

Seafood Attitudes and Purchase Data Released

The National Marine Fisheries Service (NMFS) has received the first two sets of data from a three-part "Seafood Consumption Survey" conducted by Market Research Corporation of America¹. The survey was conducted in 1981 using a nationwide panel of 7,500 households. The households completed diaries that provided data on the amount of seafood purchased for home use and on the amount of seafood consumed at home and at restaurants, cafeterias, and other "away-from-home" establishments. The panel households also provided information on attitudes toward seafood. The "purchase" data and "attitudinal" information are now available from NMFS. The "consumption" data, still being processed by Market Research Corporation, were expected to be available in early 1983.

The "purchase" data are presented according to type of seafood products (fresh, frozen, fillets, canned, etc.), by species, region, and a variety of demographics (household size, income, occupation, age, education, race, ethnicity, and religion). The attitudinal information is on type of seafood product, region, and demographics.

The survey is a result of a joint government-industry plan to collect data needed to assess the impact of fishery and other Federal regulations on the seafood industry, to evaluate the nutritional contribution of seafood, and to help with promotional activities.

Data are available in two forms: 1)

¹Mention of trade names or commercial firms does not imply endorsement by the National Marine Fisheries Service, NOAA.

Statistical tabulations on 8½ × 11-inch paper, with tables printed on both sides, and three-hole punched for inserting into a binder; and 2) magnetic tape. Cost of the hardcopy report (three-hole punched) is 3 cents per page (6 cents per sheet); cost of the tape will be about \$50, depending on the data requested. Descriptions of the survey data are listed below by table number.

W.S.C. Sample Composition of Weekly Purchase Diary Reporters

This table presents the number and percent of households sampled in the survey compared with the percent of households in the U.S. Census, by nine Bureau of the Census regions, nine NMFS regions, state, metropolitan area size, household size, household income, number of wage earners, occupation of household head, age of household head, education of household head, employment status of homemaker, age of homemaker, presence of children, sex, race, nativity, and religion (5 pages).

W.1.B. Species Bought by Region

This table presents pounds of seafood purchased per household and per capita, and average price per pound for each of 32 seafood categories, 118 species categories, and the nine Bureau of the Census regions (1,280 pages).

W.2.B. Demographic Profiles of Seafood Buyers

This presents pounds of seafood purchased per household and per capita, and average price per pound of each of 74 seafood products categories, nine Bureau of the Census re-

gions, nine NMFS regions, metro area size, household size, household income, number of wage earners, occupation of household head, age of household head, education of household head, employment status of homemaker, age of homemaker, presence of children, sex, race, nativity, and religion (296 pages).

W.4.B. Species Bought by Month

This table presents pounds of seafood purchased per household and per capita, and average price per pound for each of 15 seafood products categories and 31 species categories, by month with quarterly sub-totals (465 pages).

A.1.W. Household Demographics of Responses to 80 Attitudinal Questions

This table presents numbers and percentage of respondents and their opinions about each of 40 general statements and 40 statements dealing specifically with seafood. This information is presented for each of the demographics in Table W.2.B. (320 pages).

A.2.W. Attitudinal Profiles of Seafood Buyers

This table presents pounds of seafood purchased per household and per capita, and average price per pound for 32 seafood products categories, and associated with responses to each of 80 attitudinal statements (2,560 pages).

More information on the data available or ordering the data, is available from the Resources Statistics Division, National Marine Fisheries Service (F/SR1), NOAA, Washington, DC 20235.

Experimental Processing Lab Set Up at Charleston

As part of the Fisheries Utilization Program of the NMFS Southeast Fisheries Center's Charleston Laboratory in South Carolina, an expanded experimental processing laboratory (EPL) has been completed. The avail-

Table 1.—Available equipment¹ at the Charleston Laboratory EPL.

Item	Item
Lapine filleting machine (½-2 pounds)	Dole plate freezer (39 foot ² or 180 lb/h freezing capacity at -40°F)
Simard fish scaler (½-4 pounds)	Hobart blast freezer (55 foot ²)
Lapine heading machine (½ to 2½ pounds)	Holding freezers (5) (from -20°C to -40°C)
Lapine gutting machine (½-3 pounds)	Stein breeding machine
Bibun deboner (no size limit)	
Dixie retort (automatic steam process controls)	Hollymatic patty former
Can seamers (2) (round cans only: 307 x 409, 301 x 411, 211 x 300, 113 x 409); gas flushing/vacuum sealing capabilities	Arenco fillet skinning machine
Vacuum packaging machine (flexible pouches, small to large)	Freeze dryer (100 pounds water/48 h)
Microwave oven (small - 2450 MHz, 1.5 kilowatt output)	Deep fat fryers (2) (batch type)
Spray dryer (equipped with spray nozzle for liquids)	Refrigerated seawater and chilled seawater fish storage systems
	Torry fish smoker (Minikin: 23 foot ²)
	Meat saw (sanitary, for blocks or steaks)
	Small fish (herring-like) scaler
	Mixers, blenders, cookers, scales, etc.

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able equipment allows the use of most forms of preservation such as freezing, chilling, pasteurization, canning, smoking, salting, pickling, and drying. In addition to whole or headed and gutted fish, product forms such as steaks, fillets, deboned mince, patties, and extrusions are possible. The evaluation of alternate processes using equipment made available on loan, lease, or demonstration basis will be welcomed.

It is planned that the EPL will be used both for NMFS and cooperative studies. For cooperative studies the Charleston Laboratory will provide facilities, equipment, operating and process/product expertise, and will collect and assist in evaluating data. Cooperators will provide their raw material, related supplies, and operational personnel, and will also be involved in data collection and analysis. Cooperators can be individual firms, universities, states, Sea Grant Programs, Fisheries Development Foundations or other U.S. entities. The EPL will also be used as a demonstration facility to provide direct experience or hands-on technology transfer to industry of the information generated on the opportunities and limitations of the underutilized fisheries resources and available processes and product forms or concepts.

It is the intent and desire of the National Marine Fisheries Service to

make our facilities available (on a cooperative scheduled basis) to the industry and various research groups to prepare pilot-scale quantities of products (and intermediates) for experimental purposes. Since government policies restrict the sale or use for personal gain of products prepared in government facilities, it will be necessary that cooperators supply and retain ownership of materials. The government also reserves the right to use experimental data generated by the cooperative efforts and to supervise the use of the EPL. Quantities of products to be processed and duration of the work can be negotiated.

For more information and to express an interest in using the EPL, please contact Lloyd Regier, Charleston Laboratory, Southeast Fisheries Center, NMFS, NOAA, P.O. Box 12607, Charleston, SC 29412-0607 (telephone 803-762-1200).

The Charleston Laboratory

The NMFS Southeast Fisheries Center's Charleston Laboratory develops and provides technological and scientific information and related services to aid in the economical and safe use of fishery resources of the southeastern United States. The "Fisheries Utilization Program" is focused on

the solutions to problems in the handling, processing, nutritional composition, and storage stability of underutilized and traditional species harvested in the region. The "Microconstituents Program" provides an improved detection capability for chemical and biological agents important to human health, and evaluates the significance of these agents, if present in seafood products, and supports research which will assist in resolving identified quality and safety issues. In summary, these programs are designed to provide guidance in the utilization of marine resources while increasing public confidence in seafood products.

The following reports provide summaries of some recent research being conducted at the Charleston Laboratory. Additional information on these topics may be requested by writing or telephoning the noted individual at the Charleston Laboratory, Southeast Fisheries Center, NMFS, NOAA, P.O. Box 12607, Charleston, SC 29412-0607 (telephone 803-762-1200).

1) "Economic Analysis of 'Steam Shock' and 'Pasteurization' Process for Oyster Shucking." This is an evaluation of the variables in the process in terms of cost and potential benefits for methods that can be used to increase shucking rates. (John W. Brown.)

2) "Utilization and Quality Profiles." An annual comprehensive progress report covering recent work on the edibility, composition and frozen storage of several Southeast species. (Malcolm Hale or Beth Elsey.)

3) "Processing Characteristics." The results of laboratory processing studies on several species which were frozen, pasteurized, or canned are included in this brief annual summary report. (Malcolm Hale or Melvin Waters.)

4) "Lipid Oxidation in Mullet and Bluefish Muscle Tissues." A brief report covering the changes that occur in the fats of these fish during refrigerated storage as measured by several different methods for measuring lipid oxidation/rancidity. (Jeanne Joseph.)

5) "Handling Systems—Refriger-

ated and Chilled Seawater Holding.” The results of several laboratory trials are presented in this brief report on the comparison of ice, refrigerated sea water, and chilled sea water as systems for holding fish. (Robert Ernst.)

6) “Ciguatera Fish Poisoning.” Ciguatera may result from eating semi-tropical reef fishes containing a powerful, naturally occurring poison, ciguatoxin. The report provides background information on the illness and how NMFS and other research groups

are dealing with the problem. (Tom Higerd.)

7) “Enteric Viruses in Shellfish.” Enteric viruses present a potential human health problem and a threat to the well-being of the industry. The report provides a brief description of the approach by NMFS to develop and promote new methods for detecting and measuring viral contamination. (Gary Richards.)

If information is desired on fisheries utilization topics not dealt

with in one of the above recently completed reports, industry members are encouraged to contact the Charleston Laboratory to outline their needs, since a variety of other research is completed or in progress. In addition, the Laboratory has library and computer access to the results of other investigators working on the utilization and development of our marine resources.

Harry L. Seagran, Laboratory Director

Atlantic Bluefin Tuna Quota Increased for 1983

Allen E. Peterson, Jr., Director, Northeast Region of the National Marine Fisheries Service, has announced that during the special meeting of the International Commission for the Conservation of Atlantic Tunas held in Madeira Island, Portugal, in mid-November, the Commission decided to continue conservation measures for bluefin tuna in the western Atlantic. However, the catch limit will be raised from 1,160 t in 1982 to 2,660 t in 1983 to allow for adequate scientific monitoring of the stock. The U.S. share of the catch will increase from 605 t to 1,387.3 t. The shares for Canada and Japan will be 573.3 t and 699.4 t, respectively.

Concern for the continued low level of abundance of small bluefin tuna also resulted in a decision to limit the catch of bluefin smaller than 120 cm in length to be no more than 15 percent by weight of the total catch in the western Atlantic. During 1983, there will be no directed fishery in spawning areas such as the Gulf of Mexico.

Virtual population analyses, which were improved since the 1981 meeting, were used in two different papers which produced some differing results in estimating the population of younger and older fish. The scientists were unable to agree at what catch level a decline in the population will occur. One view was that juvenile

levels are 21 percent of the 1960 level, with a further decline likely in adult abundance. The other view was that spawning biomass and potential will increase until 1983 with a decreasing trend thereafter. The scientists believed that the 1982 catches were insufficient to monitor the stock but concluded that the weight of evidence suggests that the catch levels kept should be conservative.

In the eastern Atlantic, the catch of bluefin will continue to be limited to recent mortality levels and the minimum size limit of 64 kg in weight will continue to apply to the entire Atlantic.

The Commission also reviewed the status of all highly migratory species in the Atlantic, such as yellowfin tuna, skipjack tuna, albacore tuna, bigeye tuna, and billfishes. Several areas of concern were noted and the Commission agreed to increase scientific monitoring of these stocks to ensure that timely conservation measures may be implemented should they be called for in the future.

Fish Silage in Aquaculture Diets

Fish silage is a product made from whole fish or fish waste that is liquefied by the action of endogenous fish enzymes in the presence of added acid. Preserving the fish processing waste by ensiling with acids is one possible way to convert the waste ma-

terial into a usable feed commodity, reports the Northwest and Alaska Fisheries Center's Utilization Research Division.

Economic studies have indicated that the greatest potential large-volume use for fish silage is as a dry product that can be used in animal diets as a replacement of fish meal. Silage can be dried “as-is” or combined with other commodities, such as soybean meal and feather meal, and co-dried.

Feeding trials with rainbow trout using diets containing various dry silage products have shown that fish silage has a place in practical fish diets. Growth of fish fed diets containing silage co-dried with soybean meal and feather meal has been equal to that of fish fed a diet containing fish meal co-dried with soybean and feather meals. Other studies have shown that neutralization of silage made with sulfuric acid with calcium hydroxide is preferable to neutralization with sodium hydroxide or to not neutralizing the silage.

Growth of fish was found to be affected by the degree of liquefaction of the silage. Silage that is partially liquefied and still contains intact protein is preferable to silage that is fully liquefied and contains a larger proportion of free amino acids and small peptide fragments. Further work is planned to determine how to increase the nutritional value of feed ingredients made from fisheries byproducts.

Ronald W. Hardy