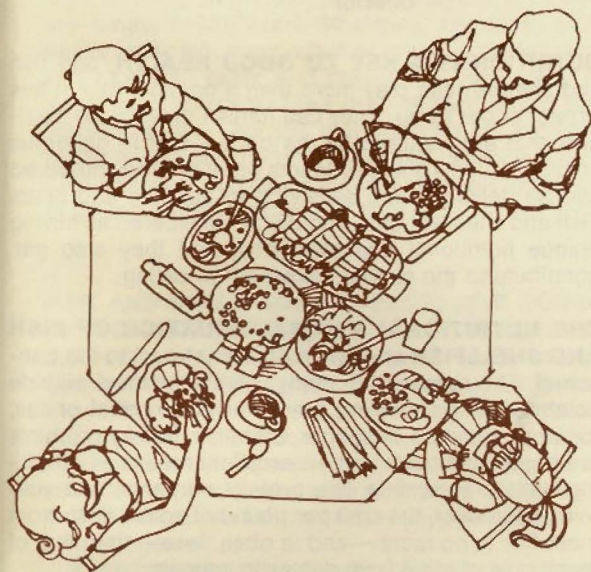


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SEAFOODS AND HEALTH



FISHERY MARKET DEVELOPMENT SERIES NO. 17

by
Dr. Bruce R. Stillings
and
Mary H. Thompson

Dr. Stillings is a Supervisory Research Chemist at the National Marine Fisheries Center for Fish Protein Concentrate at College Park, Maryland. Mrs. Thompson is Program Leader at the Tropical Atlantic Biological Laboratory, Miami, Florida.

FOREWARD

Throughout the eons of man's existence fish has played a vital role in his diet. Until recent years, however, little recognition has been given the nutritional and dietary values of food from the sea. We have come to realize that fish and seafood not only satisfy the appetite and taste, but provide valuable proteins and minerals so necessary for young and old alike.

This leaflet offers valuable information for the professional responsible for feeding vast numbers of people daily and the housewife planning a balanced diet for her family.

Philip M. Roedel

Philip M. Roedel
Director

NUTRITION IS A KEY TO GOOD HEALTH, and fish and shellfish can play more than a nominal role in this aspect of our living. They can furnish most of the nutrients that are required by the body—and in generous amounts. Also, fishery products when properly prepared can be delicious and satisfying to appetite and taste. Fish and shellfish, thus, should be considered as having unique nutritional characteristics, and they also can contribute to the simple enjoyment of eating.

THE NUTRITIONAL CHARACTERISTICS OF FISH AND SHELLFISH should be of vital interest to the consumer. The reasons are many. Dietitians must provide balanced and appealing meals, at economical prices, for large numbers of people. Certainly, fishery products are highly nutritious and an excellent means of obtaining dietary essentials, like protein, minerals, and vitamins. Moreover, the cost per pound of edible flesh from most fish is no more—and is often less—than that of many cuts of meat from domestic animals.

Individual consumers may be concerned about the caloric content of foods. The fat content of fish varies greatly between different species, and those with low amounts of fat are particularly suited for weight-control diets. Moreover, the fat in fish contains a high proportion of polyunsaturated fatty acids. Because a high proportion of polyunsaturates in the diet may help to decrease the incidence of atherosclerosis, heart specialists are particularly interested in the nutritional quality and composition of fishery products. Many doctors are now recommending generous portions of fish in the diet to increase the intake of polyunsaturated fatty acids, while insuring an adequate intake of protein.

Fishery products are also easily digested. They thus can play a major role in the diets of young children and elderly people, where ease of digestibility is of critical importance.

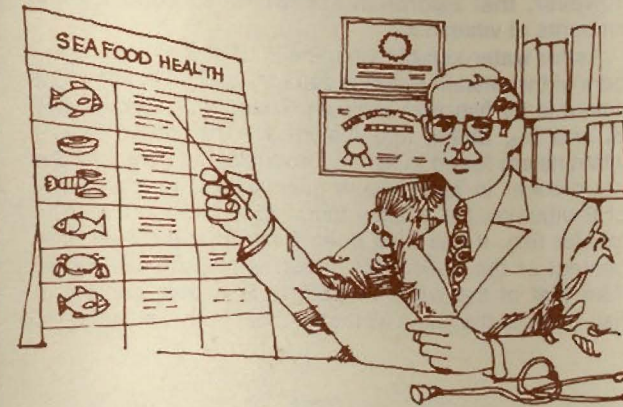
CUSTOM-TAILORED DIETS CAN BE PREPARED by the proper selection and inclusion in the diet of either fat or lean species of fish. Like people, fish come in many sizes and shapes, and may be classified as lean, medium, and fat. Of course, fat is only one of the major components of fish. The others are protein, minerals, and water. In general, an inverse relationship exists between the fat and water content of fish. These two components account for approximately 80 percent of the weight of fish, and when one of these is high the other tends to be low.

Most fish and shellfish contain low amounts of fat and high amounts of protein. In this category, for example, are tunas, halibut, cod, flounders, haddock, pollock, mullet, rockfish, carp, whiting, crabs, scallops, shrimp, and lobsters. Tunas and halibut are particularly good sources of protein. Fish that often contain higher amounts of fat—but still high amounts of protein—include anchovies, herring, mackerel, salmon, and sardines. Oysters and clams contain relatively low amounts of fat and protein, because of their high content of water.

FISH AND SHELLFISH ARE EXCELLENT SOURCES OF HIGH-QUALITY PROTEIN. Scientific studies have shown that fish and shellfish contain protein of excellent quality that clearly place them in a unique and enviable class. There is no mystery surrounding the attributes of protein from fish. Simply stated, protein in fish and shellfish contains generous amounts of compounds called amino acids, which are needed to construct body protein. Moreover, fish protein is easily and almost completely digested.

A serving as small as 4 ounces of lean fish will supply about half the total amount of protein required each day by the body. The other half can easily be supplied by a normal intake of protein of nonanimal origin. Although total protein content varies between lean and fatty fish, amino acid composition and quality of the protein is remarkably constant. Thus, the quality of the protein is high, regardless of whether it comes from lean or fatty fish.

Fish and a few other foods are often referred to by food faddists as brain food. There is no basis for this claim. In fact, no such thing as brain food exists, any more than there is a big-toe food or a little-finger food. As we have pointed out, fish is a particularly good source of high-quality protein. When it is included in a balanced diet, it provides nourishment to all body tissues and shows no special preference for any particular part of the body.



Certain shellfish contain protein that is especially high in quality. Oysters, for example, are extremely well suited for man and are frequently used in therapeutic diets. The protein content of oysters is low, compared to that of most other fish and shellfish. The quality of oyster protein, however, is superior to that of most fish and to that of beef. Although oysters are excellent food, we have no scientific basis for the commonly held view that sexual potency is increased when generous amounts are consumed.

For many centuries, fish and shellfish have been considered to be easily digestible. Recent research has shown that 90 to 100 percent of fish protein is digestible. The digestibility of protein in fish and shellfish is considered to be slightly higher than that of beef and chicken.

Because fishery products are easily digested and well utilized, they are included in many special diets for people with digestive disorders. Fish and shellfish are used liberally in diets often recommended for convalescent ulcer patients.

Since fishery products contain low amounts of connective tissue and fibrous components, they are especially suited for low-bulk, bland diets. Here, the goal is to minimize the amount of undigested food in the digestive tract and still provide a diet that is nutritionally adequate. Often, fishery products can be included in diets for people with digestive disorders to provide a wider variety of main dishes that are flavorful and appealing, but still suited to special dietary needs.

OIL IN FISH AND SHELLFISH CAN PLAY A SIGNIFICANT ROLE IN HUMAN HEALTH. A great deal of attention has recently been given to the relationship between the amount and type of fat in the diet and the incidence of heart disease. This relationship has not been conclusively established—though evidence does suggest that a high intake of meat fat may be one of the predisposing factors contributing to heart disease. Because fat in fish and shellfish has a unique chemical nature, fishery products are often recommended in diets designed to minimize the risk of heart disease.

Two dietary modifications are often recommended to reduce the incidence of heart disease among vulnerable groups. The first is to reduce the fat content and the total caloric content of the diet. The second is to partially substitute polyunsaturated fatty acids for saturated fatty acids.



FISHERY PRODUCTS CAN PLAY A MAJOR ROLE IN HELPING TO REGULATE THE FAT IN DIETS, thereby reducing the incidence of heart disease. Many studies have shown that ingestion of oil containing large amounts of polyunsaturated fatty acids will tend to suppress the blood cholesterol level and lower the incidence of atherosclerosis. Few people, however, will want to consume oil directly for its polyunsaturated properties. A much more palatable method is simply to include generous portions of fishery products in the diet. To illustrate, some salmon average nearly 15 percent oil. A 6-ounce serving would furnish nearly an ounce of oil rich in polyunsaturated fatty acids.

Not only do fish contain high proportions of polyunsaturated fatty acids, but they also contain relatively small amounts of cholesterol. Fishery products generally contain about as much cholesterol, or cholesterol-like compounds, as meat and milk products. Certain cuts of beef and some egg products, however, contain up to 10 times as much cholesterol as is found in fish and shellfish.

Reducing the total intake of calories, however, is often as important as including liberal quantities of polyunsaturated fatty acids in the diet. In this case, fish that are low in oil can form the main entree of a meal. Total caloric intake will be reduced, while still providing adequate protein to meet the body's requirements. Low-fat fish and shellfish normally contain less than 100 calories in a 4-ounce serving. On the other hand, a 4-ounce serving of good-quality beef may supply well over 300 calories. For those who are calorie conscious, substituting seafoods offers a distinct advantage over meats that are high in fat.



FISHERY PRODUCTS ARE GOOD SOURCES OF SEVERAL VITAMINS.

We can divide the 13 common vitamins into two major groups, fat-soluble vitamins and water-soluble vitamins. In fishery products, fat-soluble vitamins are found in oil. Vitamins in the water-soluble group are in the water that is dispersed throughout. In the history of vitamins, it was early recognized that fish liver oil was a rich natural source of fat-soluble vitamins, especially vitamins A and D. Although fish liver oil is an extremely rich source of fat-soluble vitamins, the flesh of fish contains relatively small amounts.

Fish oil generally has a higher content of fat-soluble vitamins than the fat of land animals. In turn, it should not come as a great surprise to learn that fatty fish con-

tain more of these vitamins than do lean fish. Some fatty fish are an excellent source of vitamin D; lean fish contain very small amounts. The vitamin A content of the flesh of most fish is relatively low. It has been reported, however, that swordfish and whitefish contain high amounts of vitamin A.

As for water-soluble vitamins, four of the eight members of the vitamin B family can be supplied in adequate amounts by fish and shellfish. These four vitamins are B₆ and B₁₂, biotin, and niacin. The remaining four B vitamins are found in fishery products, but generally are not present in appreciable quantities. Larger amounts of B vitamins are usually found in high-fat fish than in low-fat fish. It has also been found that the B vitamin content of the dark meat of fish is many times higher than that of the white meat. The B vitamin content of fish is about the same as that of meat from land animals.

FISHERY PRODUCTS ARE ALSO A VALUABLE SOURCE OF MANY ESSENTIAL MINERALS.

It is well established, for example, that fish contain relatively large amounts of phosphorus, potassium, and iron. Conversely, the sodium and chlorine content of fish is relatively low, despite the relative richness of sea water in sodium chloride.

Since the advent of the low-sodium diet, much attention has been focused on the sodium content of fish and shellfish. Occasionally, doubt is expressed about the advisability of using fish in low-sodium diets that are prescribed for people suffering from hypertension. This doubt is not well founded, even in the case of salt-water fish.

With the exception of most shellfish, fish are low in sodium and can freely be used in low-sodium diets. Fresh oysters and soft clams are also low in sodium and can be used in these diets. Other shellfish often contain higher amounts of sodium and are not recommended for low-sodium diets. Also, if salt has been added during processing, fish will contain sodium levels in excess of the maximum permissible level. Since fish vary considerably in flavor and texture, they offer the possibility of variety and diversification in low-sodium diets.

Fishery products are noted for a high content of micro-minerals, or "trace minerals," such as iodine and fluoride. Because trace minerals perform vital functions, fish and shellfish are viewed with special interest. Most essential trace minerals are present in fishery products in amounts at least equivalent to those in meat, and usually in much higher amounts than in vegetables and dairy products.

FISH AND SHELLFISH CAN ALSO CONTRIBUTE TO THE ENJOYMENT OF EATING, as well as providing good nutrition. Over 150 varieties—either fresh or processed—are available to the consumer. With this multiplicity of choice, it is possible to find fishery products to please even the most discriminating palate. Seafood, however, is a most delicate food and must be handled with care from the time it is caught until it is placed on the table. Natural goodness and taste is easily lost if improper preservation and processing techniques are used. Whereas meats tend to improve with "aging," fish and shellfish are at their best when freshly caught.

The methods used in preparing fish and shellfish for the table are especially important. Good fish can be easily spoiled if improperly cooked. The flesh of fish may be likened to egg white. Fish should be cooked only until the flesh "sets" and can be easily flaked from the bones. Fish may be baked, broiled, boiled, or fried. Certain types of fish are more suitable for particular methods of cooking. For example, fatty fish are considered better for broiling and baking, and lean fish are more appropriately broiled, boiled, or steamed. The important point to remember is that overcooking should be avoided to preserve the natural texture and flavor.

Fish and shellfish can be delicious in taste and prepared with ease. They should be thought of as more than a substitute for meat. They can be used as a first course or an appetizer or as the main attraction. Even the most discriminating connoisseur can find the right seafood to suit his particular purpose and taste. When cooked and flavored with appropriate herbs and spices—and consumed with a special vintage wine—seafoods can be a truly enjoyable experience in eating.

U. S. DEPARTMENT OF COMMERCE
Maurice H. Stans, Secretary

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Dr. Robert M. White, Administrator

NATIONAL MARINE FISHERIES SERVICE
Philip M. Roedel, Director

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