United States Department of the Interior, Fred Seaton, Secretary
Fish and Wildlife Service, John L. Farley, Director

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FISHERY TECHNOLOGY ABSTRACT CARD SYSTEM

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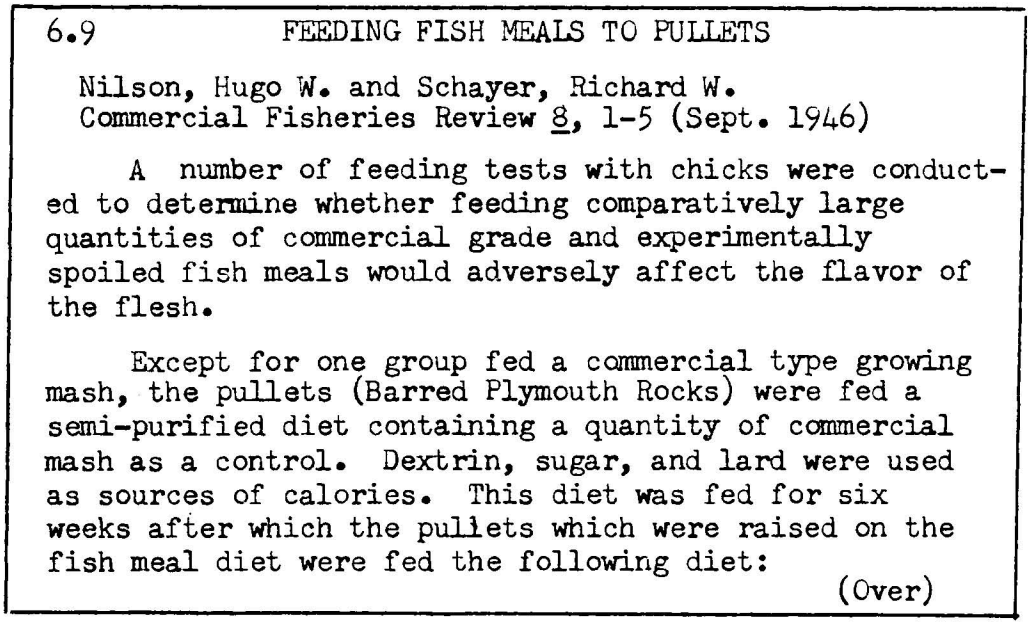
Since 1943, the Seattle Fishery Technological Laboratory has maintained a comprehensive card file of abstracts from articles appearing in the current literature pertaining to fishery technology. This file was set up to aid in answering the numerous inquiries received and to provide bibliographic information relating to research at the four Fish and Wildlife Service technological laboratories.

Sources of information being abstracted consist of about 70 periodicals dealing with fishery, food, general scientific, and technical subjects, and include Chemical Abstracts from January 1943 to the present. In addition to the material accumulated during this period, a miscellaneous group of abstract cards covering a portion of this field, from 1930 to 1943, is included. About 19,000 cards are on file at present. Since January 1948, the abstracts have been published in the monthly periodical, Commercial Fisheries Abstracts.

Information is recorded on a standard 3 x 5 inch card, and a code number appropriate to the subject matter is placed in the upper left hand corner. Following on the same line, is the title of the article and underneath the title the authors are listed. The exact literature reference is cited below the listing of authors and is followed by the abstract. If necessary the abstract is continued on the reverse side of the card. Cross index cards are provided whenever the subject matter covers several fields. A typical card is shown in the accompanying illustration.



6.9 FEEDING FISH MEALS TO PULLETS

Nilson, Hugo W. and Schayer, Richard W.
Commercial Fisheries Review 8, 1-5 (Sept. 1946)

A number of feeding tests with chicks were conducted to determine whether feeding comparatively large quantities of commercial grade and experimentally spoiled fish meals would adversely affect the flavor of the flesh.

Except for one group fed a commercial type growing mash, the pullets (Barred Plymouth Rocks) were fed a semi-purified diet containing a quantity of commercial mash as a control. Dextrin, sugar, and lard were used as sources of calories. This diet was fed for six weeks after which the pullets which were raised on the fish meal diet were fed the following diet:

(Over)

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)

Since the value of any such abstract card file is limited by the ability to find the cards once they have been filed, considerable thought has been given to setting up a system for classifying the cards according to the subject matter. The one adopted is similar to the Dewey Decimal system in principal, but the entire range of values 0-9 was adapted to fishery technology and related subjects. A brief resume of the system follows:

0. General and theoretical--scientific and technical material not specifically concerning fish or the fisheries but pertinent to them.

1. Fish by species--description of fisheries by species and by geographical areas. Cross references to all cards by species are included.

2. Fresh fish--fish spoilage; methods of handling at sea--gear, vessels, etc.; handling fresh fish ashore; transportation; marketing; fish cookery; nutritive value.

3. Preserved fish--preservatives, frozen fish, canned, smoked, salted, and dried fish.

4. Oils--structure, chemical and physical properties, decomposition, rancidity, antioxidants, marketing, utilization, and nutrition.

5. Vitamins--chemistry and therapy, arranged according to the different vitamins.

6. Manufacture of fishery byproducts--fish meals and oils, fish livers and liver oil, marine plant products, miscellaneous byproducts.

7. Analytical methods--methods of analysis of all kinds, including oils and vitamins.

8. Composition--composition of all fishery products, including vitamin content of fish oils.

9. Miscellaneous--ichthyology, fishery biology, conservation; economics and statistics; regulation and inspection; fishing concerns and agencies; persons in fisheries; books and periodicals; and fishery education.

In the use of this filing system, there are a few points which should be stressed. For example, class 7, Analytical Methods, has precedence over other classes if a card deals primarily with a description of a method of analysis. Thus a method for the analysis of vitamin A would go under 7 instead of under 5. In a like manner, a card which reported the vitamin A content of a specific fish oil would be classified under 8, Composition, rather than under 5, Vitamins. Ample cross-referencing is used if the subject matter of an abstract card fits under more than one heading.

Classifications 7.7 and 8.7, both specifications, can be confusing when the user is becoming acquainted with the system, but they need not be if it is always kept in mind that 7.7 refers to the analytical procedures used to obtain the data found in 8.7.

As with all rules, there are exceptions to the above. One major exception is fish oils. Because oils constitute such an important field of investigation at this laboratory, they are given a complete section to themselves. The sub-classifications of class 4, Oils, cover many of the various subjects which would otherwise come under classes 7 or 8. 7.53 refers only to methods of determining the amount of oil in various products and not to analyses of the oil constituents; these come under 4.11. Cards on the fat metabolism of fish are arbitrarily placed in 8.53 A certain amount of practice and judgment is necessary in order to be consistent in the classification of the abstract cards by this system.

Because several other fishery technological laboratories have expressed interest in this system and have considered adopting it for their own use, the following complete outline is given of the system as it is used in this laboratory.

SUBJECT HEADINGS OF CARD FILE

0. General

0.1 Apparatus and Equipment. (Apparatus and equipment classified here have general use in any of hundreds of procedures. Analytical apparatus for a specific use should be classified under the appropriate heading in 7. Plant equipment for a specific use should be classified under the appropriate heading in 2, 3, or 6.)

0.11 Laboratory (Includes all equipment used in analytical chemistry.)

0.110 General (Includes the laboratory and its equipment.)

0.111 Laboratory Arts (Includes cleaning, sealing, glass blowing.)

0.112 Optical Equipment (Includes color measuring devices, spectrophotometers, photographic equipment, microfilm readers, microscopes and accessories, and ultraviolet lamps.)

0.113 Heat (Includes temperature measuring equipment, constant temperature baths, thermo-regulators, heaters, and drying ovens.)

0.114 Electrical (Includes motors, voltage regulators, galvanometers, pH meters, and electrometric titration apparatus.)

0.115 Grinding and Agitation (Includes grinders, stirrers, and shakers.)

0.116 Filtration and Pumps (Includes filter paper and chromatographic columns.)

0.117 Distillation and Extraction (Includes molecular stills and apparatus for laboratory distillation, fat extraction, and lyophilization.)

0.118 Laboratory Instruments (Includes balances, moisture testers, and miscellaneous instruments.)

0.119 Miscellaneous (Includes glassware, clamps, and miscellaneous small equipment.)

0.12 Plant

0.2 General Physical Chemistry; Physics (Includes mathematics and statistics.)

0.3 Organic and Biochemistry

0.30 General Organic

0.31 Oil Constituents (Includes selachyl and batyl alcohol and sterols.) (Theoretical, here; practical and manufacturing, 6.4; analysis, 7.594; composition, 8.59).

0.32 Protein and Amino Acids (Theoretical, here; practical and manufacturing, 6.61 or 6.64; analysis, 7.51 or 7.52; composition, 8.51).

0.320 General

0.321 Protein

0.322 Amino Acids

0.33 Protein Compounds (Includes sugar-protein, sugar-amino acids, formaldehyde-protein, fatty acid-amino acid, browning reaction, and Maillard reaction.) (Theoretical and practical, here; analytical, 7.599; and composition, 8.59).

0.34 Miscellaneous Organic Compounds (Theoretical, here; practical and manufacturing, 6.59, 6.69, or 6.79; analytical, 7.599; composition, 8.59).

0.35 General Biochemistry

0.36 Muscle Metabolism (Includes carbohydrate metabolism glycogen, lactic acid, and phosphocreatine.) (Theoretical non-fish-muscle metabolism, here; fish-muscle metabolism, 2.02; analytical, see 7.59; composition, 8.59).

0.37 Bound Water (Includes theoretical, practical, analysis, and composition.)

0.38 Enzymes (Theoretical fish enzymatic activity, here; autolytic spoilage in fish, 2.03; fat-splitting enzymes, 4.4; practical and manufacturing, 6.71; analytical, 7.591; composition, 8.59).

0.39 Miscellaneous Biochemistry (Includes insulin) (Theoretical, here; practical, 6.72).

0.4 Medicine and Biology

0.5 Bacteriology (Theoretical, here--deals primarily with identification of species; bacterial spoilage of fish--2.01; analytical, 7.86; composition, 8.8).

0.6 Food Technology (Includes review articles on fishery technology and articles on food technology that do not fit in elsewhere.)

0.7 Nutrition (Theoretical, here; fresh fish, 2.9; frozen fish, 3.29; canned fish, 3.39; oils, 4.9; vitamins, section 5; meals, 6.19; fish livers 6.29).

0.8 Engineering (Includes both the equipment and the process for making ice used in the storage of fresh fish.)

0.9 Miscellaneous

1. Fish (Includes descriptions of fishing industries.)

1.0 Geographical Distribution of Fishes (An article such as "Norwegian Shrimp Canning" would be classified under Canning with a cross reference to Norway and to Shrimp. An article on "Norwegian Fish" would be classified under Norway. An article on "Norwegian Canning" would be classified under Canned Fish, with a cross reference to Norway.)

1.00 General

1.01 World Fisheries

1.011 North America (Includes the United States as a whole.)

1.0111 Canada

1.01110 General

1.01111 East and North Coast

1.01112 Inland

1.01113 West Coast

1.0112 Alaska and U. S. Territories (Includes Pacific Oceanic Fisheries Investigations.)

1.0113 Pacific Northwest

1.0114 California

1.0115 New England

1.0116 Middle and South Atlantic

1.0117 Gulf

1.0118 Inland

1.0119 Miscellaneous North America (Includes Caribbean area and Greenland.)

1.012 Central America and Mexico

1.013 South America

1.014 Europe

1.0140 Europe, General

1.0141 Norway

1.0142 Denmark

1.0143 Iceland

1.0144 Sweden, Baltic States, Finland, and Poland

1.0145 USSR

1.0146 United Kingdom and Eire

1.0147 Germany, Netherlands, Belgium

1.0148 France, Spain, Portugal

1.0149 Italy, Balkans, Miscellaneous

1.015 Asia

1.0150 General

1.0151 Ceylon, India, Pakistan

1.01510 General

1.01511 Ceylon

1.01512 India

1.01513 Pakistan

1.0152 China

1.0153 Indonesia (Includes Borneo--Kalimantan, Sarawak, and N. Borneo; Celebes; Java; and Sumatra.)

1.0154 Japan

1.0155 Korea

1.0156 Near East (Includes Iran, Israel, and Turkey.)

1.0157 Philippines

1.0158 Southeast Asia (Includes Burma, Cambodia, Malayan Federation, Thailand, and Viet Nam.)

1.0159 Miscellaneous (U.S.S.R. goes under 1.0145.)

1.016 Africa

1.0160 General

1.0161 North Africa (Includes Nigeria, Gold Coast and Samoliland.)

1.0162 South Africa (Includes French Equatorial Africa, Kenya, and Madagascar.)

1.017 Australia and New Zealand

1.018 South Pacific (Includes New Guinea.)

1.019 Miscellaneous (Pacific Oceanic Fisheries Investigation articles go under 1.0112.)

1.1 Mackerel and Tuna

1.10 General

1.11 Mackerel

1.12 Tuna

1.120 General

Note: Corresponding scientific names for the various fishes will be found in the glossary of Fishery Statistics of the United States--1953 by A. W. Anderson and E. A. Power (Statistical Digest No. 36, Fish and Wildlife Service).

1.121 Albacore

1.122 Bluefin

1.123 Bonito

1.124 Little

1.125 Skipjack

1.126 Yellowfin

1.129 Miscellaneous

1.19 Miscellaneous (Includes cigarfish, crevalle, and pompano.)

1.2 Herring Family

1.20 General

1.21 Anchovy

1.22 Herring

1.23 Menhaden

1.24 Pilchard (Sardine)

1.25 Shad

1.26 Smelt

1.29 Miscellaneous

1.3 Salmons

1.30 General

1.31 Chinook or King (tyee, spring, quinnat) (Oncorhynchus tshawytscha).

1.32 Red or Sockeye (blueback) (Oncorhynchus nerka).

1.33 Silver or Coho (Oncorhynchus kisutch).

1.34 Pink (humpback) (Oncorhynchus gorbuscha).

1.35 Chum or Keta (fall, dog) (Oncorhynchus keta).

1.36 Atlantic Salmon (Salmo salar)

1.37 Trouts (Includes steelhead (Salmo gairdnerii)).

1.4 Rockfish (Includes cabezone, ocean perch--rosefish, redfish, red perch--rock bass, and snapper.)

1.5 Cod Family

1.50 General

1.51 Cod

1.52 Haddock

1.53 Hake

1.54 Lingcod

1.55 Pollock

1.56 Sablefish

1.57 Whiting

1.59 Miscellaneous

1.6 Flatfishes

1.60 General

1.61 Halibut

1.69 Miscellaneous (Includes gray sole, lemon sole, and flounder--dab, blackback, yellowtail, and California halibut.)

1.7 Sharks

1.70 General

1.71 Grayfish (dogfish)

1.72 Soupfin

1.79 Miscellaneous (Includes ratfish and skate.)

1.8 Shellfish

1.80 General

1.81 Oysters

1.82 Clams

1.83 Abalone

1.84 Scallops

1.85 Shrimp

1.86 Crab

1.87 Lobster

1.88 Mussels

1.89 Miscellaneous Shellfish (Includes crawfish, conch, limpet, mussel, octopus, periwinkle, sea urchin, snail, squid, starfish, and trepang.)

1.9 Miscellaneous Species (Includes angelfish, anglerfish, barracuda, butterfish, cabio, cabrilla, corbina, croaker, drum, eel, flying fish, gizzard shad, goosefish, grouper, grunt, harvestfish, hogfish, jewfish, john dory, kingfish, marlin, mojarra, mullet, ocean pout, perch, permit, pinfish, plankton, porgy, rudderfish, sand perch, sculpin, sculp, sea bass, sea catfish, sea robin, sea trout, sheepshead, silver perch, snook, spot, striped bass, sturgeon, surffish, swellfish, swordfish, tautog, tilefish, triggerfish, wahoo, warsaw, wolffish, and zooplankton.) (Sponges go in 6.3.)

1.92 Fresh-water Species (Includes black bass, blue pike, bowfin, buffalofish, burbot, carp, catfish, chub, cisco, crappie, garfish, goldfish, lake trout, lamprey, launce, minnow, paddlefish, pickeral, pike, roach, sauger, sheepshead, silverside, squawfish, sucker, sunfish, white bass, whitefish, yellow perch, and yellow pike.)

1.93 Amphibians and Reptiles (Includes alligator, frog, and turtle.)

1.95 Marine Mammals

1.950 General

1.951 Seal

1.952 Sea Lion

1.953 Whale

1.959 Miscellaneous

2. Fresh Fish (If state of fish is not mentioned or implied, or if several states are mentioned equally, classify under fresh fish.)

2.0 Fresh Fish, General

2.00 Spoilage of Fish, General

2.01 Bacterial Spoilage (Includes hydrogen sulfide and other spoilage products.) (Practical—spoilage—here; theoretical—primarily identification of species—0.5; analytical, 7.85; composition, 8.8) (Volatile base and volatile acid-theoretical and practical, here; analytical, 7.81 and 7.82; composition, 8.8). (Preservatives go under 3.12.)

2.02 Rigor Lactic Acid, Glycogen, pH (Fish-muscle metabolism, here; non-fish-muscle metabolism, 0.36; analytical: lactic acid, 7.598: glycogen, 7.599: pH 7.3 or 7.84; composition in corresponding categories in 8).

2.03 Enzymatic Spoilage (Enzymatic spoilage in fish, here; non-fish enzymatic activity, 0.38; fat-splitting enzymes, 4.4; practical and manufacturing, 6.71; analytical, 7.591; composition 8.59).

2.05 Pathogens (Includes food poisoning by pathogens and their products, particularly botulism, staphylococcus, salmonella, and streptococcus food poisoning.) (Shellfish poisoning attributed to the toxic plankton animal, Gonyaulax catenella, go in 2.9) (All aspects of sanitation go under 2.3, except antiseptics, which go under 3.18).

2.06 New Fish Products for Human Food (These are fresh-fish products. New preserved-fish products go in the appropriate headings under 3.)

2.08 Icing and Cooling of Fish (Reserved for World Fishery Abstract use only.)

2.1 Handling at Sea

2.11 Apparatus, Boats and Gear

2.110 General

2.111 Rope and Netting (Includes identity, specifications, gear preservation, and steel cable.)

2.112 Gear (Includes bait and construction of nets, crab pots, and trawls.)

2.1120 Gear

2.1121 Trawls

2.1122 Trolling, Gurdies

2.1123 Long Lines, Hand Lines

2.1124 Trap Nets (Includes salmon traps.)

2.1125 Purse Seines (Includes lampara nets, purse-seine table and rollers, and drum seines.)

2.1126 Gill Nets and Gill-Net Rollers

2.1127 Bait (Includes lures.) (Bait tanks go under 2.115.)

2.1128 Dredges, Rakes, Pots (Includes crab and lobster traps.)

2.1129 Miscellaneous (Includes harpoons.)

2.113 Corrosion Resistance (Includes antifouling paints and devices and disinfection of fishing-vessel holds.)

2.114 Mechanical Equipment (Includes heating and ventilating, engines and batteries, refrigeration, and all deck gear, except as noted under 2.112) (Refrigeration includes all cooling equipment. If equipment is used to freeze fish, place under 2.118.)

2.115 Design of Vessels (Includes stabilizers, wind breaks, bait tanks, shape of bow, and theory of design.) (This section is distinguished from 2.117 by the emphasis here on design and the emphasis in 2.117 on mere description.)

2.116 Instruments (Includes fathometer, echo sounder, radio, and fish finder.)

2.117 Description of Vessels (Includes method of construction, and materials of construction, and tuna clippers; however, anything on freezing fish at sea goes under 2.118.)

2.118 Floating Factory Ships (Includes floating canneries and freezer ships.) (Everything on the actual freezing of fish at sea goes here. However, if the article does not deal with the actual freezing of the fish at sea—brine-freezing, for example--the article goes under 3.234.)

2.119 Miscellaneous (Includes launching life rafts.)

2.12 Exploratory Fishing

2.14 Fishing Methods

2.140 General

2.141 Airplane spotting

2.142 Chemical

2.143 Electrical (If fish are being guided for conservation, place in 9.17.)

2.144 Lights

2.145 Mechanical (Includes fish pumps.)

2.146 Sound

2.147 Traditional and Modified Traditional

2.1470 General

2.1471 Trawling

2.1472 Trolling

2.1473 Long Lining

2.1474 Trap Fishing

2.1475 Purse Seining

2.1476 Gill Netting

2.1477 Pole and Line Fishing (Includes bait fishing.)

2.1478 Dredging

2.1479 Miscellaneous

2.148 Weather

2.149 Miscellaneous

2.15 Handling Methods for Fish Aboard Vessel (Includes dressing fish, icing fish, use of pen-wall materials and pen boards, use of chilled-brine tanks to hold fresh fish, and use of salt-water ice. Any mechanical equipment required for this use goes under 2.114; anything on freezing goes under 2.118.)

2.19 Changes in Fish on Board Boat (Topics dealing with antiseptic ice go under 3.17.)

2.2 Wharfs (Includes inspection of fish and all handling ashore up to processing.)

2.3 Processing (Dressing, Cutting) (Includes sanitation and any required equipment. Includes insecticides and the use of them. Antiseptics, however, go under 3.18.)

2.4 Storage

2.40 General

2.41 Shipping Containers

2.43 Packaging (Antiseptic wrappers go under 3.19.) (If the card deals equally with both fresh and frozen fish or if the state of the fish is not mentioned or implied, the card goes under 3.238. This category is the only one in which preserved fish is favored over fresh fish.)

2.5 Transportation

2.6 Marketing (Includes advertising, financing, marketing, insurance of vessels, fresh-fish plants, and personnel.)

2.8 Cookery (Includes all types of home or restaurant cooking of fish products, even if frozen or canned or otherwise preserved products are being cooked.)

2.9 Nutritive Value and Toxicity (Includes fish poisoning, as by South Sea fish, histamine poisoning, and Gonyaulax catenella poisoning.) (Food poisoning by pathogens and their products goes under 2.05.)

3. Preserved Fish

3.1 Preservatives

3.10 General (Antioxidants go under 4.61.)

3.11 Preservative Compounds (Includes theoretical studies without regard to use on fish or to food toxicity.)

3.12 Food Preservatives (Includes ordinary chemical solids or solutions for food preservation, and antibiotics.)

3.13 Gaseous Preservatives (Includes carbon dioxide, ozone.)

3.14 Preservatives for Byproducts (Fish Livers, Fish Meal.)

3.15 Catodyn (Silver; electrolytic)

3.17 Antiseptic Ice (Includes antiseptic sea water.)

3.18 Antiseptics for equipment (Includes materials for plant sanitation, deodorizing.) (Plant sanitation methods go under 2.3.)

3.19 Miscellaneous (Antiseptic wrappers, germicidal rays, radio frequency fields, and supersonic waves.)

3.2 Frozen Fish

3.23 Processing

3.230 General (Includes fish frozen alive in ice)

3.231 Apparatus and Equipment (Includes insulating materials and cold-storage buildings.) (Railroad refrigerator cars goes under 3.26.) (Equipment for freezing fish at sea goes under 2.118.)

3.234 Freezing

3.2340 General

3.2341 Air-blast Freezing

3.2342 Brine Freezing (Includes all liquid-contact freezing.) (Actual use on board ship would place the card in 2.118.)

3.2343 Sharp Freezing (Includes all freezing in still air.)

3.2344 Pressure Plate Freezing (Includes all freezing by means of movable plates and belts with pressure contact.)

3.2345 Theoretical, Applied, and Economics

3.2349 Miscellaneous

3.235 Miscellaneous Precooked Products (Includes tuna pies, creamed fish, fish soups, chowders, miscellaneous casserole dishes, and fish cakes.) (Home cooking goes under 2.8.)

3.236 Breaded Shellfish (Home cooking goes under 2.8.)

3.237 Fish Sticks (Home cooking goes under 2.8.)

3.238 Packaging

3.2380 General

3.2381 Glazes

3.2382 Films and Wraps

3.2383 Packages and Cartons (Includes metal cans.)

3.2384 Overwraps and Labeling

3.2385 Theoretical, Practical, and Economics

3.2386 Wrapping Machines and Other Devices

3.2387 Shipping Containers

3.2389 Miscellaneous

3.239 Changes Caused by Freezing (Includes change by brine-freezing and theoretical studies such as changes in actomyosin.)

3.24 Storage

3.249 Changes Caused by Storage

3.2490 General

3.2491 Color

3.2492 Desiccation

3.2493 Flavor (Includes rancidity and free fatty acid.)

3.2494 Microorganisms

3.2495 Protein Changes (Includes texture.)

3.2496 Theoretical, Practical, and Economics

3.2497 Time and Temperature

3.2499 Miscellaneous

3.25 Transportation

3.26 Marketing (Includes freezing preservation of sport fishermen's catch, advertising, financing, insurance pertaining to the frozen-fish industry, cold-storage lockers, refrigerated cargo containers, transportation, and railway refrigerator cars.) (Cold-storage buildings goes under 3.231.)

3.29 Nutritive Value

3.3 Canned Fish (An article on "Shrimp Canning" is classified here, with a cross reference to shrimp. An article on "Norwegian Canning Methods" is classified here with a cross reference to Norway.)

3.30 General (Includes bacteriological studies on spoilage of canned fish.)

3.33 Processing (Includes pasteurization.)

3.330 General

3.331 Canning Mackerel and Tuna

3.332 Canning Herring

3.333 Canning Salmon

3.334 Canning Shellfish

3.3340 General

3.3341 Oysters

3.3342 Clams

3.3343 Shrimp

3.3344 Crab

3.3349 Miscellaneous

3.335 Specialty Products and Miscellaneous Species of Fish

3.336 Canning Techniques and Machines (Includes salt and monosodium glutamate.)

3.337 Theoretical Aspects, Economic

3.338 Containers

3.339 Miscellaneous

3.39 Nutritive Value and Toxicity (Includes botulinus poisoning.)

3.4 Smoked

3.5 Salted (Includes drying if it is part of the salting operation.)

3.6 Dehydrated (Fish Dried by the Use of Machinery.)

3.60 General

3.61 Apparatus

3.63 Processing

3.64 Storage

3.68 Cooking

3.7 Dried (Fish Dried Naturally.) (If machinery is used, place under 3.6.)

3.8 Pickled (Includes spiced fish.)

3.9 Miscellaneous (Includes extracts, fermented products, and museum preservation of fish.)

4. Oils

4.1 Structure (Unaltered Fatty Acids and Glycerol in Naturally Occurring Oils).

4.10 General

4.11 Analytical (Methods of determining structure and equipment used) (Analysis of the amount of oil in fish and other materials goes under 7.53; analysis of oil for free fatty acid goes under 7.773.) (This category of 4.11 corresponds to 7.)

4.12 Theoretical (Unaltered fatty acids in pure state; adsorption curves) (Practical under 4.7, 4.8, and 4.9; manufacturing under 6.4).

4.13 Body Oils from Fishes (Primarily composition; corresponds to section 8. Analytical goes in 4.11.)

4.14 Body Oils from Mammals (Primarily composition; corresponds to section 8. Analytical goes in 4.11.)

4.15 Liver Oils (Primarily composition; corresponds to section 8. Analytical goes in 4.11. However, analysis of the amount of oil in liver goes under 7.53.)

4.19 Miscellaneous (Includes oil from fish eggs, mollusks, and reptiles such as alligators.) (Primarily composition; corresponds to section 8; analytical goes in 4.11.)

4.2 Chemical Properties (Composition and reaction of oils, glycerol, and fatty acids that have been chemically treated or allowed to change from their natural state.) (Includes the laboratory research. Pilot-plant or commercial production places the subject in the 6 category—6.138, if oil, and 6.4, if fatty acids or glycerol.) (Theoretical, analytical, and composition here. Practical, 4.7 and 4.8.)

4.20 General

4.21 Oxidation (This is controlled oxidation at the laboratory level. Anything on rancidity goes under 4.5.)

4.22 Hydrogenation

4.23 Hydrolysis

4.29 Miscellaneous (Includes polymerization, isomerization, and deacidification by molecular distillation.)

4.3 Physical Properties (Includes solubility of oils in solvents, viscosity of oils, surface tension, stability to cold (stearine). It does not include such physical constants as refractive index or specific gravity. They are to be filed under 8.7, Specifications, if the article is mainly a report on these values for oils, or under 7.779 if it is mainly on methods for determining them.)

4.4 Decomposition (Decomposition includes hydrolysis of oils by bacteria or enzymes and all types of spoilage except rancidity.) (Chemical hydrolysis, at the laboratory level, goes under 4.23; at the production level, it goes under 6.138, if oil, or 6.4, if fatty acid.)

4.5 Rancidity (Includes fatty acids.) (Theoretical and practical,here. Analytical,7.87.)

4.6 Antioxidants (Theoretical and practical, here; analytical,7.595; composition, 8.59.)

4.60 Antioxidants, General

4.61 Application of Antioxidants to Fish

4.62 Application of Antioxidants to Fish Oil

4.63 Application of Antioxidants to Vitamin A

4.64 Application of Antioxidants to Miscellaneous Foods and Oils

4.65 Toxicity of Antioxidants

4.69 Miscellaneous

4.7 Production and Marketing (Includes advertising, statistics, and economics concerning oil, liver oil, fatty acids, glycerol, unsaponifiable constituents other than vitamins, and their chemically altered products.) (Meal or meal and oil statistics go under 6.10.)

4.8 Utilization (Includes oil, liver oil, fatty acids, unsaponifiable constituents other than vitamins, and their chemically altered products.)

4.80 General

4.81 Human Food

4.82 Animal Food

4.83 Paint and Varnish

4.84 Waterproofing

4.85 Lubricating

4.86 Leather

4.89 Miscellaneous

4.9 Nutrition (Includes oil, fatty acids, unsaponifiable constituents other than vitamins, and their chemically altered products.) (Includes liver oil if it has been removed from liver.)

4.90 General (Includes fish oil in poultry rations.)

4.91 Fatty acids

4.92 Toxic effects (Includes encephalomalacia in the chick.)

4.99 Miscellaneous

5. Vitamins (Chemistry and Therapy) (The detached vitamins). (Theoretical, here; antioxidants, 4.6; analytical, 7.6; composition, 8.6.)

5.0 General

5.1 Vitamin A (Theoretical, here; practical, including synthetic vitamin A, is classified with liver oil.)

5.11 Chemistry

5.110 Vitamin A Chemistry, General

5.111 Forms of Vitamin A (Includes Vitamin A_2, and other isomers)

5.112 Stability (Antioxidants go under 4.63.)

5.119 Miscellaneous

5.12 Therapy

5.120 Vitamin A Therapy, General

5.121 Vitamin A and Carotene

5.122 Function of Vitamin A

5.123 Relation to Other Vitamins (Includes tocopherols and ascorbic acid.)

5.124 Relation to Other Diet Components (Includes oils.)

5.125 Requirements of Man

5.126 Requirements of the Rat

5.127 Requirements of Poultry

5.128 Requirements of Other Animals

5.129 Miscellaneous (Includes vitamin A toxicity; but if in liver oil, place in 4.92; if in liver, place in 6.29.)

5.2 Thiamin (Vitamin B_1)

5.3 Riboflavin (Vitamin B_2 and Vitamin G.)

5.4 Miscellaneous B Complex (Includes biotin, choline, folic acid, niacin, nicotinic acid, and pyridoxine.)

5.41 Vitamin B_{12} and Animal Protein Factor (Includes cyanocobalamin) (Theoretical, here; nutritive value in meal and solubles, 6.192; analytical, 7.641; composition, 8.64).

5.42 Protein Utilization Factors (Includes antibiotics and unknown growth factors.) (Theoretical, here; nutritive value in meal and solubles, 6.193; analytical, 7.642; composition, 8.64).

5.5 Vitamin C (Ascorbic Acid)

5.6 Vitamin D

5.7 Vitamin E (Tocopherol)

5.9 Miscellaneous (Includes vitamin K.)

6. Manufacture of Byproducts

6.1 Fish Meal, Oil, and Solubles

6.10 General (Economics and statistics relating to meals, solubles or to oils and meal, go here; to oil only, go in 4.7.)

6.13 Processing

6.130 General (ncludes cards covering several phases--especially processing meal and oil as one operation.)

6.131 Machinery

6.132 Manufacture of Meal (If meal and oil are discussed equally, place in 6.130.)

6.133 Manufacture of Oil (If meal and oil are discussed equally, place in 6.130.) (Includes solvent extraction.)

6.134 Drying of Meal (Specifically applies to drying of meal; 6.132 applies to the whole process of meal manufacture.)

6.135 Deodorizing (Includes oil and plants.)

6.136 Decolorizing

6.137 Refining (Includes refining not under other headings; filtering, clarifying, removing stearines, crystallization, and fractionation.)

6.138 Chemical Alteration (Includes hydrogenation, sulfonation, chlorination.) (This category is for the chemical alteration of the oil only. The manufacture of other constituents in fish oils and the chemical alteration of these constituents come under 6.4.)

6.139 Changes Occurring in Meal during Processing

6.14 Storage of Meal

6.15 Fish Solubles (If card deals equally with both meal and solubles, place under meal. In case of doubt, resolve in favor of meal.)

6.18 Fish Meal and Solubles for Fertilizer

6.19 Nutritive Value of Meal and Solubles (Nutritive value of oil and fatty acids go in 4.9.)

6.190 Nutritive Value of Meal and Solubles, General

6.191 Digestibility

6.192 Animal Protein Factor and Vitamin B_{12} (Nutritive value in meal and solubles, here; theoretical 5.41; analytical, 7.641; composition, 8.64).

6.193 Protein Utilization Factors (Includes antibiotics and unknown growth factors.) (Nutritive value in meal and solubles, here; theoretical, 5.42; analytical, 7.642; composition, 8.64).

6.194 Other Vitamins

6.195 Protein and Amino Acids (Includes discussions on the protein and amino acid requirements of poultry and swine.)

6.197 Minerals

6.199 Miscellaneous (Includes effect on flavor of animal meat in feeding meal or solubles to the animal.)

6.2 Fish Livers and Liver Oils

6.23 Processing

6.230 General

6.231 Equipment

6.232 Grinding

6.233 Digestion

6.2331 Steaming

6.2332 Alkali Process

6.2333 Enzyme Process

6.2334 Solvent Extraction

6.237 Refining and Concentration

6.24 Storage

6.249 Changes Occurring

6.29 Nutritive Value (If oil is separated from liver, place under 4.9.)

6.3 Marine Plant Products

6.30 General

6.31 Distribution and Life Habits (Seaweeds used specifically for production of agar, algin, or carrageenin are placed under 6.33, 6.34, or 6.35, respectively.) (Includes articles on the industry in various nations, such as in Scotland.)

6.32 Analysis and Composition (6.33, 6.34, and 6.35 take precedence.)

6.33 Agar (Includes all aspects: theoretical, practical, manufacturing, analytical, and composition.)

6.34 Algin (Includes all aspects: theoretical, practical, manufacturing, analytical, and composition.)

6.35 Carrageenin (Includes all aspects: theoretical, practical, manufacturing, analytical, and composition.)

6.36 Industrial and Pharmaceutical Uses (Potential or Actual) (6.33, 6.34, and 6.35 take precedence.)

6.37 Human and Animal Food (6.33, 6.34, and 6.35 take precedence.)

6.38 Sponges

6.39 Miscellaneous (Bibliographies go under 9.6.)

6.4 Chemical Products from Fish Oil (This category is for the pilot-plant development and manufacture of fatty acids and other constituents in oils and for the chemical alteration of these constituents. The chemical alteration of oil itself goes under 6.138. Laboratory scale development goes under 4.21.) (Practical under 4.7, 4.8, or 4.9)

6.5 Byproducts Other Than Meal and Oil Used for Food

6.50 General

6.51 Food for Hatchery Fish (Practical and manufacturing, here; theoretical, 9.14)

6.52 Food for Fur-Bearing Animals

6.53 Food for Pets

6.54 Food for Human Consumption (Includes caviar, fish paste.)

6.55 Food for Farm Animals

6.59 Miscellaneous

6.6 Nonedible and Pharmaceutical Byproducts Primarily from Flesh

6.60 General

6.61 Proteins (Practical and manufacturing, here; theoretical, 0.32; analytical, 7.51; composition, 8.51)

6.63 Hydrolysates

6.64 Amino Acids (Practical and manufacturing, here; theoretical, 0.32; analytical, 7.52; composition, 8.51)

6.69 Miscellaneous

6.7 Byproducts Primarily from Viscera

6.70 General

6.71 Enzymes (Manufacturing and practical here; theoretical 0.38; autolytic spoilage, 2.03; analytical, 7.591; composition, 8.59)

6.72 Miscellaneous Chemicals and Pharmaceuticals (Includes insulin.)

6.73 Ambergris and Perfume (Practical and manufacturing, here; analytical, 7.599; composition, 8.59)

6.79 Miscellaneous

6.8 Byproducts from Skin, Sounds, and Shell

6.80 General

6.81 Pearls

6.82 Manufactured Shell Products

6.83 Byproducts from Sounds (Isinglass)

6.84 Pearl Essence and Fish-Scale Products

6.85 Glue

6.86 Leather, Furs, and Fish-Skin Products

6.89 Miscellaneous

6.9 Miscellaneous

7. Analytical Methods

7.0 (Includes the development of the method as well as the actual method. If the card is primarily analytical and the data are presented merely to demonstrate the suitability of the method, place here. If the method is given simply to show how data were taken, place in 8. If the card deals with analysis or composition, sections 7 and 8 have precedence over all other sections, except 0.37, 4.11, 4.2 and 6.3.)

7.1 Theoretical

7.3 pH (Includes alkalinity of sea water. pH tests in quality control go under 7.84. All other tests go here.)

7.4 Inorganic

7.41 Ash

7.42 Specific Minerals (Cations)

7.43 Water (Analysis and composition of bound water go under 0.37.)

7.44 Nitrogen

7.45 Anions (Includes sulfur, phosphorous, arsenic.)

7.46 Halides

7.460 General

7.461 Chlorides (Includes analyses for salt.)

7.462 Iodides

7.463 Fluorides

7.464 Bromides

7.47 Gases

7.49 Miscellaneous

7.5 Organic

7.50 General

7.51 Protein (Includes protein digestibility, intact proteins, myoglobin, hemoglobin, myosin, actomyosin, and insulin.) (Analysis, here; theory, 0.32; practical and manufacturing, 6.61; composition, 8.51)

7.52 Amino Acids (Includes hydrolyzed proteins, amino acids, and group determinations such as Van Slyke.) (Analysis, here; theory, 0.32; practical and manufacturing, 6.64; composition, 8.51)

7.520 General

7.521 Titration of Groups (Includes Sorensen Formal titration, Van Slyke.)

7.522 Separation of Amino Acids (Includes paper chromatography of amino acids.)

7.523 Basic Amino Acids (Includes histidine, lysine, arginine, and separation of this group.)

7.524 Cystine and Methionine (Includes cysteine.)

7.525 Tyrosine and Tryptophane

7.529 Miscellaneous Amino Acids

7.53 Oil (This category gives the amount of oil to be found in fish, fish livers, and similar materials. Fatty acid analysis goes under 4.11 or 4.2, if chemically altered; free fatty acid analysis goes under 7.773.)

7.59 Miscellaneous Organic Analysis

7.590 General

7.591 Enzymes (Analytical, here; theory, 0.38; autolytic spoilage, 2.03; practical and manufacturing, 6.71; composition, 8.59)

7.592 Pigments

7.593 Tissue Constituents (Includes Phosphatides, creatine, anserine, and purines.)

7.594 Compounds Associated with Oil (Includes cholesterol.) (The individual constituents in the unsaponifiable fraction, analysis here; theory, 0.31; practical and manufacturing, 6.4; composition, 8.59; oil, 7.53)

7.595 Preservatives and Antioxidants (Includes hydroxybenzoic acid, gallic acid, tocopherols.)

7.596 Urea

7.597 Aldehydes (Includes formaldehyde, acetaldehyde.)

7.598 Organic Acids (Except those under above headings; lactic acid, lactates, uric acid.)

7.599 Miscellaneous (Includes sugar proteins: analytical, here; theoretical and practical, 0.33; composition, 8.59)

7.6 Vitamins

7.61 Vitamin A

7.610 Comparison of Methods

7.611 Ultraviolet

7.612 Fluorescent

7.613 Colorimetric

7.6131 Color Reactions

7.6132 Carr-Price (Includes antimony trichloride.)

7.6133 Modifications of Carr-Price

7.6139 Miscellaneous

7.614 Bioassay

7.62 Thiamin

7.63 Riboflavin

7.64 Vitamin B Complex

7.641 Vitamin B_{12} (Analytical, here; theoretical, 5.41; nutritive value in meal and solubles, 6.192; composition, 8.64)

7.642 Protein Utilization Factors (Includes antibiotics and unknown growth factors.) (Analytical, here; theoretical, 5.42; nutritive value in meal and solubles, 6.193; composition, 8.64)

7.65 Vitamin C

7.66 Vitamin D

7.67 Vitamin E

7.69 Miscellaneous

7.7 Specifications (Fishery products are often bought on specifications. This category includes the work done in drawing up these specifications.)

7.72 Fresh

7.73 Frozen

7.74 Canned

7.77 Oil

7.770 General

7.773 Free Fatty Acids (Analysis for free fatty acid in oil, here; analysis of separated fatty acid, 4.11; analysis of chemically altered fatty acid, 4.2; analysis of amount of oil in fish, 7.53)

7.775 Saponification and Unsaponification Numbers

7.777 Iodine Number

7.779 Miscellaneous (Includes physical properties of oil. See 4.3.)

7.8 Quality Control (This category primarily includes chemical tests for freshness, chemical tests for rancidity, and organoleptic tests for these factors. However, it includes all other factors related to quality. For example, organoleptic tests for seasoning and other consumer-acceptance tests go here.)

7.80 General (Includes organoleptic tests, developmental work on quality-control manuals, volatile reducing substances.)

7.81 Volatile Base

7.82 Volatile Acid

7.83 Sulfides

7.84 Electrometric (Includes pH and buffer capacity.) (pH tests for purposes other than quality control go under 7.3.)

7.85 Bacterial Count

7.86 Bacterial Flora

7.87 Rancidity (Theoretical and practical, 4.5; composition, 8.8)

7.871 Oxygen Adsorption

7.872 Peroxide

7.873 Kreis (Includes acetal of epihydrine aldehyde.)

7.874 Miscellaneous Aldehyde Tests

7.879 Miscellaneous Tests

7.89 Miscellaneous (Includes candling for worms, "drip" analyses, and tenderometer analyses.)

8. Composition (Significance of entries in 8 can be seen by considering corresponding entry in 7. See 7.0.)

8.0 Proximate Composition of Fish and Shellfish

8.3 pH

8.4 Inorganic (Includes sea water.)

8.42 Specific Minerals

8.43 Water

8.5 Organic

8.50 General

8.51 Protein and Amino Acids (Includes insulin.)

8.53 Oil

8.59 Miscellaneous

8.6 Vitamins

8.61 Vitamin A

8.610 General

8.612 Fresh Fish

8.615 Preserved Fish

8.617 Fish Oil

8.6170 Miscellaneous

8.6171 Mackerel and Tuna*

8.6172 Herring and Pilchard

8.6173 Salmon

8.6174 Rockfish

8.6175 Cod Family

8.6176 Flatfish

8.6177 Shark (Includes ratfish and skates.)

8.6179 Marine Mammals

8.64 Vitamin B Complex

8.65 Vitamin C (Ascorbic Acid)

8.66 Vitamin D

8.69 Miscellaneous

8.7 Specifications (After specifications have been developed as worked out in 7.7, the printed specifications go here.)

8.8 Quality Control (Includes data obtained by methods in 7.8. If data are mentioned merely to show suitability of method, card goes under 7.8; includes quality-control manuals.)

9. Miscellaneous

9.1 Ichthyology, Fish Culture, Biology (Analytical data on fish usually go under 8., with a cross reference here. If any doubt, favor 8.)

9.10 General

* See 1.1 for information on related species and on scientific names.

9.11 Oceanography

9.12 Life History and Ichthyology

9.125 Anatomy of Fishes (Includes scales.)

9.13 Metabolism

9.14 Feeding and Nutrition of Fishes (Theoretical, here; practical and manufacturing, 6.51)

9.15 Parasites, Diseases and Poisons

9.16 Fish Culture and Hatchery Practices

9.17 Conservation (Includes fish ladders, removal of obstructions, and use of electricity, light, and sound to guide fish. If for catching, however, place under 2.14.)

9.19 Miscellaneous (Includes pollution.)

9.2 Economics and Statistics (Economics and statistics relating to oils only go under 4.7; to meals only, 6.10; to meal and oil, 6.10.)

9.3 Regulations and Inspection (Includes international fishing regulations and Food and Drug regulations.) (Specifications and quality control--analytical, 7.7, 7.8; composition 8.7, or 8.8)

9.4 Fishing Concerns and Agencies

9.5 Persons in Fisheries

9.6 Books and Periodicals (Includes bibliographies.)

9.7 Fishery Education (Includes articles on how to write.)

An advantage of this abstract-card-file system is that it is geared for expansion. When the file is small and has only a few cards in it, only the major headings need be used; when any section becomes so large as to be unwieldy, it can be broken down into the appropriate sub-classifications. Thus the system need be no more complicated than is necessary to take care of its size at any given time.

AUXILIARY LIST TO AID IN LOCATING CODE NUMBERS

The following alphabetical list of subject headings shows the code numbers used for various common subjects. This auxiliary list is furnished as an aid in locating material classified by the abstract card system.

It should be pointed out that only the most important code numbers are given in this auxiliary list. For example, with abalone, the first subject listed, the only code number given is 1.83. Although articles dealing with the abalone fishery are listed under this code number in the subject headings of the card file, other articles mentioning abalone incidentally or treating some special phase of the subject might be given under many other code listings. Thus, articles dealing with the content of Vitamin B complex in fishery products, including abalone, would be given under 8.64, and those dealing with freshness would be listed under 7.8 or 8.8. The code numbers given in this list are therefore furnished as a guide and not as a complete reference.

Abalone	1.83
Advertising	2.6; 3.26; 3.30; 6.10; 4.7
African Fisheries	1.016
Agar	6.33
Alaskan Fisheries	1.0112
Algin	6.34
Alligators	1.93
Ambergris	6.73
Amino Acids	0.322; 6.64; 7.52; 8.51
Analytical Methods	0.11; 0.37; 4.11; 4.2; 6.3; 7(especially)
Anchovies	1.21
Antioxidants	4.6; 7.595; 8.59
Apparatus	0.1
Ascorbic Acid	3.23; 3.24; 5.5; 7.65; 8.65
Associations, Fishery	9.4
Asiatic Fisheries	1.015
Australian Fisheries	1.017
Autolysis	2.03
Bacteria	0.5; 2.01; 3.30; 7.86; 8.8
Bacterial Counts	2.01; 3.30; 7.86; 8.8
Bait	2.1127; 2.1477
Bass	1.9(sea); 1.92
Bibliographies	9.6
Biology, Fishery	9.1
Bloaters	1.2; 3.4
Boats	2.11; 2.115; 2.117; 2.118
Books	9.6
Brining	3.234; 3.239; 3.5; 3.8; 3.12
Buffalo Fish	1.92
Bullheads	1.9(sea); 1.92
Burbot	1.92
Byproducts	6.
Canadian Fisheries	1.0111
Canned fish	3.3; 7.74; 8.7
Cans	3.338
Carp	1.92

Caribbean Fisheries 1.0119
Catfish 1.92
Caviar 6.54
Chesapeake Bay Fisheries 1.0116
Chlorination 2.113; 2.3; 3.18
Chowder 2.8; 3.235
Chub 1.92
Clams 1.82
Cod 1.51
Cold Storage 2.40; 3.24
Color 0.112; 7.7; 7.8; 8.7; 8.8
Composition 0.37; 4.13; 4.14; 4.15; 4.19; 4.2; 6.3; 8(especially)
Conservation 9.17
Consumption 4.7; 6.10; 9.2(especially); 2.6; 3.26
Containers 2.41; 2.43; 3.19; 3.238; 3.26
Cookery, Fish 2.8; 3.235; 3.236; 3.237; 9.7
Cooperatives, Fishery 9.4
Crab 1.86
Crayfish 1.89
Croaker 1.9
Crustaceans 1.8
Curing 3.4; 3.5; 3.6; 3.7; 3.8

Dehydrated Fish 3.6; 3.7
Diet 2.8; 2.9; 3.235; 3.236; 3.237; 3.29; 3.39; 3.68; 4.81; 4.82; 4.9; 5; 6.19; 6.29; 6.33; 6.34; 6.35; 6.37; 6.5; 9.14
Dieases 9.15; 0.4; 0.5; 2.05
Dogfish 1.71
Dressing of Fish 2.15; 2.3; 3.23
Dried Fish 3.6; 3.7
Drip 3.239; 3.249: 7.89
Drum 1.9
Dryers 0.113; 0.117; 0.12; 3.6; 6.134; 6.15
Drying 3.6; 3.7; 6.134; 6.15

Echo Sounders 2.116
Economics 2.6; 3.2345; 3.2385; 3.2496; 3.26; 3.337; 4.7; 6.10; 6.3; 9.2
Eels 1.9; 1.92
Electrical Fish Guiding 9.17
Electrical Fishing 2.143
Employment 9.2
Enzymes 0.38; 2.03; 4.4; 6.71; 7.591; 8.59
Equipment 0.1; 0.2
European Fisheries 1.014
Exploratory Fishing 2.12

Factory Ships 2.118
Fertilizers, Fish 6.18
Fibers 2.111
Filleting 2.3; 3.23
Fillets 2.3; 3.23
Finnan Haddie 1.5; 3.4
Fish Cakes 2.8; 3.235; 3.5
Fish Culture 9.1
Fish Cookery 2.8
Fish Liver Oil 4.15; 4.8; 4.9; 6.2; 7.53
Fish Livers 6.2
Fish Meal 6.1
Fish Oil 4.0; 6.1; 6.2; 6.4; 7.53; 7.77; 8.53
Fish Paste 6.54
Fish Processing 2.3; 3.23
Fish Solubles 6.1; 6.130; 6.15; 6.18; 6.19
Fish Waste 6.0
Fisheries 1.0; 9.0
Fishery Biology 9.1
Fishery Byproducts 4.0; 6.0
Fishery Education 9.7
Fishery Industrial Products 4.0; 6.0; 6.6; 6.7; 6.8
Fishery Products 2.0; 3.0; 4.0; 6.0
Fishery Statistics 4.7; 6.10; 9.2
Fishery Technology 0.6; 2.0; 3.0; 4.0; 6.0; 7.7; 7.8; 8.7; 8.8
Fishing Agencies 9.4
Fishing Concerns 9.4
Fishing Equipment 2.11; 2.114; 2.116; 2.118; 2.14
Fishing Gear 2.11
Fishing Methods 2.14
Flatfish 1.6
Floating Canneries 2.118
Flounders 1.6
Food and Drug Act or Agency 9.3; 2.00; 3.1; 3.12; 4.65; 7.595; 7.7; 7.8; 8.7; 8.8
Food Technology 0.6
Freezer Ships 2.118
Freezers, Fish 3.231
Freezing of Fish 3.234
French Fisheries 1.0148
Fresh Fish 2.0
Freshness Tests 7.8; 8.8
Fresh-water Fisheries 1.92
Frogs 1.93
Frozen Fish 3.2
Frozen Storage of Fish 3.24
Fur Bearing Animals 1.95; 6.52
Fur Seals 1.95

Gear, Fishing 2.11
German Fisheries 1.0147
Glazing 3.238
Grayfish 1.71
Great Lakes Fisheries 1.0118; 1.92
Greenland Fisheries 1.0119
Groupers 1.9

Haddock 1.52
Hake 1.53
Halibut 1.61
Handling Fresh Fish 2.1; 2.2; 2.3; 2.4; 2.5; 2.6
Hawaiian Fisheries 1.0112
Herring 1.22
Home Utilization of Fish 2.8; 2.9; 3.26; 3.3; 3.4; 3.5; 3.8; 3.39; 4.81; 4.92; 6.3; 6.5

Ice 0.8; 2.15; 2.3; 2.6
Icelandic Fisheries 1.0143
Icing of Fish 2.15; 2.3
Income 9.2
Industrial Products from Fish 4.0; 6.0; 6.1; 6.2; 6.3; 6.4; 6.6; 6.7; 6.8
Inland Fisheries 1.0118
Inspection of Fish 2.2; 7.7; 7.8; 8.7; 8.8
Insecticides 3.18
Insulin 0.39; 6.72
Iodine 2.9; 3.29; 3.39; 6.3; 7.462; 8.42
Irish Moss 6.35
Isinglass 6.83
Italian Fisheries 1.0149

Japanese Fisheries 1.015

Kelp 6.3
King Crab 1.86

Laboratories 0.11; 7.0; 9.4
Lake Fisheries 1.0118
Lake Herring 1.92
Lake Trout 1.37; 1.92
Landings 9.2
Laws 9.3
Leather, Fish 6.86
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Ling Cod 1.54
Livers and Liver Oils 4.15; 4.7; 4.8; 4.9; 6.2
Lobster 1.87
Locker Plants 3.24; 3.249; 3.26

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Mammals, Marine 1.95
Marine Plant Products 6.3
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Micronesean Fisheries 1.018
Middle Atlantic Fisheries 1.0116
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New England Fisheries 1.0115
New Products 2.06; 3.2; 3.3; 3.4; 3.5; 3.6; 3.7; 3.8; 6.54
New Zealand Fisheries 1.017
North American Fisheries 1.011
Norwegian Fisheries 1.0141
Nutrition 2.9; 3.29; 3.39; 4.9; 6.19; 6.29; 6.3; 6.5; 9.14
Nutritive Value 2.9; 3.29; 4.9; 6.19; 6.29; 6.3; 6.5; 9.14; 3.39

Ocean Perch 1.4
Oceanography 9.11
Odors 2.113; 2.15; 2.19; 2.2; 2.3; 2.4; 2.6; 2.8; 3.10; 3.18; 7.80; 8.80
Oils 4.0
Organoleptic Tests 7.80; 8.80
Oysters 1.81

pH 0.114; 7.3; 7.84; 8.8; 8.3; 8.7
Pacific Coast Fisheries 1.0112; 1.0113; 1.0114
Pacific Ocean Perch 1.4
Packaging 2.43; 3.238; 3.338
Panels, Judging or Tasting 7.80
Parasites 2.9; 9.15
Pearl Essence 6.84
Pearls 6.81
Perch 1.4; 1.9; 1.92
Pet Food 6.53
Periodicals 9.6
Philippine Islands 1.015
Pickled Fish 3.8
Pike 1.92
Pilchard 1.24

Poisonous Fish 2.9
Pollock 1.5
Pollution 2.3; 9.15; 9.19
Portuguese Fisheries 1.0148
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Processing 2.3; 3.23; 3.33; 3.4; 3.5; 3.6; 3.7; 3.8
Proteins 0.321; 6.61; 7.51; 8.51
Purse Seines 2.1125

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Quality Control 7.8; 8.8

Rancidity 4.5; 7.87; 8.8
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Recipes 2.8
Red Snapper 1.0117; 1.4
Reduction (Processes) (Equipment) 6.13
Refrigeration 2.4; 3.2
Regulations 9.3
Research 0.9
River Fisheries 1.0118
Rockfish 1.4
Rosefish 1.4
Rough Fish 1.9

Sablefish 1.56
Salmon 1.30
Salt Fish 3.12; 3.4; 3.5
Sanitation 2.3; 3.18
Sardines 1.24
Scales, Fish 6.84; 9.125
Scaling Machines 0.12; 2.3
Scallops 1.84
Sea Lions 1.95
Seaweed 6.3
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Sharks 1.70
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Shellfish 1.80
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Shucking 1.80; 2.3
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Skates 1.79
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Sole 1.69
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South Atlantic States Fisheries 1.0116
Spanish Fisheries 1.0148
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Swedish Fisheries 1.0144
Swordfish 1.9

Taste 7.80; 8.8
Tasting Panels 7.80
Technology, Fishery 0.6; 2.0; 3.0; 6.0
Temperature 0.113; 7.7; 7.779; 7.8; 8.7; 8.8
Thawing 3.23
Thiaminase 0.38; 2.9; 3.29; 6.51; 6.52; 6.53; 7.591; 8.59
Toxicity 2.9; 3.29; 3.39; 4.92
Transportation 2.5; 3.26; 3.25
Traps 2.1124; 2.1128; 2.1474
Trash Fish 1.9
Trawling 2.1121; 2.1471
Trolling 2.1122; 2.1472
Trout 1.37
Tuna 1.1
Turtles 1.93

United States Fisheries 1.011
Utilization of New or Little Used Species 2.06; 2.6; 2.8; 2.9; 6.5; 6.6; 6.7; 6.8

Vessels 2.115; 2.117; 2.118
Vitamins 5.0

Waste, Fish 1.9; 6.0
Whales and Whaling 1.953
Whitefish 1.92
Whiting 1.5
World Fisheries 1.01

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