high fat fish (with the exception of the speckled hind and the southern kingfish) that normally exhibit wide variations in fat content. The variation in the southern kingfish was probably also due to season of catch. The speckled hind samples varied widely in size; this is the probable reason for their variation in lipid content. Fat content varies not only from species to species, but also from individual to individual and from batch to batch of the same species harvested under different conditions or seasons (Stansby and Hall 1967). There is also variation in lipid content from one part of the fish to another (the concentration of lipids is lower near the tail than near the head) and in the different types of tissue analyzed, e.g., light muscle, dark muscle, or depot fat (Stansby 1962). The fish's environment (especially water temperature), size, age, and sex affect fat content as well (Stansby and Hall 1967; Stansby 1976). Perhaps the ultimate cause of variation is due to feed intake and related factors such as metabolism efficiency of the individual fish and the amount of energy required for active movement (Stansby 1962).

Our findings were comparable with previous proximate data reported by Webb et al. (1976), Sidwell (1981), Waters (1982), Anthony et al. (1983), and Mustafa and Medeiros (1985) for black sea bass, bluefish, channel catfish, Atlantic croaker, and spot. Spanish mackerel samples exhibited a large variation in the fat content, and the range we obtained was slightly lower than that reported by Sidwell (1981) and Gall et al. (1983).

Overall, striped mullet showed the largest variation in fat content. Data reported by Gruger et al. (1964), Deng et al. (1976), Exler and Weihrauch (1976), Viswanathan Nair and Gopakumar (1978), Finne et al. (1980), Sidwell (1981), and Vlieg (1984) show vastly differing values for the fat content in different seasonal samples of striped mullet. These data appear to be dependent not only upon the season and geographic location of the catch, but also upon the sexual maturity of the fish. Our range of values for fat content of American shad, red snapper, and weakfish was comparable to those published by Exler and Weihrauch (1976), Gordon and Roberts (1977), Kapsalis and Maller (1980), Gall et al. (1983), and Waters (1983).

For the 40 finfish species, in terms of mean values, fish with the lowest raw protein content were the goosefish, channel catfish, and Atlantic croaker. The Atlantic sharpnose shark and the scalloped hammerhead shark had the highest raw protein content. Sandbar shark, scalloped hammerhead shark, tiger shark, lemon shark, goosefish, and southern flounder exhibited the lowest raw fat content. American shad, spot, and striped mullet had the highest mean values for raw fat content.

Fatty acid composition

The fat of fish occurs primarily as triglycerides and phospholipids. It is generally believed that the component fatty acids of phospholipids are somewhat more polyunsaturated than those of triglycerides (Stansby 1973). Depot fats generally consist largely of triglycerides, while the total lipids of muscle tissues can contain large proportions of phospholipids (Gruger 1967). Almost all fish, crustaceans, and molluscs contain phospholipids at a level of approximately 0.7% (wet weight) to maintain cellular integrity (Ackman 1973).

The fatty acids derived from fish or other marine species differ markedly in the degree of unsaturation and molecular chain length from those of plant and land animal sources. Marine species contain substantial amounts of n-3 fatty acids that have 20 and 22 carbon atoms and 5 or 6 double bonds per molecule (Stansby and Hall 1967). Vegetable oils are high in polyunsaturates, but most of these are n-6 fatty acids containing only 2 double bonds. Terrestrial animal oils contain n-6 fatty acids with up to 5 double bonds, but are also high in saturated fats (Gunstone and Norris 1983; Krzynowek 1985).

After compiling data on approximately 70 finfish species, Exler and Weihrauch (1976) noted some general trends concerning fatty acid composition. These are listed below:

(1) "Palmitic acid (16:0) is the most common saturated fatty acid;

(2) Among the monounsaturated fatty acids, 18:1 is usually present in larger quantities than 16:1, and some species have relatively large amounts of 20:1 and 22:1;

(3) Fish also contain several polyunsaturated fatty acids (18:4, 20:5, 22:5, and 22:6) not found in significant amounts in other foods;

(4) The relative amount of 20:5 plus 22:6 is generally high in all fish; and

(5) Polyunsaturated fatty acids are lower in those fish with higher amounts of monounsaturated fatty acids; the saturated fatty acids remain relatively constant." The Exler and Weihrauch (1976) data list several undefined isomers as one group (e.g., 22:1) and does not utilize the "n" notation.

We observed the same trends in our data.

Kapsalis and Maller (1980) analyzed fatty acids on several of the same species we analyzed, using packed column GLC which does not permit separation of several important fatty acids. Compared with their results, our data showed higher percentages of 22:6n3 and 16:0 for bluefish, goosefish, gag grouper, red porgy, tilefish, and weakfish. For American shad, they reported 10% 18:3 and/or 20:1 but no 20:1 and/or 22:1 present at all. Our American shad samples contained approximately 20% for each of the these monoenoic acids. It should be noted that the majority of 22:1 present in the shad were the 22:1n13 plus 22:1n11 isomers, not 22:1n9 (erucic acid). The trienes were present in trivial amounts. Several authors have stated that the Clupeidae (herring) family are distinguished by very high levels (up to 30%) of isomeric 20:1 and 22:1 fatty acids (Lambertsen and Braekkan 1965; Ackman and Eaton 1966; Ackman 1973), the major isomers of each chain length are 20:1n9 and 22:1n13 plus 22:1n11. However, we have found this to be applicable only to certain members of the family. Other data collected on hickory shad, (unpubl. data), thread herring and Spanish sardine (Hale 1984), and menhaden (Joseph 1985) showed relatively low percentages of isomeric 20:1 and 22:1 acids.

Samples of red snapper we analyzed showed some variation in the concentrations of 16:0, 18:2n6, and 22:6n3 from data reported by Exler and Weihrauch (1976) and Gall et al. (1983). Finne et al. (1980) examined the fatty acid composition of minced Atlantic croaker. Our percentages of 16:1n7, 18:1n9, and 20:1n9 components were lower than their values, but our value for 22:6n3 was twice as great in the lipids of this species. This may be due to the geographical source differences—Atlantic coast versus western Gulf of Mexico.

Several researchers have reported fatty acid data on channel catfish (Worthington et al. 1972; Exler and Weihrauch 1976; Mustafa

and Medeiros 1985). We found much lower amounts of 18:1n9 and 18:2n6 in our samples as compared with their samples. A probable explanation is that the catfish we analyzed were wild specimens caught in Lake Moultrie, South Carolina, whereas their studies were conducted on commercially-raised fish. The dietary intake of commercial catfish feed containing vegetable oils would explain the high percentages of 18:1n9 and 18:2n6 in cultured catfish (Worthington et al. 1972).

There have probably been more data collected and analyzed on the lipids and fatty acids of striped mullet than any other species except those (i.e., menhaden and herring) used in the production of commercial fish oils. The fatty acid compositions of mullet lipids are reported to be distinctive for their high content of odd carbon-chained fatty acids (Gruger et al. 1964; Sen and Schlenk 1964). Deng et al. (1976) found appreciable amounts of C_{17} and C_{19} fatty acids in some of their mullet samples (up to 10.7% C_{17} and 2.5% C_{19}). We did not report C_{17} and C_{19} concentrations in mullet because the highest value was only 1.2%. It is postulated that these odd-chained fatty acids could originate from propionic acid derived from thetin in the diet of phytoplankton that mullets consume (Ackman 1965). A question has arisen as to whether the plankton diet of mullet differs significantly from that of menhaden. Mullet apparently graze both on surface skim and the bottom, ingesting primarily bacteria, free-floating unicellular algae (diatoms and dinoflagellates), detritus, and filamentous algae; whereas menhaden filter out zooplankton, *Spartina* detritus, and Chlorophytes (green algae and stoneworts) selectively by particle size (J. C. DeVane, Charleston Lab., Natl. Mar. Fish. Serv., NOAA, Charleston, SC 29412, pers. commun. Oct. 1986; Jeffries 1975). Our values on mullet were comparable to those of Gruger et al. (1964) and Finne et al. (1980). They differed in some components from data collected by Deng et al. (1976), Exler and Weihrauch (1976), and Viswanathan Nair and Gopakumar (1978). Deng's seasonal Florida mullet attained their largest size when the roe was near maturity (in November); spawning occurs around December. Our November samples followed the same trend, but with a much larger increase in fat content and marked changes in the amounts of 18:0, 16:1n7, and 22:6n3 fatty acids (16:1n7 increased 12%; while 18:0 and 22:6n3 decreased 8% and 14%, respectively) as compared with fish analyzed in February, May, and August. Seasonal differences in mullet fatty acid percentages can be influenced by maturity, size, and sex of the fish as well as the availability and nature of the food supply (Gruger 1967).

A similar phenomenon was observed in our September samples of bluefish and crevalle jack. The fat content markedly increased, while the 22:6n3 fatty acid concentration decreased approximately 25%. The amounts of 18:0 and 16:1n7 fatty acids in these two species did not show the same magnitude of change that occurred in the mullet. Seasonal increases in fat content are due to an increase in muscle depot fat rather than an increase in muscle phospholipids. Depot fats consist largely of triglycerides, whose component fatty acids are less polyunsaturated than those of phospholipids (Gruger 1967; Stansby 1973). Therefore, the negative correlation between fat content and 22:6n3 fatty acid levels for these three species was not surprising.

In certain fish species, e.g., dogfish and other sharks, up to 20% of the fatty acids in the flesh may occur as alkoxydiglycerides (Stansby 1973). Upon hydrolysis these yield the usual fatty acids plus glyceryl ethers. Structurally similar neutral plasmalogens (vinyl ethers) are also present as are sterols and hydrocarbons such as squalene, pristane, and zamene (Stansby and Hall 1967). We observed that odd peaks were appearing between the usual fatty acids on the chromatograms for all the analyzed shark samples (both raw and cooked). For example, the raw tiger shark sample collected in July 1985 showed peaks present between 14:0 and 16:0; between 16:0 and 18:0; and between 18:0 and 18:1n9 that could not be identified. These unknowns constituted approximately 6% of the total. Unknown peaks for the cooked sample comprised approximately 11% of the total. In all probability, these unknown components are dimethyl-acetals, artifacts resulting from the use of an acidic transesterification procedure on lipids containing plasmalogens. However, this has not been confirmed.

The proximate chemical composition and fatty acid profiles reported here were obtained as part of a national program to evaluate the edibility characteristics of various finfish species. We recognize that additional data are required to adequately describe the seasonal (and geographic) variations in the chemical compositions of many of these species. We believe, however, that the data reported here can be useful to both the scientific community and to consumers.

ACKNOWLEDGMENTS

The authors thank Gloria Seaborn for performing the GLC fatty acid analyses on a portion of the samples reported here. Christine Williams collected and prepared many of the samples for analysis. We also thank J. D. Joseph for her valuable comments on the manuscript and C. L. Kinerd for his assistance in assembling this document from the various computer sources.

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Table 1—Southeastern U.S. finfish evaluated for proximate and fatty acid composition. Nomenclature from American Fisheries Society (1980).

Species (Common name)	Scientific name	Species (Common name)	Scientific name
Barracuda, Great	*Sphyraena barracuda*	Mullet, Striped	*Mugil cephalus*
Bass, Black Sea	*Centropristis striata*	Pompano, Florida	*Trachinotus carolinus*
Bluefish	*Pomatomus saltatrix*	Porgy, Longspine	*Stenotomus caprinus*
Catfish, Channel	*Ictalurus punctatus*	Porgy, Red	*Pagrus pagrus*
Croaker, Atlantic	*Micropogonias undulatus*	Seatrout, Spotted	*Cynoscion nebulosus*
Dolphin	*Coryphaena hippurus*	Shad, American	*Alosa sapidissima*
Drum, Red	*Sciaenops ocellatus*	Shark, Atlantic Sharpnose	*Rhizoprionodon terraenovae*
Flounder, Southern	*Paralichthys lethostigma*	Shark, Lemon	*Negaprion brevirostris*
Goosefish (Monkfish)	*Lophius americanus*	Shark, Sandbar	*Carcharhinus plumbeus*
Grouper, Gag	*Mycteroperca microlepis*	Shark, Scalloped Hammerhead	*Sphyrna lewini*
Grouper, Scamp	*Mycteroperca phenax*	Shark, Tiger	*Galeocerdo cuvieri*
Grouper, Snowy	*Epinephelus niveatus*	Sheepshead	*Archosargus probatocephalus*
Grouper, Yellowedge	*Epinephelus flavolimbatus*	Snapper, Red	*Lutjanus campechanus*
Grunt, White	*Haemulon plumieri*	Snapper, Vermilion	*Rhomboplites aurorubens*
Hind, Speckled	*Epinephelus drummondhayi*	Spot	*Leiostomus xanthurus*
Jack, Crevalle	*Caranx hippos*	Swordfish	*Xiphias gladius*
Kingfish, Southern (Whiting)	*Menticirrhus americanus*	Tilefish	*Lopholatilus chamaeleonticeps*
Ladyfish	*Elops saurus*	Tilefish, Blueline	*Caulolatilus microps*
Mackerel, King	*Scomberomorus cavalla*	Triggerfish, Gray	*Balistes capriscus*
Mackerel, Spanish	*Scomberomorus maculatus*	Weakfish	*Cynoscion regalis*

Table 2—Means and ranges for proximate composition of 40 Southeastern U.S. finfish species (weight % of tissue sample).

Species	No. of samples	Protein	Moisture	Fat	Ash
Barracuda, Great					
raw	2	22.2	77.0	1.0	1.4
		20.4-23.9	76.9-77.0	0.8-1.3	1.3-1.4
cooked	2	27.0	72.6	1.6	1.3
		24.7-29.2	71.3-74.0	1.0-2.2	1.3-1.3
Bass, Black Sea					
raw	2	18.0	81.2	0.7	1.4
		17.8-18.2	81.2-81.3	0.6-0.8	1.1-1.7
cooked	1	26.1	73.0	1.0	1.2
Bluefish					
raw	4	20.1	77.9	2.4	1.0
		18.5-22.2	72.4-80.8	0.6-7.2	0.9-1.1
cooked	4	26.0	71.3	3.5	1.1
		23.6-28.6	65.5-73.7	0.6-10.6	0.9-1.2
Catfish, Channel					
raw	3	16.2	82.1	2.4	1.0
		16.1-16.2	80.3-83.7	1.3-3.6	0.9-1.0
cooked	3	19.3	78.6	2.0	1.0
		19.0-19.8	76.5-81.2	0.8-2.9	1.0-1.0
Croaker, Atlantic					
raw	3	16.8	80.1	2.2	1.0
		14.8-18.3	77.6-83.2	0.8-4.0	0.9-1.2
cooked	3	24.1	74.2	2.1	1.1
		23.7-24.4	73.7-75.0	1.2-3.4	1.0-1.2
Dolphin					
raw	3	20.2	79.7	0.8	1.2
		18.0-22.1	78.7-80.7	0.6-1.1	1.1-1.2
cooked	3	27.2	72.5	1.2	1.3
		26.0-28.2	71.8-73.4	1.0-1.3	1.1-1.4
Drum, Red					
raw	2	19.4	78.8	0.8	1.1
		18.9-20.0	78.7-78.9	0.6-1.1	1.0-1.1
cooked	2	24.6	73.6	1.4	1.1
		24.6-24.6	72.8-74.3	1.0-1.7	1.1-1.1
Flounder, Southern					
raw	2	17.4	82.4	0.6	0.9
		16.3-18.5	81.9-82.8	0.5-0.8	0.8-1.0
cooked	2	20.4	78.4	0.8	1.0
		18.8-22.1	76.9-79.9	0.6-1.0	0.8-1.1
Goosefish					
raw	4	16.0	83.8	0.6	0.9
		15.2-16.6	82.8-85.6	0.4-0.7	0.9-1.0
cooked	3	24.6	75.9	0.8	0.9
		23.2-25.8	74.0-76.9	0.5-1.0	0.8-1.0
Grouper, Gag					
raw	3	21.0	76.8	2.2	1.3
		20.2-21.6	74.4-78.2	1.1-3.6	1.2-1.5
cooked	2	27.2	70.9	2.0	1.2
		26.5-27.9	70.4-71.4	1.9-2.2	1.1-1.2
Grouper, Scamp					
raw	3	19.7	79.2	1.6	1.1
		19.2-20.2	78.8-79.5	1.3-1.8	1.1-1.1
cooked	3	24.6	73.6	2.5	1.2
		22.7-27.5	71.6-75.8	1.3-3.5	1.2-1.3
Grouper, Snowy					
raw	2	20.0	78.8	0.8	1.2
		19.4-20.5	78.6-79.0	0.6-0.9	1.2-1.2
cooked	2	24.9	73.0	1.0	1.3
		24.3-25.5	72.6-73.4	0.5-1.4	1.2-1.3
Grouper, Yellowedge					
raw	3	19.0	79.6	1.0	1.1
		18.4-19.6	78.5-80.4	0.5-1.6	1.1-1.1
cooked	3	26.1	72.1	1.2	1.2
		24.6-28.9	69.1-74.9	0.7-1.5	1.1-1.2
Grunt, White					
raw	3	20.5	80.9	0.7	1.1
		19.4-21.6	80.2-82.0	0.6-1.0	1.0-1.1
cooked	3	25.0	76.1	1.0	1.2
		23.7-26.0	75.4-77.1	0.8-1.5	1.1-1.2

Table 2—(Continued).

Species	No. of samples	Protein	Moisture	Fat	Ash
Hind, Speckled					
raw	4	20.6	75.9	4.4	1.1
		19.2-22.1	72.1-80.0	1.2-7.4	1.1-1.2
cooked	4	26.2	69.2	4.7	1.2
		25.3-27.9	66.7-72.3	1.6-9.0	1.1-1.2
Jack, Crevalle					
raw	4	21.1	74.2	3.9	1.3
		20.1-22.4	68.6-77.8	1.0-11.3	1.1-1.4
cooked	3	25.8	69.0	4.9	1.4
		24.6-26.4	63.3-72.2	1.1-11.8	1.1-1.5
Kingfish, Southern					
raw	3	18.4	78.2	3.5	1.0
		17.8-19.5	74.2-80.3	1.0-7.9	1.0-1.1
cooked	3	23.5	74.1	3.5	1.1
		22.0-26.4	70.9-76.6	1.4-7.0	1.0-1.2
Ladyfish					
raw	3	22.7	73.0	4.4	1.2
		21.8-23.6	69.3-75.3	1.9-8.6	1.1-1.2
cooked	3	24.7	69.2	5.8	1.1
		23.9-25.2	64.7-71.5	3.2-10.3	0.8-1.3
Mackerel, King					
raw	2	21.6	76.6	1.7	1.4
		20.3-23.0	75.6-77.6	0.8-2.6	1.3-1.5
cooked	2	26.4	72.0	2.0	1.4
		26.0-26.7	70.9-73.2	1.0-2.9	1.4-1.5
Mackerel, Spanish					
raw	2	19.8	75.4	4.8	1.3
		19.6-19.9	71.8-78.9	0.7-8.9	1.2-1.4
cooked	2	23.4	70.2	6.6	1.2
		22.5-24.2	65.6-74.9	1.2-12.0	0.9-1.6
Mullet, Striped					
raw	5	19.6	75.1	5.1	1.0
		17.3-20.8	68.5-81.6	0.9-11.8	1.0-1.1
cooked	4	23.4	71.4	5.2	1.1
		23.2-23.8	64.6-76.9	0.9-11.8	1.0-1.2
Pompano, Florida					
raw	2	18.4	77.8	2.8	1.1
		18.2-18.7	76.1-79.5	1.7-4.0	1.0-1.2
cooked	2	22.3	72.3	3.5	1.2
		22.3-22.3	69.7-74.9	1.1-5.9	1.2-1.3
Porgy, Longspine					
raw	2	17.8	80.1	1.4	1.0
		16.9-18.6	78.0-82.2	1.3-1.6	1.0-1.0
cooked	1	23.4	75.4	2.6	1.0
Porgy, Red					
raw	2	21.9	77.2	1.0	1.5
		21.4-22.4	76.7-77.8	0.7-1.3	1.4-1.5
cooked	1	27.3	73.3	0.8	1.6
Seatrout, Spotted					
raw	2	19.4	79.4	2.6	1.1
		19.2-19.5	79.2-79.6	1.6-3.7	1.0-1.1
cooked	2	22.6	73.4	4.6	1.1
		22.4-22.8	70.6-76.1	1.1-8.0	1.0-1.2
Shad, American					
raw	4	19.1	65.4	14.6	1.3
		17.6-21.0	59.8-68.7	10.6-20.3	1.2-1.5
cooked	2	21.6	63.6	14.8	1.0
		20.1-23.0	62.8-64.5	14.6-15.1	0.9-1.2
Shark, Atlantic Sharpnose					
raw	3	23.7	75.1	0.8	1.4
		21.9-26.2	72.6-76.9	0.8-0.8	1.4-1.5
cooked	3	25.4	73.3	0.8	1.5
		24.0-26.6	72.1-74.7	0.8-0.9	1.4-1.5
Shark, Lemon					
raw	2	19.7	79.4	0.6	1.2
		19.5-19.9	79.1-79.8	0.5-0.6	1.1-1.4
cooked	2	24.6	74.4	0.8	1.3
		23.4-25.8	73.3-75.5	0.7-0.8	1.2-1.4
Shark, Sandbar					
raw	1	18.2	81.1	0.5	1.2
cooked	1	25.7	73.1	0.9	1.2
Shark, Scalloped Hammerhead					
raw	2	23.1	76.0	0.6	1.4
		22.4-23.8	75.0-76.9	0.5-0.8	1.2-1.5
cooked	2	29.2	69.7	0.9	1.4
		27.2-31.1	68.0-71.4	0.8-0.9	1.2-1.5
Shark, Tiger					
raw	2	19.2	80.0	0.6	1.2
		17.2-21.2	78.0-82.1	0.6-0.7	1.1-1.2
cooked	2	23.4	75.6	0.8	1.2
		21.2-25.6	73.4-77.9	0.7-0.9	1.2-1.2
Sheepshead					
raw	3	21.4	77.9	1.6	1.2
		20.2-22.4	76.6-79.7	1.2-1.9	1.1-1.3
cooked	3	23.8	73.7	2.0	1.3
		22.1-25.7	72.4-75.4	1.6-2.4	1.2-1.3
Snapper, Red					
raw	3	19.7	78.9	1.2	1.1
		18.5-21.2	76.4-81.1	0.7-1.5	0.9-1.2
cooked	3	24.7	73.3	1.7	1.2
		24.4-25.1	71.7-74.4	0.5-3.2	1.1-1.3
Snapper, Vermilion					
raw	3	20.2	78.9	0.7	1.1
		18.3-21.3	77.1-80.5	0.6-0.8	1.0-1.2
cooked	3	25.3	73.9	0.9	1.3
		23.9-26.9	72.5-75.1	0.7-1.1	1.2-1.4
Spot					
raw	3	18.6	74.6	5.5	1.1
		18.1-19.0	73.0-75.4	4.8-6.0	1.0-1.1
cooked	3	22.5	68.7	8.3	0.9
		21.4-23.0	66.3-70.2	6.7-10.9	0.9-1.0
Swordfish					
raw	1	19.9	76.0	3.7	1.3
cooked	1	23.8	69.9	5.8	1.2
Tilefish					
raw	2	17.6	81.0	1.0	1.2
		17.4-17.7	81.0-81.1	0.8-1.1	1.0-1.5
cooked	1	23.8	74.6	0.7	1.1
Tilefish, Blueline					
raw	3	19.7	77.7	3.2	1.3
		18.6-21.1	76.7-78.9	1.4-4.8	1.1-1.5
cooked	3	25.1	72.2	3.2	1.2
		23.8-25.9	70.7-73.4	1.9-5.7	1.1-1.3
Triggerfish, Gray					
raw	4	20.6	79.0	0.7	1.3
		19.4-21.9	78.3-79.9	0.5-1.0	1.2-1.5
cooked	3	26.0	72.8	1.0	1.2
		25.9-26.1	72.2-73.1	0.7-1.4	1.2-1.3
Weakfish					
raw	3	18.7	79.0	1.7	1.1
		17.6-19.5	77.5-80.9	1.0-2.6	1.0-1.1
cooked	3	24.0	72.5	2.2	1.1
		23.5-24.5	72.0-73.3	0.8-3.7	1.0-1.2

Table 3—Means and ranges of selected fatty acids in 40 Southeastern U.S. finfish species (weight % of total fatty acids).

Species	No. of samples	16:0	18:0	16:1n7	18:1n9	18:1n7	20:1n9	20:4n6	22:4n6	20:5n3	22:5n6	22:5n3	22:6n
Barracuda, Great													
raw	2	27.2	9.0	4.6	14.2	3.2	0.6	3.7	1.0	2.4	1.4	2.6	20.4
		24.9-29.6	8.4-9.5	4.1-5.2	11.5-16.8	3.0-3.5	0.5-0.6	3.1-4.3	0.9-1.0	2.0-2.9	1.1-1.7	2.2-3.0	11.9-28.9
cooked	2	22.6	9.6	3.8	11.6	3.0	0.6	5.0	1.3	2.9	1.9	3.2	17.1
		19.6-25.6	9.4-9.7	2.7-4.9	10.5-12.7	2.7-3.4	0.6-0.6	3.7-6.3	0.9-1.7	2.8-2.9	1.5-2.3	3.1-3.3	16.4-17.8
Bass, Black Sea													
raw	2	20.0	8.4	3.4	12.3	3.1	0.8	4.8	1.3	4.9	2.0	2.4	23.4
		18.9-21.2	8.3-8.4	3.0-3.9	9.8-14.8	2.4-3.8	0.5-1.1	4.1-5.6	0.8-1.8	2.8-7.0	1.5-2.5	2.2-2.6	21.9-24.9
cooked	1	20.4	7.8	3.2	15.0	2.5	0.6	5.4	2.0	2.9	2.3	3.0	20.9
Bluefish													
raw	3	21.2	8.1	4.4	12.7	3.4	1.5	2.2	0.4	4.7	0.9	2.7	21.1
		18.3-24.3	7.1-9.1	1.5-9.2	9.6-18.3	2.9-4.3	1.2-1.7	1.4-3.2	TR-0.6	3.9-5.2	0.4-1.5	2.4-3.4	4.1-33.6
cooked	3	21.1	8.0	5.0	12.8	3.5	2.7	2.0	0.4	4.7	0.8	2.7	16.7
		16.9-24.7	6.7-8.9	2.1-9.3	9.8-18.0	3.1-4.3	1.2-5.1	1.3-2.8	0.2-0.5	3.6-5.6	0.4-1.3	2.3-3.5	3.4-28.5
Catfish, Channel													
raw	3	18.4	5.2	6.2	22.5	5.0	1.4	3.9	0.4	3.7	1.6	2.5	4.8
		17.9-18.8	4.4-6.0	4.9-7.8	16.2-27.0	4.3-6.0	0.8-1.8	2.5-5.6	TR-0.7	3.5-4.1	1.2-2.3	2.0-3.0	3.8-5.4
cooked	2	20.6	5.6	5.8	23.1	4.4	1.6	2.8	0.2	4.8	1.0	2.5	7.4
		20.4-20.8	5.6-5.7	5.6-6.1	20.5-25.7	3.9-4.9	1.6-1.6	2.7-2.9	TR-0.4	4.5-5.1	0.8-1.3	2.3-2.7	6.9-7.9
Croaker, Atlantic													
raw	3	25.0	6.9	11.0	12.0	2.4	0.8	3.2	0.7	4.5	0.6	2.2	6.4
		23.0-28.5	6.7-7.2	9.9-13.1	9.9-13.5	2.2-2.6	0.8-0.8	2.6-3.7	TR-1.2	4.0-5.1	TR-1.0	1.9-2.5	4.5-7.5
cooked	1	23.5	7.6	8.0	10.0	2.8	0.8	4.1	1.4	5.3	1.3	3.0	10.2
Dolphin													
raw	3	17.7	12.5	1.6	8.7	2.2	0.3	3.7	0.1	3.5	2.5	1.4	31.1
		15.5-18.9	12.3-12.7	1.1-2.1	7.8-9.6	2.1-2.3	0.2-0.5	3.1-4.5	TR-0.2	3.0-4.1	2.2-2.7	1.4-1.5	28.3-36.5
cooked	3	16.4	13.0	1.1	8.0	2.1	0.1	3.7	0.2	3.3	2.6	1.7	31.9
		13.8-18.5	12.7-13.4	1.0-1.3	6.8-8.9	2.1-2.2	TR-0.2	3.2-4.3	TR-0.4	3.0-3.7	2.4-2.9	1.4-1.9	28.6-36.2
Drum, Red													
raw	2	20.7	7.1	4.1	11.3	2.6	0.6	4.6	1.3	3.8	2.2	3.2	18.2
		19.6-21.8	6.3-7.9	1.5-6.7	7.9-14.7	2.4-2.9	0.4-0.8	3.0-6.3	0.7-1.9	3.7-4.0	1.1-3.4	2.4-4.1	13.2-23.2
cooked	2	18.9	9.0	4.2	10.7	3.0	0.7	4.9	1.3	4.0	2.2	3.6	17.5
		15.6-22.2	7.1-10.9	1.4-7.0	8.3-13.1	3.0-3.0	0.6-0.8	2.9-6.9	0.6-2.0	3.6-4.3	1.5-2.9	2.3-4.8	13.9-21.1
Flounder, Southern													
raw	2	21.6	5.8	4.6	9.1	2.8	0.7	3.0	0.5	3.6	1.4	3.0	21.7
		20.1-23.2	5.8-5.9	3.7-5.5	8.6-9.6	2.3-3.3	0.6-0.8	2.5-3.4	0.2-0.8	2.9-4.3	1.2-1.6	2.9-3.1	17.8-25.6
cooked	2	21.0	6.0	4.1	8.6	2.6	0.6	3.2	0.7	3.8	1.4	3.1	21.6
		19.9-22.1	5.4-6.7	3.7-4.5	7.8-9.3	2.3-3.0	0.6-0.7	3.0-3.4	0.6-0.8	3.1-4.6	1.4-1.5	3.1-3.1	20.2-23.0
Goosefish													
raw	2	18.0	7.3	2.6	12.8	3.0	0.9	4.1	0.5	7.0	1.4	1.8	24.4
		14.4-21.7	6.8-7.8	2.5-2.8	8.8-16.9	2.9-3.2	0.4-1.4	2.7-5.5	0.4-0.6	5.1-8.8	0.9-2.0	1.6-2.1	23.0-25.8
cooked	1	18.8	8.4	2.5	9.8	3.4	2.0	5.2	0.5	7.9	1.8	1.7	25.5
Grouper, Gag													
raw	3	25.2	8.2	7.7	15.5	3.0	1.0	2.9	0.7	3.4	1.3	1.9	15.4
		24.5-26.5	7.0-9.1	6.2-8.6	13.5-18.4	2.7-3.4	0.6-1.2	2.3-3.5	0.4-0.9	2.9-4.3	1.0-1.4	1.4-2.4	11.0-19.5
cooked	2	23.5	8.4	6.5	15.0	3.0	0.9	3.0	0.6	3.8	1.4	1.9	17.4
		23.0-24.0	8.0-8.8	6.1-6.9	13.1-17.0	2.8-3.1	0.6-1.2	2.8-3.3	0.3-1.0	3.0-4.7	1.1-1.6	1.3-2.5	12.6-22.1
Grouper, Scamp													
raw	1	23.9	8.2	5.2	12.1	2.4	1.0	2.4	0.6	2.5	2.0	2.3	20.9
cooked	2	26.0	7.8	6.8	13.6	2.2	0.8	2.2	0.4	2.4	1.8	1.7	19.8
		25.7-26.4	6.7-8.9	4.4-9.2	11.0-16.1	2.1-2.4	0.7-0.9	1.7-2.7	0.3-0.6	2.3-2.5	1.3-2.2	1.4-2.0	17.4-22.3
Grouper, Snowy													
raw	1	17.7	6.4	2.7	13.6	2.6	3.4	4.0	0.8	3.2	1.9	2.7	22.4
cooked	1	18.7	6.5	2.1	12.0	2.4	2.8	4.9	0.9	3.7	2.2	2.7	25.0
Grouper, Yellowedge													
raw	2	17.5	6.0	3.3	9.4	2.8	3.3	3.4	0.9	3.3	1.8	2.8	20.2
		17.1-17.9	5.8-6.1	2.0-4.6	7.6-11.2	2.1-3.5	3.2-3.4	2.4-4.3	0.8-1.0	3.2-3.4	1.1-2.5	2.5-3.2	17.4-23.1
cooked	2	18.0	6.4	2.4	11.6	2.2	3.7	4.1	0.9	3.3	2.0	2.5	22.5
		15.4-20.6	5.5-7.2	1.9-2.8	10.5-12.7	2.1-2.4	2.1-5.3	3.4-4.8	0.9-0.9	3.3-3.3	1.9-2.2	2.5-2.5	18.0-27.0
Grunt, White													
raw	3	18.2	9.5	2.7	11.9	2.9	0.5	9.7	2.1	5.9	2.0	2.6	18.0
		17.8-19.0	9.1-9.7	1.5-4.4	10.2-13.0	2.1-4.0	0.3-0.9	6.2-12.0	1.7-2.4	5.6-6.5	1.2-2.4	2.4-2.8	10.6-23.1
cooked	3	18.1	9.3	2.6	12.1	2.8	0.4	10.6	2.0	6.5	2.0	2.5	16.8
		17.2-19.1	8.6-9.8	1.7-3.6	10.6-13.5	2.0-3.5	0.2-0.6	7.3-12.7	1.8-2.2	6.3-6.8	1.5-2.4	2.4-2.6	12.1-19.5

TR (trace) = <0.1%.

Table 3—(Continued).

Species	No. of samples	16:0	18:0	16:1n7	18:1n9	18:1n7	20:1n9	20:4n6	22:4n6	20:5n3	22:5n6	22:5n3	22:6n
Hind, Speckled													
raw	3	29.4	8.3	9.0	15.4	2.6	1.4	1.8	0.5	2.7	0.9	1.9	12.4
		26.5-32.6	7.3-9.8	5.6-11.0	11.3-18.5	2.4-2.8	1.1-1.8	0.9-3.2	0.3-0.9	1.4-4.2	0.5-1.2	1.2-2.6	6.4-19.0
cooked	3	26.5	8.1	7.7	13.6	2.4	1.3	2.6	0.8	3.1	1.2	2.0	15.2
		25.0-29.0	6.5-9.7	4.8-10.3	10.4-15.8	2.3-2.5	0.9-1.5	1.3-3.8	0.6-1.0	2.2-4.5	0.8-1.5	1.5-2.7	8.8-21.6
Jack, Crevalle													
raw	4	22.4	10.8	4.0	13.7	3.4	0.6	4.0	1.0	3.8	1.6	2.4	16.2
		19.6-27.2	8.5-13.8	1.8-7.8	8.9-20.9	2.9-4.1	0.4-0.8	2.1-5.7	0.5-1.5	2.9-4.4	0.5-2.4	1.4-3.0	3.3-25.8
cooked	3	22.9	14.0	4.0	14.6	4.0	0.6	3.9	0.7	3.4	1.3	1.8	14.5
		20.2-27.7	9.1-16.7	1.9-7.4	10.9-20.8	3.8-4.2	0.4-0.7	2.2-5.6	0.5-0.8	2.9-3.6	0.6-1.8	1.4-2.1	3.7-21.3
Kingfish, Southern													
raw	2	29.7	5.5	15.9	17.8	3.0	0.6	2.2	0.8	2.8	0.6	1.6	5.4
		28.0-31.4	4.8-6.2	14.1-17.7	14.2-21.5	2.8-3.3	0.6-0.6	1.5-2.8	0.6-0.9	1.4-4.2	0.4-0.8	1.3-2.0	4.1-6.8
cooked	1	31.0	5.0	17.0	18.3	2.8	0.6	1.7	0.7	2.6	0.5	1.6	5.1
Ladyfish													
raw	3	27.6	8.0	6.9	23.3	3.2	0.9	3.2	0.9	2.5	0.8	2.1	7.5
		25.3-30.6	7.5-8.6	6.0-8.6	19.1-30.0	2.5-4.0	0.8-1.0	1.3-5.0	0.4-1.2	1.7-3.2	0.4-1.1	1.4-2.8	4.8-10.0
cooked	3	28.5	8.1	7.2	23.9	3.4	0.9	2.8	0.8	2.2	0.7	1.9	6.6
		25.9-30.6	7.4-8.6	6.2-8.7	19.6-30.3	2.5-4.3	0.8-1.0	1.3-3.7	0.4-1.2	1.7-2.8	0.4-0.9	1.4-2.7	4.7-8.3
Mackerel, King													
raw	2	25.0	10.6	3.4	14.9	3.2	1.0	3.6	0.6	5.2	1.4	1.8	10.9
		21.6-28.4	10.0-11.1	3.2-3.5	8.6-21.2	2.8-3.6	0.4-1.5	1.7-5.5	0.5-0.8	1.6-8.9	1.0-1.7	1.0-2.5	7.8-14.0
cooked	1	20.4	10.6	3.2	8.9	3.0	0.5	5.4	0.8	8.4	1.6	2.4	13.0
Mackerel, Spanish													
raw	2	26.4	9.7	4.2	18.2	4.0	1.0	1.8	0.4	3.9	1.0	1.3	15.0
		26.0-26.8	7.6-11.8	3.4-4.9	17.3-19.0	4.0-4.0	0.9-1.0	1.5-2.2	0.3-0.4	3.0-4.8	0.7-1.2	1.2-1.4	14.5-15.6
cooked	1	25.8	8.3	4.4	20.6	4.1	1.1	1.6	0.3	4.6	0.7	1.4	14.1
Mullet, Striped													
raw	3	24.4	4.9	12.4	5.5	2.6	0.2	4.0	0.5	7.5	0.6	4.1	7.1
		22.4-27.3	2.3-10.1	4.1-18.0	4.7-6.2	2.2-3.0	0.2-0.3	2.2-6.9	0.2-0.8	6.6-8.2	TR-1.6	3.4-5.0	2.3-16.4
cooked	2	24.2	6.8	10.0	7.4	2.8	0.4	5.6	0.6	7.0	1.1	4.2	7.4
		20.2-28.1	2.9-10.8	2.5-17.5	4.9-10.0	2.7-3.0	0.2-0.6	2.2-9.0	0.1-1.2	6.7-7.3	TR-2.2	3.7-4.8	2.8-12.0
Pompano, Florida													
raw	1	28.9	11.6	3.3	25.3	2.3	1.9	1.5	0.8	1.3	0.8	2.1	6.1
cooked	1	28.8	11.7	3.2	24.7	2.2	1.8	1.7	0.9	1.4	0.9	2.0	6.3
Porgy, Longspine													
raw	2	18.2	7.4	3.6	15.8	3.9	1.8	2.5	0.9	7.7	0.8	4.7	13.6
		17.9-18.4	7.2-7.6	3.1-4.2	12.5-19.1	3.8-4.0	1.7-1.8	2.3-2.7	0.9-0.9	7.0-8.4	0.6-0.9	4.2-5.2	11.0-16.3
cooked	1	17.4	7.5	3.7	15.9	4.1	1.8	2.3	0.8	8.0	0.7	4.7	13.2
Porgy, Red													
raw	2	21.2	6.8	2.2	9.5	2.2	0.8	3.4	1.3	3.7	2.0	2.8	27.3
		20.2-22.2	6.4-7.3	1.9-2.4	9.4-9.6	2.1-2.2	0.6-1.1	2.7-4.1	1.0-1.6	2.6-4.8	1.9-2.2	2.7-2.9	25.7-28.9
cooked	1	19.6	6.3	1.8	8.2	2.0	0.5	2.9	0.9	4.4	1.9	2.6	29.5
Seatrout, Spotted													
raw	2	24.9	6.5	12.2	14.3	3.7	0.6	2.4	0.8	4.8	1.0	1.8	8.6
		22.0-27.8	5.5-7.5	8.3-16.2	9.7-18.9	3.6-3.7	0.6-0.6	1.8-3.0	0.7-0.9	4.2-5.4	0.8-1.2	1.6-2.1	6.0-11.2
cooked	2	25.1	7.4	12.0	14.8	3.6	0.5	3.2	0.3	4.6	0.7	2.0	9.8
		22.7-27.5	5.1-9.8	6.6-17.3	10.1-19.4	3.6-3.6	0.5-0.5	2.3-4.0	TR-0.6	4.2-5.0	TR-1.4	1.5-2.6	5.6-13.9
Shad, American													
raw	4	12.6	2.2	2.6	7.6	2.3	19.8	0.2	0.1	3.7	0.1	1.5	6.5
		12.3-13.1	2.0-2.6	2.3-2.9	7.1-8.0	2.0-2.7	18.4-20.6	0.2-0.3	TR-0.3	3.4-4.0	TR-0.2	1.3-1.8	4.9-7.2
cooked	1	12.0	2.0	2.7	7.4	2.2	20.1	0.3	TR	3.9	TR	1.5	6.2
Shark, Atlantic Sharpnose													
raw	3	16.6	14.1	0.9	6.3	3.7	0.4	7.8	5.8	2.2	3.2	3.3	18.5
		15.8-18.2	10.4-16.0	0.8-1.0	6.1-6.5	3.6-3.9	0.3-0.5	6.6-9.6	5.1-6.2	1.8-3.0	2.8-3.7	3.0-3.5	18.1-19.0
cooked	3	16.2	14.9	1.0	6.6	3.9	1.3	8.1	5.4	2.4	3.0	3.1	18.1
		15.0-17.3	10.3-17.3	0.8-1.2	6.4-6.8	3.3-4.4	0.2-3.2	6.8-9.7	4.5-6.4	2.1-2.7	2.8-3.2	2.6-3.4	17.2-19.2
Shark, Lemon													
raw	3	15.2	11.9	1.5	8.9	4.6	0.5	5.8	6.2	2.1	2.3	3.5	15.5
		12.2-17.1	8.4-14.8	1.1-2.0	6.5-11.5	3.1-6.6	TR-0.8	4.4-8.4	4.2-8.8	0.9-3.2	1.3-2.9	1.8-5.3	9.0-21.0
cooked	3	15.9	12.4	1.5	9.2	4.7	0.9	5.9	7.4	2.1	2.6	3.8	16.2
		14.8-17.3	9.7-15.0	1.1-1.7	6.7-11.6	3.6-6.4	0.7-1.1	4.5-8.4	4.0-12.2	0.9-3.1	1.1-3.9	2.4-5.3	11.3-20.6
Shark, Sandbar													
raw	1	12.9	12.1	0.8	6.9	3.9	0.4	13.8	6.8	1.4	3.4	1.2	12.0
Shark, Scalloped Hammerhead													
raw	2	14.0	12.7	1.4	8.9	5.0	0.8	6.2	6.9	2.0	2.4	4.1	15.1
		13.2-14.9	8.9-16.5	0.7-2.1	5.2-12.6	4.9-5.2	0.5-1.0	5.0-7.4	5.4-8.4	1.1-2.9	1.8-3.1	2.8-5.4	11.3-18.9
cooked	2	14.2	13.1	1.5	9.0	5.4	0.8	6.3	6.8	2.0	2.3	4.1	14.3
		13.6-14.9	9.5-16.7	0.7-2.3	5.3-12.8	5.2-5.6	0.5-1.1	5.3-7.3	5.2-8.3	1.2-2.7	1.6-3.0	2.8-5.4	10.9-17.7

Table 3—(Continued).

Species	No. of samples	16:0	18:0	16:1n7	18:1n9	18:1n7	20:1n9	20:4n6	22:4n6	20:5n3	22:5n6	22:5n3	22:6n
Shark, Tiger													
raw	2	10.2	15.6	1.9	19.0	4.4	0.6	9.6	2.8	1.6	1.5	2.4	11.3
		8.7-11.6	13.3-17.8	1.6-2.2	16.9-21.0	4.1-4.6	0.4-0.8	8.1-11.0	2.5-3.0	1.3-1.9	1.4-1.6	1.7-3.1	10.2-12.4
cooked	1	9.5	19.3	1.7	18.6	4.4	0.8	11.6	3.0	1.2	1.6	2.0	9.9
Sheepshead													
raw	3	23.0	6.4	6.3	20.2	3.2	0.8	4.6	1.1	3.9	0.9	2.8	6.4
		22.8-23.1	5.3-7.0	5.1-8.0	15.9-27.6	3.1-3.2	0.6-1.0	3.2-7.0	0.8-1.6	2.5-4.8	0.5-1.2	2.1-3.3	4.2-8.2
cooked	3	22.6	6.8	6.7	23.0	3.5	0.9	4.9	1.1	3.7	0.7	2.7	5.8
		21.8-23.7	5.4-7.7	4.7-9.2	18.4-30.8	3.2-3.7	0.6-1.1	2.9-6.7	0.7-1.6	2.1-4.9	0.4-0.9	1.7-3.2	3.1-8.8
Snapper, Red													
raw	2	23.8	9.3	4.2	17.0	2.7	1.2	2.8	0.7	3.4	1.3	1.9	18.7
		22.4-25.2	8.5-10.1	4.0-4.4	15.3-18.7	2.4-3.0	1.0-1.5	2.1-3.5	0.6-0.8	3.0-3.9	1.2-1.3	1.7-2.1	16.9-20.5
cooked	1	25.1	9.9	3.9	14.2	3.0	0.8	3.2	0.8	4.0	1.3	2.1	20.2
Snapper, Vermilion													
raw	1	20.6	8.9	1.4	7.0	1.6	0.9	4.2	0.8	3.2	3.5	1.4	26.3
cooked	1	21.2	8.6	1.2	6.3	1.3	0.6	4.2	0.7	3.0	3.7	1.2	28.7
Spot													
raw	1	25.7	7.2	9.0	17.8	3.1	1.5	1.4	0.7	3.0	0.5	1.8	4.6
Swordfish													
raw	1	16.9	5.0	3.1	26.6	2.5	4.3	1.8	0.6	2.9	1.0	2.5	17.9
cooked	1	17.7	5.8	2.9	29.1	2.3	5.3	1.5	0.6	2.2	0.8	2.2	12.2
Tilefish													
raw	2	18.8	5.4	4.1	17.2	3.8	2.9	2.4	1.0	2.8	1.2	3.4	20.3
		18.6-18.9	5.2-5.6	3.2-5.0	16.4-18.0	3.2-4.3	2.8-2.9	2.3-2.6	0.9-1.0	2.4-3.3	1.1-1.4	3.0-3.9	17.2-23.4
cooked	1	18.0	5.8	3.7	17.8	3.6	3.4	2.3	0.8	2.6	1.2	2.8	19.0
Tilefish, Blueline													
raw	2	21.0	6.6	4.6	17.5	3.4	3.0	2.2	1.1	2.8	1.2	3.4	13.8
		17.8-24.2	5.3-8.0	4.3-4.9	14.3-20.7	3.2-3.7	1.7-4.2	1.7-2.7	0.8-1.4	2.8-2.8	0.7-1.8	3.2-3.6	12.6-15.0
cooked	2	21.8	7.8	4.1	18.0	3.8	2.8	2.6	0.9	2.9	1.3	3.3	15.0
		18.7-25.0	6.1-9.5	3.9-4.3	15.9-20.0	3.6-3.9	2.0-3.5	2.2-3.0	0.8-1.0	2.6-3.2	0.8-1.8	3.2-3.4	13.4-16.6
Triggerfish, Gray													
raw	2	14.7	12.1	1.0	10.3	3.4	0.3	11.0	1.0	4.2	1.5	2.3	24.4
		14.0-15.4	10.8-13.4	0.6-1.4	9.0-11.6	3.1-3.6	0.3-0.3	8.0-13.9	0.9-1.1	3.6-4.7	1.4-1.6	1.8-2.8	20.2-28.5
cooked	1	16.3	13.5	1.5	9.3	3.8	0.3	13.7	1.0	4.8	1.3	1.9	19.2
Weakfish													
raw	2	21.0	5.1	7.4	15.1	2.3	4.8	1.2	0.2	3.8	0.6	1.4	13.2
		19.8-22.2	5.0-5.1	6.5-8.2	13.2-17.0	2.0-2.6	3.5-6.2	1.1-1.2	0.2-0.2	3.7-3.8	0.5-0.6	1.4-1.4	13.0-13.5
cooked	2	21.2	5.5	7.0	15.0	2.3	4.9	1.2	0.2	3.6	0.6	1.4	12.8
		20.0-22.3	5.2-5.8	5.8-8.2	12.7-17.2	2.0-2.6	3.9-5.9	1.0-1.3	0.1-0.2	3.5-3.7	0.4-0.7	1.3-1.5	11.0-14.5

Tables 4 to 43—Seasonal chemical composition of Southeastern U.S. finfish by species.

Tables 4—Barracuda, Great

	Raw			Cooked		
Date:	8-83	9-83	6-85	8-83	9-83	6-85
Mean cm[1]	ND[2]	142.2	73.2	—	—	—
Mean kg[1]	ND	11.79	2.61	—	—	—
Proximate Compositions (weight % of tissue sample).						
Protein	20.4	ND	23.9	24.7	ND	29.2
Moisture	76.9	ND	77.0	74.0	ND	71.3
Fat	0.8	ND	1.3	1.0	ND	2.2
Ash	1.3	ND	1.4	1.3	ND	1.3
Fatty Acids (weight % of total fatty acids).						
14:0	ND	1.4	1.4	ND	1.6	1.7
16:0	ND	29.6	24.9	ND	19.6	25.6
18:0	ND	8.4	9.5	ND	9.4	9.7
16:1n7	ND	5.2	4.1	ND	2.7	4.9
18:1n9	ND	16.8	11.5	ND	10.5	12.7
18:1n7	ND	3.5	3.0	ND	2.7	3.4
20:1n9	ND	0.6	0.5	ND	0.6	0.6
22:1n11+13	ND	[3]0.1	TR[4]	ND	0.1	0.1
22:1n9	ND	0.1	TR	ND	0.3	0.1
18:2n6	ND	0.5	0.7	ND	0.8	0.8
20:4n6	ND	3.1	4.3	ND	6.3	3.7
22:4n6	ND	0.9	1.0	ND	1.7	0.9
20:5n3	ND	2.0	2.9	ND	2.9	2.8
22:5n6	ND	1.1	1.7	ND	2.3	1.5
22:5n3	ND	2.2	3.0	ND	3.3	3.1
22:6n3	ND	11.9	28.9	ND	16.4	17.8

[1]Measurements are for whole fish unless otherwise indicated.
[2]ND indicates not determined.
[3]Numbers between 0.06% and 0.1% rounded to 0.1%.
[4]TR (trace) indicates a percent < 0.05.

Table 5—Bass, Black Sea

	Raw		Cooked
Date:	4-83	7-83	7-83
Mean cm	26.1	43.5	—
Mean kg	0.25	0.96	—
Proximate Compositions			
Protein	17.8	18.2	26.1
Moisture	81.3	81.2	73.0
Fat	0.8	0.6	1.0
Ash	1.7	1.1	1.2
Fatty Acids			
14:0	1.2	0.9	1.0
16:0	18.9	21.2	20.4
18:0	8.4	8.3	7.8
16:1n7	3.9	3.0	3.2
18:1n9	9.8	14.8	15.0
18:1n7	3.8	2.4	2.5
20:1n9	1.1	0.5	0.6
22:1n11+13	TR	TR	TR
22:1n9	0.9	TR	0.1
18:2n6	0.9	0.7	0.8
20:4n6	4.1	5.6	5.4
22:4n6	0.8	1.8	2.0
20:5n3	7.0	2.8	2.9
22:5n6	1.5	2.5	2.3
22:5n3	2.2	2.6	3.0
22:6n3	24.9	21.9	20.9

Table 6—Bluefish

	Raw			
Date:	4-84	8-84	6-85	9-85
Mean cm	ND	33.6	42.1	41.2
Mean kg	0.93	0.51	0.96	1.13
Proximate Compositions				
Protein	19.2	18.5	22.2	20.4
Moisture	79.2	80.8	79.1	72.4
Fat	0.6	0.8	1.0	7.2
Ash	1.1	0.9	1.1	1.1
Fatty Acids				
14:0	1.7	ND	1.0	3.4
16:0	18.3	ND	21.1	24.3
18:0	8.0	ND	9.1	7.1
16:1n7	2.5	ND	1.5	9.2
18:1n9	9.6	ND	10.5	18.0
18:1n7	3.0	ND	2.9	4.3
20:1n9	1.2	ND	1.7	1.7
22:1n11+13	0.2	ND	1.0	0.2
22:1n9	0.2	ND	0.4	TR
18:2n6	0.6	ND	0.6	2.2
20:4n6	3.2	ND	2.1	1.4
22:4n6	0.6	ND	TR	0.4
20:5n3	5.2	ND	4.9	3.9
22:5n6	1.5	ND	0.8	0.4
22:5n3	3.4	ND	2.4	2.4
22:6n3	25.7	ND	33.6	4.1
	Cooked			
Date:	4-84	8-84	6-85	9-85
Mean cm	—	—	—	—
Mean kg	—	—	—	—
Proximate Compositions				
Protein	25.5	26.1	28.6	23.6
Moisture	72.7	73.3	73.7	65.5
Fat	1.5	0.6	1.4	10.6
Ash	1.2	1.0	1.2	0.9
Fatty Acids				
14:0	2.7	ND	1.3	3.6
16:0	16.9	ND	21.6	24.7
18:0	6.7	ND	8.9	8.3
16:1n7	3.5	ND	2.1	9.3
18:1n9	9.8	ND	10.6	18.0
18:1n7	3.1	ND	3.1	4.3
20:1n9	5.1	ND	1.2	1.7
2:1n11+13	0.2	ND	0.3	0.3
22:1n9	TR	ND	0.3	TR
18:2n6	0.9	ND	0.6	2.1
20:4n6	2.8	ND	1.9	1.3
22:4n6	0.5	ND	0.2	0.4
20:5n3	4.9	ND	5.6	3.6
22:5n6	1.3	ND	0.7	0.4
22:5n3	3.5	ND	2.4	2.3
22:6n3	18.1	ND	28.5	3.4

Table 7—Catfish, Channel[1]

	Raw			Cooked		
Date:	7-85	9-85	11-85	7-85	9-85	11-85
Mean cm	33.6	36.3	38.9	—	—	—
Mean kg	0.57	0.47	0.62	—	—	—
Proximate Compositions						
Protein	16.1	16.2	16.2	19.2	19.0	19.8
Moisture	80.3	83.7	82.4	76.5	81.2	78.1
Fat	3.6	1.3	2.2	2.9	0.8	2.2
Ash	1.0	1.0	0.9	1.0	1.0	1.0
Fatty Acids						
14:0	2.4	1.4	2.2	2.6	ND	3.4
16:0	17.9	18.8	18.6	20.4	ND	20.8
18:0	4.4	6.0	5.2	5.6	ND	5.7
16:1n7	4.9	7.8	6.0	6.1	ND	5.6
18:1n9	24.2	16.2	27.0	25.7	ND	20.5
18:1n7	4.6	6.0	4.3	4.9	ND	3.9
20:1n9	1.5	0.8	1.8	1.6	ND	1.6
2:1n11+13	TR	TR	TR	TR	ND	TR
22:1n9	TR	TR	TR	TR	ND	TR
18:2n6	2.6	3.1	2.2	4.3	ND	1.7
20:4n6	2.5	5.6	3.5	2.7	ND	2.9
22:4n6	0.6	0.7	TR	TR	ND	0.4
20:5n3	3.5	3.5	4.1	4.5	ND	5.1
22:5n6	1.2	2.3	1.3	0.8	ND	1.3
22:5n3	2.5	2.0	3.0	2.3	ND	2.7
22:6n3	3.8	5.4	5.3	6.9	ND	7.9

[1]Fish were wild, not commercially pond-raised.

Table 8—Croaker, Atlantic

	Raw				
Date:	10-82	5-83	7-83	8-84	5-85
Mean cm	ND	25.6	23.5	23.4	24.2
Mean kg	ND	0.19	0.18	0.15	0.16
Proximate Compositions					
Protein	ND	14.8	18.3	17.4	ND
Moisture	ND	83.2	79.5	77.6	ND
Fat	ND	0.8	1.7	4.0	ND
Ash	ND	0.9	1.2	0.9	ND
Fatty Acids					
14:0	1.2	ND	1.3	ND	1.2
16:0	23.0	ND	23.6	ND	28.5
18:0	7.2	ND	6.7	ND	6.9
16:1n7	10.1	ND	9.9	ND	13.1
18:1n9	12.6	ND	9.9	ND	13.5
18:1n7	2.2	ND	2.5	ND	2.6
20:1n9	0.8	ND	0.8	ND	0.8
22:1n11+13	TR	ND	0.5	ND	1.1
22:1n9	0.8	ND	0.2	ND	TR
18:2n6	2.0	ND	0.6	ND	0.5
20:4n6	3.7	ND	3.4	ND	2.6
22:4n6	0.8	ND	1.2	ND	TR
20:5n3	4.4	ND	5.1	ND	4.0
22:5n6	0.6	ND	1.0	ND	TR
22:5n3	1.9	ND	2.5	ND	2.3
22:6n3	4.5	ND	7.5	ND	7.1

	Cooked		
Date:	5-83	7-83	5-85
Mean cm	—	—	—
Mean kg	—	—	—
Proximate Compositions			
Protein	24.4	24.1	23.7
Moisture	75.0	73.8	73.7
Fat	1.2	1.8	3.4
Ash	1.1	1.2	1.0
Fatty Acids			
14:0	ND	1.1	ND
16:0	ND	23.5	ND
18:0	ND	7.6	ND
16:1n7	ND	8.0	ND
18:1n9	ND	10.0	ND
18:1n7	ND	2.8	ND
20:1n9	ND	0.8	ND
22:1n11+13	ND	0.5	ND
22:1n9	ND	0.2	ND
18:2n6	ND	0.6	ND
20:4n6	ND	4.1	ND
22:4n6	ND	1.4	ND
20:5n3	ND	5.3	ND
22:5n6	ND	1.3	ND
22:5n3	ND	3.0	ND
22:6n3	ND	10.2	ND

Table 9—Dolphin

	Raw			Cooked		
Date:	6-83	5-85	9-85	6-83	5-85	9-85
Mean cm	98.0	51.8	55.5	—	—	—
Mean kg	5.55	1.39	1.56	—	—	—
Proximate Compositions						
Protein	18.0	22.1	20.6	26.0	28.2	27.3
Moisture	80.7	79.6	78.7	73.4	72.3	71.8
Fat	0.6	0.8	1.1	1.0	1.3	1.3
Ash	1.1	1.2	1.2	1.1	1.4	1.3
Fatty Acids						
14:0	0.6	0.8	0.9	0.6	0.8	0.9
16:0	15.5	18.9	18.7	13.8	17.0	18.5
18:0	12.7	12.3	12.5	12.7	13.4	13.0
16:1n7	1.1	2.1	1.5	1.0	1.0	1.3
18:1n9	7.8	8.6	9.6	6.8	8.2	8.9
18:1n7	2.3	2.1	2.1	2.1	2.1	2.2
20:1n9	0.5	0.2	0.3	0.1	TR	0.2
22:1n11+13	TR	TR	TR	0.1	TR	TR
22:1n9	TR	TR	TR	TR	TR	TR
18:2n6	0.9	0.7	0.8	0.9	0.8	0.9
20:4n6	4.5	3.5	3.1	4.3	3.2	3.7
22:4n6	0.2	TR	TR	0.4	TR	0.2
20:5n3	3.0	4.1	3.3	3.0	3.7	3.2
22:5n6	2.7	2.2	2.5	2.9	2.4	2.5
22:5n3	1.4	1.5	1.4	1.7	1.9	1.4
22:6n3	28.6	36.5	28.3	30.9	36.2	28.6

Table 10—Drum, Red

	Raw			Cooked		
Date:	10-83	1-84	7-84	10-83	1-84	7-84
Mean cm	41.5	60.8	68.9	—	—	—
Mean kg	0.88	2.51	3.57	—	—	—
Proximate Compositions						
Protein	18.9	20.0	ND	24.6	24.6	ND
Moisture	78.9	78.7	ND	72.8	74.3	ND
Fat	1.1	0.6	ND	1.7	1.0	ND
Ash	1.0	1.1	ND	1.1	1.1	ND
Fatty Acids						
14:0	1.2	ND	0.5	1.4	ND	0.4
16:0	21.8	ND	19.6	22.2	ND	15.6
18:0	6.3	ND	7.9	7.1	ND	10.9
16:1n7	6.7	ND	1.5	7.0	ND	1.4
18:1n9	14.7	ND	7.9	13.1	ND	8.3
18:1n7	2.9	ND	2.4	3.0	ND	3.0
20:1n9	0.8	ND	0.4	0.8	ND	0.6
22:1n11+13	0.2	ND	TR	TR	ND	TR
22:1n9	0.1	ND	0.2	0.1	ND	TR
18:2n6	1.4	ND	0.8	1.7	ND	0.9
20:4n6	3.0	ND	6.3	2.9	ND	6.9
22:4n6	0.7	ND	1.9	0.6	ND	2.0
20:5n3	4.0	ND	3.7	4.3	ND	3.6
22:5n6	1.1	ND	3.4	1.5	ND	2.9
22:5n3	2.4	ND	4.1	2.3	ND	4.8
22:6n3	13.2	ND	23.2	13.9	ND	21.1

Table 11—Flounder, Southern

	Raw		Cooked	
Date:	6-83	7-83	6-83	7-83
Mean cm	35.0	47.8	—	—
Mean kg	0.56	1.45	—	—
Proximate Compositions				
Protein	16.3	18.5	18.8	22.1
Moisture	82.8	81.9	79.9	76.9
Fat	0.8	0.5	1.0	0.6
Ash	0.8	1.0	0.8	1.1
Fatty Acids				
14:0	2.4	1.3	2.3	1.3
16:0	20.1	23.2	19.9	22.1
18:0	5.9	5.8	5.4	6.7
16:1n7	5.5	3.7	4.5	3.7
18:1n9	9.6	8.6	7.8	9.3
18:1n7	3.3	2.3	3.0	2.3
20:1n9	0.8	0.6	0.6	0.7
22:1n11+13	0.3	TR	0.1	TR
22:1n9	TR	TR	TR	TR
18:2n6	2.4	1.2	2.1	1.1
20:4n6	2.5	3.4	3.0	3.4
22:4n6	0.2	0.8	0.6	0.8
20:5n3	4.3	2.9	4.6	3.1
22:5n6	1.2	1.6	1.5	1.4
22:5n3	3.1	2.9	3.1	3.1
22:6n3	17.8	25.6	20.2	23.0

Table 12—Goosefish (Monkfish)

	Raw			
Date:	1-84	2-84	9-84	6-85
Mean cm	*	*	*	*
Mean kg	*	*	*	*
Proximate Compositions				
Protein	15.7	15.2	16.3	16.6
Moisture	83.3	82.8	83.5	85.6
Fat	0.6	0.7	0.4	0.5
Ash	0.9	1.0	0.9	0.9
Fatty Acids				
14:0	0.9	ND	ND	0.9
16:0	14.4	ND	ND	21.7
18:0	6.8	ND	ND	7.8
16:1n7	2.5	ND	ND	2.8
18:1n9	16.9	ND	ND	8.8
18:1n7	3.2	ND	ND	2.9
20:1n9	0.4	ND	ND	1.4
22:1n11+13	0.4	ND	ND	TR
22:1n9	0.9	ND	ND	0.2
18:2n6	1.3	ND	ND	1.2
20:4n6	2.7	ND	ND	5.5
22:4n6	0.4	ND	ND	0.6
20:5n3	5.1	ND	ND	8.8
22:5n6	0.9	ND	ND	2.0
22:5n3	2.1	ND	ND	1.6
22:6n3	23.0	ND	ND	25.8

*Steaks, no data available on length and weight for any samples.

	Cooked		
Date:	2-84	9-84	6-85
Mean cm	—	—	—
Mean kg	—	—	—
Proximate Compositions			
Protein	24.7	23.2	25.8
Moisture	74.0	76.9	76.7
Fat	1.0	0.5	1.0
Ash	1.0	0.8	1.0
Fatty Acids			
14:0	ND	ND	0.7
16:0	ND	ND	18.8
18:0	ND	ND	8.4
16:1n7	ND	ND	2.5
18:1n9	ND	ND	9.8
18:1n7	ND	ND	3.4
20:1n9	ND	ND	2.0
22:1n11+13	ND	ND	TR
22:1n9	ND	ND	TR
18:2n6	ND	ND	1.4
20:4n6	ND	ND	5.2
22:4n6	ND	ND	0.5
20:5n3	ND	ND	7.9
22:5n6	ND	ND	1.8
22:5n3	ND	ND	1.7
22:6n3	ND	ND	25.5

Table 13—Grouper, Gag

	Raw			Cooked	
Date:	3-83	6-83	9-85	6-83	9-85
Mean cm	75.2	75.0	61.0	—	—
Mean kg	5.84	5.36 (gutted)	2.90	—	—
Proximate Compositions					
Protein	20.2	21.6	21.1	26.5	27.9
Moisture	78.2	74.4	77.7	71.4	70.4
Fat	1.1	3.6	2.0	2.2	1.9
Ash	1.5	1.2	1.2	1.1	1.2
Fatty Acids					
14:0	2.8	3.2	3.0	2.4	3.0
16:0	26.5	24.5	24.6	23.0	24.0
18:0	8.4	7.0	9.1	8.0	8.8
16:1n7	8.3	8.6	6.2	6.9	6.1
18:1n9	14.5	18.4	13.5	17.0	13.1
18:1n7	2.7	3.4	3.0	3.1	2.8
20:1n9	1.1	1.2	0.6	1.2	0.6
22:1n11+13	TR	0.3	TR	0.2	TR
22:1n9	0.1	0.2	TR	0.1	TR
18:2n6	0.6	0.8	1.0	0.9	1.0
20:4n6	3.5	2.3	2.8	2.8	3.3
22:4n6	0.8	0.9	0.4	1.0	0.3
20:5n3	2.9	3.0	4.3	3.0	4.7
22:5n6	1.4	1.0	1.4	1.1	1.6
22:5n3	1.8	2.4	1.4	2.5	1.3
22:6n3	15.7	11.0	19.5	12.6	22.1

Table 14—Grouper, Scamp

	Raw			Cooked		
Date:	7-83	9-84	11-84	7-83	9-84	11-84
Mean cm	58.1	62.7	60.0	—	—	—
Mean kg	2.01	3.69 (gutted)	2.94	—	—	—
Proximate Compositions						
Protein	19.2	20.2	19.7	22.7	27.5	23.7
Moisture	79.3	78.8	79.5	73.5	71.6	75.8
Fat	1.3	1.8	1.7	3.5	2.6	1.3
Ash	1.1	1.1	1.1	1.2	1.2	1.3
Fatty Acids						
14:0	ND	ND	2.0	3.1	ND	1.8
16:0	ND	ND	23.9	26.4	ND	25.7
18:0	ND	ND	8.2	6.7	ND	8.9
16:1n7	ND	ND	5.2	9.2	ND	4.4
18:1n9	ND	ND	12.1	16.1	ND	11.0
18:1n7	ND	ND	2.4	2.4	ND	2.1
20:1n9	ND	ND	1.0	0.9	ND	0.7
22:1n11+13	ND	ND	0.4	0.2	ND	0.3
22:1n9	ND	ND	0.2	TR	ND	0.2
18:2n6	ND	ND	0.8	0.8	ND	0.8
20:4n6	ND	ND	2.4	1.7	ND	2.7
22:4n6	ND	ND	0.6	0.3	ND	0.6
20:5n3	ND	ND	2.5	2.5	ND	2.3
22:5n6	ND	ND	2.0	1.3	ND	2.2
22:5n3	ND	ND	2.3	1.4	ND	2.0
22:6n3	ND	ND	20.9	17.4	ND	22.3

Table 15—Grouper, Snowy

	Raw		Cooked	
Date:	5-83	4-84	5-83	4-84
Mean cm	74.5	68.7	—	—
Mean kg	5.47 (gutted)	4.69 (gutted)	—	—
Proximate Compositions				
Protein	20.5	19.4	24.3	25.5
Moisture	78.6	79.0	72.6	73.4
Fat	0.9	0.6	1.4	0.5
Ash	1.2	1.2	1.2	1.3
Fatty Acids				
14:0	1.5	ND	1.1	ND
16:0	17.7	ND	18.7	ND
18:0	6.4	ND	6.5	ND
16:1n7	2.7	ND	2.1	ND
18:1n9	13.6	ND	12.0	ND
18:1n7	2.6	ND	2.4	ND
20:1n9	3.4	ND	2.8	ND
22:1n11+13	2.1	ND	1.7	ND
22:1n9	0.8	ND	0.6	ND
18:2n6	0.8	ND	0.8	ND
20:4n6	4.0	ND	4.9	ND
22:4n6	0.8	ND	0.9	ND
20:5n3	3.2	ND	3.7	ND
22:5n6	1.9	ND	2.2	ND
22:5n3	2.7	ND	2.7	ND
22:6n3	22.4	ND	25.0	ND

Table 16—Grouper, Yellowedge

	Raw			Cooked		
Date:	5-83	8-83	9-84	5-83	8-83	9-84
Mean cm	72.6	76.5	67.2	—	—	—
Mean kg	4.42 (gutted)	4.99	4.13 (gutted)	—	—	—
Proximate Compositions						
Protein	19.6	19.0	18.4	24.8	28.9	24.6
Moisture	78.5	79.8	80.4	72.4	69.1	74.9
Fat	1.6	1.0	0.5	1.4	1.5	0.7
Ash	1.1	1.1	1.1	1.2	1.2	1.1
Fatty Acids						
14:0	2.1	1.6	ND	0.9	2.2	ND
16:0	17.9	17.1	ND	20.6	15.4	ND
18:0	6.1	5.8	ND	7.2	5.5	ND
16:1n7	4.6	2.0	ND	1.9	2.8	ND
18:1n9	7.6	11.2	ND	10.5	12.7	ND
18:1n7	3.5	2.1	ND	2.1	2.4	ND
20:1n9	3.4	3.2	ND	2.1	5.3	ND
22:1n11+13	2.2	3.0	ND	1.1	4.3	ND
22:1n9	0.6	0.5	ND	0.3	0.7	ND
18:2n6	0.9	1.0	ND	0.7	1.1	ND
20:4n6	2.4	4.3	ND	4.8	3.4	ND
22:4n6	0.8	1.0	ND	0.9	0.9	ND
20:5n3	3.4	3.2	ND	3.3	3.3	ND
22:5n6	1.1	2.5	ND	2.2	1.9	ND
22:5n3	3.2	2.5	ND	2.5	2.5	ND
22:6n3	17.4	23.1	ND	27.0	18.0	ND

Table 17—Grunt, White

	Raw			Cooked		
Date:	5-85	6-85	8-85	5-85	6-85	8-85
Mean cm	31.6	34.7	33.3	—	—	—
Mean kg	0.71	0.89	0.83	—	—	—
Proximate Compositions						
Protein	21.6	20.4	19.4	25.2	26.0	23.7
Moisture	80.2	82.0	80.5	75.7	77.1	75.4
Fat	1.0	0.6	0.6	1.5	0.8	0.8
Ash	1.1	1.0	1.1	1.1	1.2	1.2
Fatty Acids						
14:0	2.2	0.4	0.7	1.6	0.5	0.8
16:0	19.0	17.8	17.9	19.1	17.9	17.2
18:0	9.1	9.7	9.6	8.6	9.4	9.8
16:1n7	4.4	1.5	2.1	3.6	1.7	2.5
18:1n9	13.0	10.2	12.4	13.5	10.6	12.2
18:1n7	4.0	2.1	2.6	3.5	2.0	3.0
20:1n9	0.9	0.3	0.4	0.6	0.2	0.4
22:1n11+13	0.6	TR	TR	0.4	0.1	0.2
22:1n9	TR	0.3	TR	TR	0.3	TR
18:2n6	0.9	0.7	0.7	0.9	0.9	0.7
20:4n6	6.2	11.0	12.0	7.3	12.7	11.8
22:4n6	1.7	2.1	2.4	1.8	2.1	2.2
20:5n3	6.5	5.6	5.6	6.5	6.8	6.3
22:5n6	1.2	2.4	2.3	1.5	2.4	2.1
22:5n3	2.8	2.6	2.4	2.6	2.5	2.4
22:6n3	10.6	23.1	20.2	12.1	18.9	19.5

Table 18—Hind, Speckled

	Raw			
Date:	11-83	1-84	4-85	6-85
Mean cm	45.8	48.4	63.9	33.0
Mean kg	1.75 (gutted)	2.30	5.35	0.67
Proximate Compositions				
Protein	19.6	19.2	22.1	21.7
Moisture	74.3	77.3	72.1	80.0
Fat	5.5	3.3	7.4	1.2
Ash	1.1	1.1	1.2	1.1
Fatty Acids				
14:0	3.4	ND	3.8	2.0
16:0	29.1	ND	32.6	26.5
18:0	7.3	ND	7.8	9.8
16:1n7	10.5	ND	11.0	5.6
18:1n9	16.4	ND	18.5	11.3
18:1n7	2.4	ND	2.8	2.6
20:1n9	1.3	ND	1.8	1.1
22:1n11+13	TR	ND	TR	TR
22:1n9	0.2	ND	0.4	0.2
18:2n6	0.7	ND	0.5	0.7
20:4n6	1.2	ND	0.9	3.2
22:4n6	0.4	ND	0.3	0.9
20:5n3	2.5	ND	1.4	4.2
22:5n6	1.0	ND	0.5	1.2
22:5n3	1.8	ND	1.2	2.6
22:6n3	11.8	ND	6.4	19.0

	Cooked			
Date:	11-83	1-84	4-85	6-85
Mean cm	—	—	—	—
Mean kg	—	—	—	—
Proximate Compositions				
Protein	25.7	25.3	25.7	27.9
Moisture	71.2	66.7	66.7	72.3
Fat	2.2	6.0	9.0	1.6
Ash	1.2	1.1	1.1	1.2
Fatty Acids				
14:0	2.8	ND	3.6	1.7
16:0	25.5	ND	29.0	25.0
18:0	8.0	ND	6.5	9.7
16:1n7	8.0	ND	10.3	4.8
18:1n9	14.5	ND	15.8	10.4
18:1n7	2.5	ND	2.3	2.5
20:1n9	1.5	ND	1.5	0.9
22:1n11+13	0.1	ND	0.3	TR
22:1n9	0.3	ND	0.6	0.2
18:2n6	0.7	ND	0.5	0.7
20:4n6	2.8	ND	1.3	3.8
22:4n6	0.8	ND	0.6	1.0
20:5n3	2.7	ND	2.2	4.5
22:5n6	1.5	ND	0.8	1.4
22:5n3	1.8	ND	1.5	2.7
22:6n3	15.1	ND	8.8	21.6

Table 19—Jack, Crevalle

	Raw			
Date:	3-83	7-85	8-85	9-85
Mean cm	ND	54.5	46.2	39.0
Mean kg	13.15	3.33	1.93	1.40
Proximate Compositions				
Protein	22.4	20.8	21.2	20.1
Moisture	73.5	77.8	77.1	68.6
Fat	1.8	1.0	1.5	11.3
Ash	1.4	1.4	1.4	1.1
Fatty Acids				
14:0	2.2	0.6	1.7	2.0
16:0	21.4	19.6	21.3	27.2
18:0	9.6	11.5	13.8	8.5
16:1n7	3.6	1.8	3.0	7.8
18:1n9	12.8	8.9	12.3	20.9
18:1n7	2.9	3.0	3.6	4.1
20:1n9	0.8	0.4	0.6	0.6
22:1n11+13	0.5	0.1	TR	TR
22:1n9	0.2	TR	TR	0.1
18:2n6	0.9	0.6	0.7	3.0
20:4n6	4.0	5.7	4.3	2.1
22:4n6	1.5	1.1	0.8	0.5
20:5n3	4.1	4.0	4.4	2.9
22:5n6	1.7	2.4	1.6	0.5
22:5n3	3.0	2.6	2.5	1.4
22:6n3	14.6	25.8	20.9	3.3

	Cooked		
Date:	7-85	8-85	9-85
Mean cm	—	—	—
Mean kg	—	—	—
Proximate Compositions			
Protein	26.3	26.4	24.6
Moisture	72.2	71.4	63.3
Fat	1.1	1.8	11.8
Ash	1.5	1.5	1.1
Fatty Acids			
14:0	0.5	1.6	1.9
16:0	20.2	20.8	27.7
18:0	16.1	16.7	9.1
16:1n7	1.9	2.6	7.4
18:1n9	10.9	12.1	20.8
18:1n7	3.8	4.2	4.1
20:1n9	0.4	0.7	0.6
22:1n11+13	TR	TR	0.1
22:1n9	TR	TR	0.1
18:2n6	0.5	0.8	2.8
20:4n6	5.6	4.0	2.2
22:4n6	0.8	0.8	0.5
20:5n3	3.6	3.6	2.9
22:5n6	1.8	1.5	0.6
22:5n3	1.9	2.1	1.4
22:6n3	21.3	18.5	3.7

Table 20—Kingfish, Southern

	Raw			Cooked		
Date:	9-84	10-84	11-84	9-84	10-84	11-84
Mean cm	25.1	28.1	30.6	—	—	—
Mean kg	0.18	0.27	0.32	—	—	—
Proximate Compositions						
Protein	18.0	19.5	17.8	22.2	26.4	22.0
Moisture	80.1	80.3	74.2	76.6	74.8	70.9
Fat	1.5	1.0	7.9	1.4	2.2	7.0
Ash	1.0	1.1	1.0	1.0	1.2	1.2
Fatty Acids						
14:0	ND	2.3	2.4	ND	ND	2.5
16:0	ND	28.0	31.4	ND	ND	31.0
18:0	ND	6.2	4.8	ND	ND	5.0
16:1n7	ND	14.1	17.7	ND	ND	17.0
18:1n9	ND	14.2	21.5	ND	ND	18.3
18:1n7	ND	3.3	2.8	ND	ND	2.8
20:1n9	ND	0.6	0.6	ND	ND	0.6
22:1n11+13	ND	0.1	0.2	ND	ND	0.1
22:1n9	ND	0.1	0.1	ND	ND	0.1
18:2n6	ND	0.5	0.4	ND	ND	0.4
20:4n6	ND	2.8	1.5	ND	ND	1.7
22:4n6	ND	0.9	0.6	ND	ND	0.7
20:5n3	ND	4.2	1.4	ND	ND	2.6
22:5n6	ND	0.8	0.4	ND	ND	0.5
22:5n3	ND	2.0	1.3	ND	ND	1.6
22:6n3	ND	6.8	4.1	ND	ND	5.1

Table 21—Ladyfish

	Raw			Cooked		
Date:	8-85	9-26-85	9-27-85	8-85	9-26-85	9-27-85
Mean cm	48.5	37.7	37.7	—	—	—
Mean kg	1.41	0.86 (H&G)	0.86 (H&G)	—	—	—
Proximate Compositions						
Protein	22.7	21.8	23.6	24.9	23.9	25.2
Moisture	69.3	75.3	74.5	64.7	71.5	71.4
Fat	8.6	2.8	1.9	10.3	4.0	3.2
Ash	1.1	1.2	1.2	0.8	1.3	1.2
Fatty Acids						
14:0	1.7	2.3	2.0	1.6	2.4	2.4
16:0	30.6	27.0	25.3	30.6	29.0	25.9
18:0	7.5	8.0	8.6	7.4	8.4	8.6
16:1n7	8.6	6.2	6.0	8.7	6.6	6.2
18:1n9	30.0	20.9	19.1	30.3	21.9	19.6
18:1n7	2.5	3.0	4.0	2.5	3.4	4.3
20:1n9	0.8	1.0	0.8	0.8	1.0	0.9
22:1n11+13	TR	TR	0.1	TR	TR	0.1
22:1n9	TR	TR	TR	TR	TR	TR
18:2n6	0.6	0.6	0.9	0.7	0.7	0.9
20:4n6	1.3	3.3	5.0	1.3	3.3	3.7
22:4n6	0.4	1.0	1.2	0.4	0.9	1.2
20:5n3	1.7	2.5	3.2	1.7	2.1	2.8
22:5n6	0.4	1.1	0.8	0.4	0.9	0.8
22:5n3	1.4	2.0	2.8	1.4	1.6	2.7
22:6n3	4.8	10.0	7.8	4.7	8.3	6.7

Table 22—Mackerel, King

	Raw		Cooked	
Date:	9-83	5-85	9-83	5-85
Mean cm	106.7	82.9	—	—
Mean kg	7.26	3.79	—	—
Proximate Compositions				
Protein	20.3	23.0	26.0	26.7
Moisture	77.6	75.6	73.2	70.9
Fat	0.8	2.6	1.0	2.9
Ash	1.3	1.5	1.5	1.4
Fatty Acids				
14:0	1.5	1.9	1.5	ND
16:0	21.6	28.4	20.4	ND
18:0	10.0	11.1	10.6	ND
16:1n7	3.2	3.5	3.2	ND
18:1n9	8.6	21.2	8.9	ND
18:1n7	2.8	3.6	3.0	ND
20:1n9	0.4	1.5	0.5	ND
22:1n11+13	0.3	0.1	0.4	ND
22:1n9	0.1	0.6	0.2	ND
18:2n6	1.3	0.9	1.4	ND
20:4n6	5.5	1.7	5.4	ND
22:4n6	0.8	0.5	0.8	ND
20:5n3	8.9	1.6	8.4	ND
22:5n6	1.7	1.0	1.6	ND
22:5n3	2.5	1.0	2.4	ND
22:6n3	14.0	7.8	13.0	ND

Table 23—Mackerel, Spanish

	Raw			Cooked	
Date:	8-12-85	8-20-85	10-85	8-12-85	10-85
Mean cm	38.1	41.4	44.6	—	—
Mean kg	0.48	0.62	0.92	—	—
Proximate Compositions					
Protein	19.9	ND	19.6	24.2	22.5
Moisture	78.9	ND	71.8	74.9	65.6
Fat	0.7	ND	8.9	1.2	12.0
Ash	1.4	ND	1.2	1.6	0.9
Fatty Acids					
14:0	ND	1.8	2.6	ND	2.4
16:0	ND	26.8	26.0	ND	25.8
18:0	ND	11.8	7.6	ND	8.3
16:1n7	ND	3.4	4.9	ND	4.4
18:1n9	ND	17.3	19.0	ND	20.6
18:1n7	ND	4.0	4.0	ND	4.1
20:1n9	ND	1.0	0.9	ND	1.1
22:1n11+13	ND	TR	TR	ND	0.1
22:1n9	ND	TR	0.2	ND	0.2
18:2n6	ND	0.7	0.9	ND	0.9
20:4n6	ND	2.2	1.5	ND	1.6
22:4n6	ND	0.4	0.3	ND	0.3
20:5n3	ND	3.0	4.8	ND	4.6
22:5n6	ND	1.2	0.7	ND	0.7
22:5n3	ND	1.2	1.4	ND	1.4
22:6n3	ND	15.6	14.5	ND	14.1

Table 24—Mullet, Striped

	Raw				
Date:	2-84	8-84	5-85	11-4-85	11-4-85
Mean cm	33.9	27.6	32.3	41.0	ND
Mean kg	0.35	0.62	0.39	1.15 (ripe females)	ND (males)
Proximate Compositions					
Protein	17.3	19.9	20.8	19.7	20.5
Moisture	81.6	74.2	80.1	68.5	70.9
Fat	1.0	3.0	0.9	11.8	8.8
Ash	1.0	1.1	1.0	1.1	1.0
Fatty Acids					
14:0	ND	ND	2.4	6.7	5.4
15:0	ND	ND	0.8	3.0	8.4
16:0	ND	ND	22.4	27.3	23.6
18:0	ND	ND	10.1	2.4	2.3
16:1n7	ND	ND	4.1	18.0	15.1
18:1n9	ND	ND	4.7	6.2	5.5
18:1n7	ND	ND	2.2	3.0	2.6
20:1n9	ND	ND	0.3	0.2	0.2
22:1n11+13	ND	ND	TR	TR	TR
22:1n9	ND	ND	TR	TR	TR
18:2n6	ND	ND	1.5	1.3	1.0
20:4n6	ND	ND	6.9	2.2	2.9
22:4n6	ND	ND	0.8	0.2	0.4
20:5n3	ND	ND	8.2	7.8	6.6
22:5n6	ND	ND	1.6	TR	TR
22:5n3	ND	ND	5.0	3.9	3.4
22:6n3	ND	ND	16.4	2.6	2.3

	Cooked			
Date:	2-84	8-84	5-85	11-4-85
Mean cm	—	—	—	—
Mean kg	—	—	—	— (ripe females)
Proximate Compositions				
Protein	23.2	23.4	23.8	23.2
Moisture	75.1	69.2	76.9	64.6
Fat	1.7	6.4	0.9	11.8
Ash	1.1	1.2	1.0	1.0
Fatty Acids				
14:0	ND	ND	1.2	6.5
15.0	ND	ND	1.7	3.0
16:0	ND	ND	20.2	28.1
18:0	ND	ND	10.8	2.9
16:1n7	ND	ND	2.5	17.5
18:1n9	ND	ND	4.9	10.0
18:1n7	ND	ND	2.7	3.0
20:1n9	ND	ND	0.6	0.2
22:1n11+13	ND	ND	1.0	TR
22:1n9	ND	ND	0.2	TR
18:2n6	ND	ND	0.9	1.2
20:4n6	ND	ND	9.0	2.2
22:4n6	ND	ND	1.2	0.1
20:5n3	ND	ND	6.7	7.3
22:5n6	ND	ND	2.2	TR
22:5n3	ND	ND	4.8	3.7
22:6n3	ND	ND	12.0	2.8

Table 25—Pompano, Florida

	Raw			Cooked		
Date:	7-84	8-84	4-86	7-84	8-84	4-86
Mean cm	33.0	19.0	31.2	—	—	—
Mean kg	0.74	0.17	0.69	—	—	—
Proximate Compositions						
Protein	ND	18.7	18.2	ND	22.3	22.3
Moisture	ND	79.5	76.1	ND	74.9	69.7
Fat	ND	1.7	4.0	ND	1.1	5.9
Ash	ND	1.0	1.2	ND	1.2	1.3
Fatty Acids						
14:0	1.5	ND	ND	1.6	ND	ND
16:0	28.9	ND	ND	28.8	ND	ND
18:0	11.6	ND	ND	11.7	ND	ND
16:1n7	3.3	ND	ND	3.2	ND	ND
18:1n9	25.3	ND	ND	24.7	ND	ND
18:1n7	2.3	ND	ND	2.2	ND	ND
20:1n9	1.9	ND	ND	1.8	ND	ND
22:1n11+13	0.2	ND	ND	0.2	ND	ND
22:1n9	0.6	ND	ND	0.5	ND	ND
18:2n6	0.4	ND	ND	0.4	ND	ND
20:4n6	1.5	ND	ND	1.7	ND	ND
22:4n6	0.8	ND	ND	0.9	ND	ND
20:5n3	1.3	ND	ND	1.4	ND	ND
22:5n6	0.8	ND	ND	0.9	ND	ND
22:5n3	2.1	ND	ND	2.0	ND	ND
22:6n3	6.1	ND	ND	6.3	ND	ND

Table 26—Porgy, Longspine

	Raw			Cooked	
Date:	5-3-83	5-24-83	5-84	5-24-83	5-84
Mean cm	25.9	24.6	22.3	—	—
Mean kg	0.43	0.34	0.22	—	—
Proximate Compositions					
Protein	18.6	16.9	ND	23.4	ND
Moisture	78.0	82.2	ND	75.4	ND
Fat	1.6	1.3	ND	2.6	ND
Ash	1 0	1.0	ND	1.0	ND
Fatty Acids					
14:0	2.7	ND	1.7	ND	2.1
16:0	18.4	ND	17.9	ND	17.4
18:0	7.2	ND	7.6	ND	7.5
16:1n7	4.2	ND	3.1	ND	3.7
18:1n9	19.1	ND	12.5	ND	15.9
18:1n7	3.8	ND	4.0	ND	4.1
20:1n9	1.8	ND	1.7	ND	1.8
22:1n11+13	1.0	ND	TR	ND	TR
22:1n9	0.5	ND	0.5	ND	0.7
18:2n6	0.6	ND	0.8	ND	0.8
20:4n6	2.3	ND	2.7	ND	2.3
22:4n6	0.9	ND	0.9	ND	0.8
20:5n3	7.0	ND	8.4	ND	8.0
22:5n6	0.6	ND	0.9	ND	0.7
22:5n3	4.2	ND	5.2	ND	4.7
22:6n3	11.0	ND	16.3	ND	13.2

Table 27—Porgy, Red

	Raw			Cooked	
Date:	4-83	6-83	8-83	6-83	8-83
Mean cm	40.5	35.9	ND	—	—
Mean kg	1.19	0.97	ND	—	—
Proximate Compositions					
Protein	22.4	21.4	ND	27.3	ND
Moisture	76.7	77.8	ND	73.3	ND
Fat	1.3	0.7	ND	0.8	ND
Ash	1.4	1.5	ND	1.6	ND
Fatty Acids					
14:0	0.8	ND	1.7	ND	1.5
16:0	22.2	ND	20.2	ND	19.6
18:0	7.3	ND	6.4	ND	6.3
16:1n7	1.9	ND	2.4	ND	1.8
18:1n9	9.6	ND	9.4	ND	8.2
18:1n7	2.1	ND	2.2	ND	2.0
20:1n9	1.1	ND	0.6	ND	0.5
22:1n11+13	0.4	ND	TR	ND	TR
22:1n9	0.2	ND	0.2	ND	TR
18:2n6	0.6	ND	0.8	ND	0.8
20:4n6	4.1	ND	2.7	ND	2.9
22:4n6	1.6	ND	1.0	ND	0.9
20:5n3	2.6	ND	4.8	ND	4.4
22:5n6	2.2	ND	1.9	ND	1.9
22:5n3	2.9	ND	2.7	ND	2.6
22:6n3	28.9	ND	25.7	ND	29.5

Table 28—Seatrout, Spotted

	Raw		Cooked	
Date:	5-85	9-85	5-85	9-85
Mean cm	46.6	31.4	—	—
Mean kg	1.07	0.3	—	—
Proximate Compositions				
Protein	19.5	19.2	22.4	22.8
Moisture	79.2	79.6	70.6	76.1
Fat	3.7	1.6	8.0	1.1
Ash	1.0	1.1	1.0	1.2
Fatty Acids				
14:0	3.0	3.3	2.9	1.6
16:0	27.8	22.0	27.5	22.7
18:0	5.5	7.5	5.1	9.8
16:1n7	16.2	8.3	17.3	6.6
18:1n9	18.9	9.7	19.4	10.1
18:1n7	3.7	3.6	3.6	3.6
20:1n9	0.6	0.6	0.5	0.5
22:1n11+13	TR	TR	TR	TR
22:1n9	TR	TR	TR	TR
18:2n6	0.7	1.2	0.7	0.9
20:4n6	1.8	3.0	2.3	4.0
22:4n6	0.9	0.7	TR	0.6
20:5n3	4.2	5.4	4.2	5.0
22:5n6	0.8	1.2	TR	1.4
22:5n3	1.6	2.1	1.5	2.6
22:6n3	6.0	11.2	5.6	13.9

Table 29—Shad, American

	Raw			
Date:	3-3-83	3-15-83	4-84	2-85
Mean cm	ND	40.5	ND	39.6
Mean kg	1.14	1.12	1.18	1.04
Proximate Compositions				
Protein	18.7	17.6	19.0	21.0
Moisture	65.6	59.8	68.7	67.5
Fat	14.5	20.3	10.6	13.0
Ash	1.4	1.2	1.2	1.5
Fatty Acids				
14:0	4.7	4.5	4.2	3.9
16:0	12.3	12.3	12.5	13.1
18:0	2.1	2.0	2.2	2.6
16:1n7	2.3	2.4	2.9	2.7
18:1n9	7.1	7.4	7.7	8.0
18:1n7	2.0	2.2	2.3	2.7
20:1n9	20.6	19.8	20.3	18.4
22:1n11+13	19.1	19.8	17.7	22.1
22:1n9	1.2	1.1	1.4	1.4
18:2n6	1.6	1.3	1.2	1.1
20:4n6	0.2	0.2	0.3	0.2
22:4n6	0.3	0.1	TR	TR
20:5n3	3.7	4.0	3.8	3.4
22:5n6	0.1	0.2	TR	TR
22:5n3	1.5	1.5	1.8	1.3
22:6n3	7.2	7.2	6.6	4.9

	Cooked	
Date:	4-84	2-85
Mean cm	—	—
Mean kg	—	—
Proximate Compositions		
Protein	20.1	23.0
Moisture	64.5	62.8
Fat	14.6	15.1
Ash	1.2	0.9
Fatty Acids		
14:0	4.3	ND
16:0	12.0	ND
18:0	2.0	ND
16:1n7	2.7	ND
18:1n9	7.4	ND
18:1n7	2.2	ND
20:1n9	20.1	ND
22:1n11+13	19.6	ND
22:1n9	1.4	ND
18:2n6	1.4	ND
20:4n6	0.3	ND
22:4n6	TR	ND
20:5n3	3.9	ND
22:5n6	TR	ND
22:5n3	1.5	ND
22:6n3	6.2	ND

Table 30—Shark, Atlantic Sharpnose

	Raw			Cooked		
Date:	12-83	6-85	8-85	12-83	6-85	8-85
Mean cm	ND	50.5	57.3	—	—	—
Mean kg	[1]7.60	[1]3.90	[1]6.80	—	—	—
Proximate Compositions						
Protein	26.2	21.9	23.0	26.6	24.0	25.5
Moisture	72.6	76.9	75.7	72.1	74.7	73.2
Fat	0.8	0.8	0.8	0.8	0.9	0.8
Ash	1.4	1.5	1.4	1.4	1.5	1.5
Fatty Acids						
14:0	0.3	TR	0.2	0.8	TR	TR
16:0	18.2	15.8	15.9	17.3	15.0	16.3
18:0	10.4	16.0	16.0	10.3	17.3	17.1
16:1n7	1.0	0.8	0.8	1.2	0.9	0.8
18:1n9	6.4	6.1	6.5	6.4	6.8	6.5
18:1n7	3.7	3.6	3.9	3.3	4.4	3.9
20:1n9	0.5	0.3	0.5	3.2	0.2	0.4
22:1n11+13	0.4	TR	TR	2.9	TR	TR
22:1n9	TR	TR	TR	0.2	TR	TR
18:2n6	0.4	0.4	0.4	0.6	0.5	0.5
20:4n6	6.6	9.6	7.1	6.8	9.7	7.9
22:4n6	6.2	5.1	6.2	5.2	4.5	6.4
20:5n3	1.9	3.0	1.8	2.5	2.7	2.1
22:5n6	3.7	3.1	2.8	3.2	2.8	2.9
22:5n3	3.5	3.0	3.4	3.3	2.6	3.4
22:6n3	18.5	18.1	19.0	17.2	17.9	19.2

[1]Whole weight estimated from carcass.

Table 31—Shark, Lemon

	Raw			Cooked		
Date:	9-83	12-83	6-85	9-83	12-83	6-85
Mean cm	ND	ND	183.0	—	—	—
Mean kg	[1]13.60	[1]22.70	[2]60.50	—	—	—
Proximate Compositions						
Protein	19.5	ND	19.9	25.8	ND	23.4
Moisture	79.8	ND	79.1	73.3	ND	75.5
Fat	0.5	ND	0.6	0.7	ND	0.8
Ash	1.1	ND	1.4	1.2	ND	1.4
Fatty Acids						
14:0	1.0	0.3	0.2	0.6	0.4	0.2
16:0	12.2	16.4	17.1	15.7	14.8	17.3
18:0	8.4	12.4	14.8	9.7	12.5	15.0
16:1n7	1.3	2.0	1.1	1.6	1.7	1.1
18:1n9	11.5	6.5	8.8	11.6	6.7	9.2
18:1n7	3.1	6.6	4.0	3.6	6.4	4.2
20:1n9	TR	0.8	0.7	0.9	1.1	0.7
22:1n11+13	1.4	TR	TR	0.4	TR	TR
22:1n9	TR	TR	TR	TR	0.4	TR
18:2n6	TR	1.2	0.6	0.4	1.2	0.6
20:4n6	4.4	4.6	8.4	4.8	4.5	8.4
22:4n6	8.8	4.2	5.7	12.2	4.0	6.0
20:5n3	0.9	3.2	2.2	0.9	3.1	2.2
22:5n6	2.8	1.3	2.9	3.9	1.1	2.9
22:5n3	1.8	5.3	3.3	2.4	5.3	3.7
22:6n3	9.0	21.0	16.6	11.3	20.6	16.8

[1]Whole weight estimated from carcass weight.
[2]Weight estimated from length.

Table 32—Shark, Sandbar

	Raw	Cooked
Date:	8-83	8-83
Mean cm	ND	—
Mean kg	[1]82.60	—
Proximate Compositions		
Protein	18.2	25.7
Moisture	81.1	73.1
Fat	0.5	0.9
Ash	1.2	1.2
Fatty Acids		
14:0	0.1	ND
16:0	12.9	ND
18:0	12.1	ND
16:1n7	0.8	ND
18:1n9	6.9	ND
18:1n7	3.9	ND
20:1n9	0.4	ND
22:1n11+13	TR	ND
22:1n9	0.2	ND
18:2n6	0.6	ND
20:4n6	13.8	ND
22:4n6	6.8	ND
20:5n3	1.4	ND
22:5n6	3.4	ND
22:5n3	1.2	ND
22:6n3	12.0	ND

[1]Whole weight estimated from carcass weight.

Table 33—Shark, Scalloped Hammerhead

	Raw		Cooked	
Date:	12-83	6-85	12-83	6-85
Mean cm	ND	229.0	—	—
Mean kg	[1]149.70	[2]63.50	—	—
Proximate Compositions				
Protein	22.4	23.8	31.1	27.2
Moisture	76.9	75.0	68.0	71.4
Fat	0.5	0.8	0.8	0.9
Ash	1.2	1.5	1.2	1.5
Fatty Acids				
14:0	0.3	TR	0.4	0.2
16:0	14.9	13.2	14.9	13.6
18:0	8.9	16.5	9.5	16.7
16:1n7	2.1	0.7	2.3	0.7
18:1n9	12.6	5.2	12.8	5.3
18:1n7	5.2	4.9	5.6	5.2
20:1n9	1.0	0.5	1.1	0.5
22:1n11+13	TR	TR	TR	TR
22:1n9	0.5	TR	0.5	TR
18:2n6	0.4	0.7	0.4	0.8
20:4n6	5.0	7.4	5.3	7.3
22:4n6	8.4	5.4	8.3	5.2
20:5n3	1.1	2.9	1.2	2.7
22:5n6	3.1	1.8	3.0	1.6
22:5n3	2.8	5.4	2.8	5.4
22:6n3	11.3	18.9	10.9	17.7

[1]Whole weight estimated from carcass weight.
[2]Weight estimated from length.

Table 34—Shark, Tiger

	Raw		Cooked	
Date:	8-83	7-85	8-83	7-85
Mean cm	ND	ND	—	—
Mean kg	[1]11.79 (chunk)	104.33	—	—
Proximate Compositions				
Protein	17.2	21.2	21.2	25.6
Moisture	82.1	78.0	77.9	73.4
Fat	0.6	0.7	0.7	0.9
Ash	1.2	1.1	1.2	1.2
Fatty Acids				
14:0	0.3	0.4	ND	0.3
16:0	8.7	11.6	ND	9.5
18:0	13.3	17.8	ND	19.3
16:1n7	1.6	2.2	ND	1.7
18:1n9	16.9	21.0	ND	18.6
18:1n7	4.1	4.6	ND	4.4
20:1n9	0.4	0.8	ND	0.8
22:1n11+13	0.6	TR	ND	TR
22:1n9	TR	TR	ND	TR
18:2n6	1.2	1.3	ND	1.4
20:4n6	8.1	11.0	ND	11.6
22:4n6	3.0	2.5	ND	3.0
20:5n3	1.9	1.3	ND	1.2
22:5n6	1.6	1.4	ND	1.6
22:5n3	3.1	1.7	ND	2.0
22:6n3	12.4	10.2	ND	9.9

[1]Estimated whole weight not available.

Table 35—Sheepshead

	Raw			Cooked		
Date:	12-84	1-85	5-85	12-84	1-85	5-85
Mean cm	57.2	36.5	54.2	—	—	—
Mean kg	3.43	1.14	4.89	—	—	—
Proximate Compositions						
Protein	21.7	20.2	22.4	22.1	23.7	25.7
Moisture	76.6	79.7	77.4	72.4	75.4	73.2
Fat	1.7	1.2	1.9	2.1	1.6	2.4
Ash	1.3	1.1	1.2	1.3	1.2	1.3
Fatty Acids						
14:0	2.7	2.4	2.5	3.3	1.8	2.5
16:0	22.8	23.1	23.0	22.4	21.8	23.7
18:0	5.3	7.0	7.0	5.4	7.7	7.3
16:1n7	8.0	5.1	5.9	9.2	4.7	6.2
18:1n9	17.2	15.9	27.6	19.7	18.4	30.8
18:1n7	3.2	3.2	3.1	3.7	3.6	3.2
20:1n9	0.7	0.6	1.0	0.9	0.6	1.1
22:1n11+13	0.1	TR	0.2	0.2	TR	0.1
22:1n9	0.2	0.1	0.3	0.3	TR	0.3
18:2n6	0.5	3.2	0.8	0.4	1.4	0.8
20:4n6	7.0	3.6	3.2	5.0	6.7	2.9
22:4n6	1.6	0.9	0.8	1.6	1.1	0.7
20:5n3	4.8	4.3	2.5	4.0	4.9	2.1
22:5n6	1.0	1.2	0.5	0.8	0.9	0.4
22:5n3	3.3	3.0	2.1	3.1	3.2	1.7
22:6n3	6.8	8.2	4.2	5.6	8.8	3.1

Table 36—Snapper, Red

	Raw			Cooked		
Date:	11-83	8-84	9-85	11-83	8-84	9-85
Mean cm	55.7	31.1	33.6	—	—	—
Mean kg	2.40	0.53	0.67	—	—	—
Proximate Compositions						
Protein	21.2	18.5	19.5	24.7	24.4	25.1
Moisture	76.4	81.1	79.2	71.7	74.4	73.9
Fat	1.5	0.7	1.3	3.2	0.5	1.3
Ash	1.2	0.9	1.2	1.2	1.1	1.3
Fatty Acids						
14:0	2.7	ND	2.2	ND	ND	2.4
16:0	22.4	ND	25.2	ND	ND	25.1
18:0	8.5	ND	10.1	ND	ND	9.9
16:1n7	4.4	ND	4.0	ND	ND	3.9
18:1n9	18.7	ND	15.3	ND	ND	14.2
18:1n7	2.4	ND	3.0	ND	ND	3.0
20:1n9	1.5	ND	1.0	ND	ND	0.8
22:1n11+13	0.9	ND	TR	ND	ND	TR
22:1n9	0.2	ND	TR	ND	ND	TR
18:2n6	0.8	ND	0.6	ND	ND	0.6
20:4n6	2.1	ND	3.5	ND	ND	3.2
22:4n6	0.6	ND	0.8	ND	ND	0.8
20:5n3	3.0	ND	3.9	ND	ND	4.0
22:5n6	1.3	ND	1.2	ND	ND	1.3
22:5n3	1.7	ND	2.1	ND	ND	2.1
22:6n3	16.9	ND	20.5	ND	ND	20.2

Table 37—Snapper, Vermilion

	Raw			Cooked		
Date:	6-83	8-83	9-84	6-83	8-83	9-84
Mean cm	32.5	56.8	36.2	—	—	—
Mean kg	0.57	2.00	0.78	—	—	—
Proximate Compositions						
Protein	18.3	21.3	21.0	23.9	25.0	26.9
Moisture	80.5	79.0	77.1	75.1	74.0	72.5
Fat	0.6	0.7	0.8	0.8	0.7	1.1
Ash	1.2	1.0	1.2	1.4	1.4	1.2
Fatty Acids						
14:0	ND	1.9	ND	ND	1.6	ND
16:0	ND	20.6	ND	ND	21.2	ND
18:0	ND	8.9	ND	ND	8.6	ND
16:1n7	ND	1.4	ND	ND	1.2	ND
18:1n9	ND	7.0	ND	ND	6.3	ND
18:1n7	ND	1.6	ND	ND	1.3	ND
20:1n9	ND	0.9	ND	ND	0.6	ND
22:1n11+13	ND	0.3	ND	ND	0.5	ND
22:1n9	ND	0.5	ND	ND	0.3	ND
18:2n6	ND	0.9	ND	ND	0.9	ND
20:4n6	ND	4.2	ND	ND	4.2	ND
22:4n6	ND	0.8	ND	ND	0.7	ND
20:5n3	ND	3.2	ND	ND	3.0	ND
22:5n6	ND	3.5	ND	ND	3.7	ND
22:5n3	ND	1.4	ND	ND	1.2	ND
22:6n3	ND	26.3	ND	ND	28.7	ND

Table 38—Spot

	Raw			Cooked		
Date:	8-84	9-84	10-84	8-84	9-84	10-84
Mean cm	21.1	21.8	21.5	—	—	—
Mean kg	0.15	0.17	0.17	—	—	—
Proximate Compositions						
Protein	18.6	18.1	19.0	23.0	23.0	21.4
Moisture	75.4	75.3	73.0	70.2	69.5	66.3
Fat	4.8	5.6	6.0	6.7	7.3	10.9
Ash	1.1	1.0	1.1	1.0	0.9	0.9
Fatty Acids						
14:0	ND	ND	2.3	ND	ND	ND
16:0	ND	ND	25.7	ND	ND	ND
18:0	ND	ND	7.2	ND	ND	ND
16:1n7	ND	ND	9.0	ND	ND	ND
18:1n9	ND	ND	17.8	ND	ND	ND
18:1n7	ND	ND	3.1	ND	ND	ND
20:1n9	ND	ND	1.5	ND	ND	ND
22:1n11+13	ND	ND	0.3	ND	ND	ND
22:1n9	ND	ND	0.2	ND	ND	ND
18:2n6	ND	ND	0.6	ND	ND	ND
20:4n6	ND	ND	1.4	ND	ND	ND
22:4n6	ND	ND	0.7	ND	ND	ND
20:5n3	ND	ND	3.0	ND	ND	ND
22:5n6	ND	ND	0.5	ND	ND	ND
22:5n3	ND	ND	1.8	ND	ND	ND
22:6n3	ND	ND	4.6	ND	ND	ND

Table 39—Swordfish

	Raw	Cooked
Date:	7-83	7-83
Mean cm	*	—
Mean kg	*	—
Proximate Compositions		
Protein	19.9	23.8
Moisture	76.0	69.9
Fat	3.7	5.8
Ash	1.3	1.2
Fatty Acids		
14:0	1.9	1.6
16:0	16.9	17.7
18:0	5.0	5.8
16:1n7	3.1	2.9
18:1n9	26.6	29.1
18:1n7	2.5	2.3
20:1n9	4.3	5.3
22:1n11+13	1.2	1.3
22:1n9	0.6	0.7
18:2n6	0.6	0.6
20:4n6	1.8	1.5
22:4n6	0.6	0.6
20:5n3	2.9	2.2
22:5n6	1.0	0.8
22:5n3	2.5	2.2
22:6n3	17.9	12.2

*Steaks, no data available on length and weight.

Table 40—Tilefish

	Raw		Cooked
Date:	4-83	4-84	4-84
Mean cm	60.3	64.6	—
Mean kg	2.92	2.56	—
Proximate Compositions			
Protein	17.4	17.7	23.8
Moisture	81.0	81.1	74.6
Fat	1.1	0.8	0.7
Ash	1.5	1.0	1.1
Fatty Acids			
14:0	2.7	1.9	2.2
16:0	18.6	18.9	18.0
18:0	5.2	5.6	5.8
16:1n7	5.0	3.2	3.7
18:1n9	18.0	16.4	17.8
18:1n7	4.3	3.2	3.6
20:1n9	2.9	2.8	3.4
22:1n11+13	0.7	TR	0.1
22:1n9	0.8	0.8	1.1
18:2n6	0.7	0.7	0.7
20:4n6	2.3	2.6	2.3
22:4n6	1.0	0.9	0.8
20:5n3	3.3	2.4	2.6
22:5n6	1.1	1.4	1.2
22:5n3	3.9	3.0	2.8
22:6n3	17.2	23.4	19.0

Table 41—Tilefish, Blueline

	Raw			Cooked		
Date:	6-83	8-83	5-85	6-83	8-83	5-85
Mean cm	56.6	ND	69.5	—	—	—
Mean kg	2.35	ND	4.07	—	—	—
Proximate Compositions						
Protein	18.6	19.4	21.1	25.6	23.8	25.9
Moisture	77.6	76.7	78.9	72.5	70.7	73.4
Fat	3.5	4.8	1.4	2.0	5.7	1.9
Ash	1.1	1.2	1.5	1.1	1.1	1.3
Fatty Acids						
14:0	3.2	ND	2.9	3.4	ND	2.7
16:0	17.8	ND	24.2	18.7	ND	25.0
18:0	5.3	ND	8.0	6.1	ND	9.5
16:1n7	4.9	ND	4.3	4.3	ND	3.9
18:1n9	20.7	ND	14.3	20.0	ND	15.9
18:1n7	3.7	ND	3.2	3.9	ND	3.6
20:1n9	4.2	ND	1.7	3.5	ND	2.0
22:1n11+13	2.4	ND	0.5	1.6	ND	TR
22:1n9	1.1	ND	0.8	0.9	ND	0.6
18:2n6	0.9	ND	0.9	0.8	ND	0.9
20:4n6	1.7	ND	2.7	2.2	ND	3.0
22:4n6	0.8	ND	1.4	0.8	ND	1.0
20:5n3	2.8	ND	2.8	2.6	ND	3.2
22:5n6	0.7	ND	1.8	0.8	ND	1.8
22:5n3	3.6	ND	3.2	3.4	ND	3.2
22:6n3	12.6	ND	15.0	13.4	ND	16.6

Table 42—Triggerfish, Gray

	Raw			
Date:	4-83	4-84	9-84	9-85
Mean cm	41.3	54.2	36.0	31.2
Mean kg	1.42	4.37	0.98	0.80
Proximate Compositions				
Protein	21.9	21.0	20.1	19.4
Moisture	78.3	78.6	79.3	79.9
Fat	1.0	0.7	0.5	0.6
Ash	1.2	1.3	1.5	1.2
Fatty Acids				
14:0	0.2	ND	ND	0.4
16:0	14.0	ND	ND	15.4
18:0	10.8	ND	ND	13.4
16:1n7	0.6	ND	ND	1.4
18:1n9	11.6	ND	ND	9.0
18:1n7	3.1	ND	ND	3.6
20:1n9	0.3	ND	ND	0.3
22:1n11+13	0.1	ND	ND	0.2
22:1n9	TR	ND	ND	TR
18:2n6	0.4	ND	ND	0.5
20:4n6	8.0	ND	ND	13.9
22:4n6	0.9	ND	ND	1.1
20:5n3	3.6	ND	ND	4.7
22:5n6	1.6	ND	ND	1.4
22:5n3	2.8	ND	ND	1.8
22:6n3	28.5	ND	ND	20.2

	Cooked		
Date:	4-84	9-84	9-85
Mean cm	—	—	—
Mean kg	—	—	—
Proximate Compositions			
Protein	25.9	26.0	26.1
Moisture	72.2	73.1	73.0
Fat	1.4	0.8	0.7
Ash	1.2	1.3	1.2
Fatty Acids			
14:0	ND	ND	0.5
16:0	ND	ND	16.3
18:0	ND	ND	13.5
16:1n7	ND	ND	1.5
18:1n9	ND	ND	9.3
18:1n7	ND	ND	3.8
20:1n9	ND	ND	0.3
22:1n11+13	ND	ND	0.2
22:1n9	ND	ND	TR
18:2n6	ND	ND	0.5
20:4n6	ND	ND	13.7
22:4n6	ND	ND	1.0
20:5n3	ND	ND	4.8
22:5n6	ND	ND	1.3
22:5n3	ND	ND	1.9
22:6n3	ND	ND	19.2

Table 43—Weakfish

	Raw			Cooked		
Date:	6-83	5-84	8-84	6-83	5-84	8-84
Mean cm	ND	72.4	27.8	—	—	—
Mean kg	ND	3.56	0.47	—	—	—
Proximate Compositions						
Protein	19.5	19.0	17.6	23.9	24.5	23.5
Moisture	77.5	78.7	80.9	72.0	73.3	72.1
Fat	2.6	1.5	1.0	3.7	0.8	2.2
Ash	1.0	1.1	1.1	1.0	1.2	1.0
Fatty Acids						
14:0	3.0	2.9	ND	3.2	2.6	ND
16:0	22.2	19.8	ND	22.3	20.0	ND
18:0	5.0	5.1	ND	5.2	5.8	ND
16:1n7	8.2	6.5	ND	8.2	5.8	ND
18:1n9	17.0	13.2	ND	17.2	12.7	ND
18:1n7	2.6	2.0	ND	2.6	2.0	ND
20:1n9	3.5	6.2	ND	3.9	5.9	ND
22:1n11+13	3.4	8.9	ND	4.0	8.6	ND
22:1n9	0.7	TR	ND	0.8	TR	ND
18:2n6	1.1	1.4	ND	1.1	1.4	ND
20:4n6	1.1	1.2	ND	1.0	1.3	ND
22:4n6	0.2	0.2	ND	0.1	0.2	ND
20:5n3	3.7	3.8	ND	3.5	3.7	ND
22:5n6	0.5	0.6	ND	0.4	0.7	ND
22:5n3	1.4	1.4	ND	1.3	1.5	ND
22:6n3	13.0	13.5	ND	11.0	14.5	ND