Fish: A Valuable Pacific Island Food

It is a common prejudice in many countries that fish is inadequate from a nutritive point of view. Very often it is completely omitted from the diet, and when by chance it is included in a meal it seldom constitutes the main course. This outlook originates from several known causes, the chief probably being lack of habit and ignorance of the nutritive value of fish.

Fish are, however, a tasty and highly nutritive food. Numerous works on the food composition of fish have confirmed its high protein, mineral and vitamin content. It has been proved perfectly digestible and its caloric value has been defined.

The composition of fish flesh, like that of any other animal flesh, is dependent on several factors, including species, age, physiological condition and external environment. Variations within the same species are mostly evidenced by a difference in fat content.

The caloric value of fish flesh is determined by the amount of fat it contains. Thus, a distinction is drawn between the oilier species such as sardines, salmon, mullet, tuna, and mackerel; and the lean species (red-fish, barracuda, trevally, etc.). One kilogram of fresh fish from the former class provides 1,000 to 1,500 calories, while the same quantity from the latter gives only 600 to 700 calories.

High Protein, Mineral And Vitamin Content

The carbohydrate content is low, but the proportion of nitrogen in fish is roughly the same as in meat or poultry. It varies from 14 to 22%, so that fish constitutes a useful source of nitrogen. Moreover, fish proteins contain amino-acids “essential” to man; the tryptophane, methionine and lysine rates are relatively high.

As well as this high nitrogenous content, fish offers a greater quantity of minerals and vitamins than meat.

Fish, and especially salt-water fish, are particularly rich in phosphorus (2.29), calcium (0.22), magnesium (0.26), potassium (3.34), iron (0.11) (contents calculated in grammes per kilogramme of fresh fish meat), sulphur, copper, zinc, manganese, fluorine (0.60%), and iodine (0.55% approximately).

It is well known that the liver-oil of certain fish, particularly cod and halibut, is one of the richest sources of vitamins of the A complex. Important quantities of vitamins A and D are also found in the muscular flesh, especially in the oilier species. The vitamin B complex is present in noticable quantity in the flesh of many fish. Vitamin C, however, is totally absent (it will be remembered that cases of scurvy occurred frequently and with particular severity amongst sailors).

The vitamin content varies considerably according to the species; figures are not necessary here since the reader may refer to food composition tables.

It may be concluded that fish is a bulk-providing nitrogenous item of diet, with a high mineral and vitamin content. It is an excellent source of energy, and its nutritive value equals and may even exceed, that of meat.

Always An Important Pacific Staple

In the South Pacific, fish has always occupied an important place in the diet of inhabitants of the smaller islands and the coastal regions of the larger.

“The Polynesian diet,” writes Moerenhout, “consisted mainly of vegetables and fish, meat being eaten on very rare occasions only. Fish was abundant everywhere in their islands and the variety is so considerable, that a special study might well be devoted to this subject alone.”

Early explorers unanimously agree as to the very healthy condition of the island peoples; this in itself is sufficient proof, if proof be necessary, of the nutritive value of fish.

Moerenhout continues: “The natives of all the Polynesian islands, or at least those of the Society Group, were masters in the art of fishing, and I do not hesitate to claim they are as dexterous and skilful as any other people in the world. They know how to intoxicate the fish with certain vegetable substances which, when thrown into the water, would cast the creature into a benumbed state: shortly afterwards it would rise and float on the surface as if dead. As for fishing methods proper, these were very numerous . . . the three main methods (were) with hook and line, net and dart or spear.”

The same fishing methods also existed in Micronesia and on the shores of the Melanesian islands, where fish is similarly an important food. Thus everywhere in the Pacific fish was a staple and daily food.

It was mostly eaten fresh, roasted on hot cinders, or wrapped in leaves and braised in the native oven. It was often eaten raw, cut up in small pieces that the natives would dip, piece by piece, in salt water before putting them into their mouths.

The natives often prepared, in a calabash, a “sausage” made from seawater and pieces of fish, which they allowed to “mature” for several days; the result was somewhat similar to the Indochinese “nuoc-man”.

The methods for preserving fish were rather primitive; very small quantities being smoked or salted. Sometimes the surplus of tuna or bonito in particular, was reheated daily, in the native oven.

The fact that supplies are plentiful and markets very limited explains the lack of interest of the South Pacific islander in methods of preservation. The practice of barter with inland peoples was restricted, although often fairly regular. In the Trobriands, for instance, the coastal dwellers still continue to exchange fish for the yams grown by dwellers inland.

Islanders Have Less Time For Fishing

At present, the inhabitants of the Pacific still remain faithful to fish, despite the introduction into certain islands of beef cattle, the development of stock-raising and imports of tinned meat. However, certain important changes have taken place.

Economic evolution has led many islanders to devote the greater part of their time to growing cash crops. Consequently, the time that can be devoted to fishing—or to subsistence crops for that matter— is very limited. As a result, the money earned from cash crops is largely spent on imported foodstuffs. In some islands small fishing industries have been established, though development has been limited. Their aim is mainly to supply markets in local towns. The produce of such enterprises, mainly tuna and bonito, is very highly appreciated by the villagers, who buy eagerly.

I have often witnessed a scene that proves the truth of this statement and gives food for further thought. The buses which leave Papeete late in the mornings for the various districts of Tahiti are weighed down with tuna and bonito bought at the market from the fishermen who bring them there for sale.

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Yet early that very morning the same buses had arrived in town from the districts, laden with the produce of family or collective fishing in the villages. Several reasons account for this movement of fish. A trip to town is a treat, especially with the prospect of financial profit from the sale of fish from the reef, which usually sells at a higher price than tuna or bonito. Furthermore, and this is probably the most valid reason, tuna and bonito fishing is seldom practised nowadays in the district areas.

**Demand For Fish Still High**

Village fishing has gradually become less productive but the Pacific islanders have not stopped consuming fish as a result. The high demand for tinned fish testifies to this fact. Salted or dried cod has proved very popular in some islands, although its consumption has never attained the proportions witnessed in the West Indies. At present the greatest demand is for tinned fish, in spite of its relatively high price: salmon ranks first, then sardines and finally tuna.

This tinned fish has excellent food value. For instance, 100 grammes of salmon provides 138 calories, 20 grammes of proteins, 11 grammes of fats, 40 mg. of calcium, 1.2 mg. of iron. Analysis of 100 grammes of any kind of fish preserved in oil indicates: calories 314, proteins 22 grammes, lipids 24 grammes, calcium 44 mg., iron 1.3 mg.

The popularity of fish preserves probably accounts for local attempts at preservation. A factory in Papeete was engaged for some years in tinning bonito in coconut oil. Various difficulties, such as irregularity of supplies, lack of local demand, and limited possibilities for exports, hastened its collapse.

The introduction of the frying-pan has brought considerable changes in cooking methods. It allows for rapid cooking and necessitates only a minimum of equipment. These advantages are slight, however, since from the nutritional viewpoint, frying in oil or fat destroys or reduces certain nutritive elements which are preserved entirely by baking in the native oven.

Thus fish is still a much-appreciated staple food in the South Pacific. Successive changes have been described; an attempt to forecast its future on the basis of present conditions will perhaps prove an interesting conclusion to this short article which is purposely intended to be of a simple nature.

Various attempts are being made to increase our knowledge of seafoods with a view to obtaining consistently larger catches. These will supply export trade, and local demand, in fresh or semi-preserved form. Experiments in pond cultivation are in progress. In New Guinea, some inland rivers have already been stocked with fingerlings. These trials seem to promise good results.

**Fish-meal is already prepared industrially as cattle-food in Europe and America; it is now being produced in French West Africa and South Africa on a home industry basis as a food for human consumption. A relatively simple method has been devised for preparing adequate meals that keep well and have proved readily acceptable, even to children.**

Having established production, there will still remain the problem of ensuring a system of distribution and developing a taste for fish amongst those who are either partially or entirely unfamiliar with it. Thus, an educational campaign will be necessary in some areas.

The young shoots and leaves of *Ipomoea aquatica* make a tasty and nutritious green vegetable.

**Easily-Grown Semi-Aquatic Vegetable Is Highly Edible**

There exists a plant in the same botanical family and genus as the sweet potato which can easily be grown and propagated by cuttings on flooded lands, in pools and along the banks of streams. This is *Ipomoea aquatica*, Forsk. (*I. repens*, Poir., *I. repens*, Roth.) It is a perennial with a thick stem which bears at the nodes both the roots and the smooth leaves. The leaves are generally shaped like an elongated triangle and are supported by long stalks which stand erect above the surface of the water when the plant is growing on flooded ground.

The young shoots and the leaves provide an excellent green, which can be consumed either raw or cooked. In addition, this plant provides very good fodder for pigs.

Its food value is good, as can be seen from the following chemical analysis which was taken from *Composition of Foods Used in Far Eastern Countries*, Agriculture Handbook No. 34, U.S. Department of Agriculture, Washington, 1952.

The high vitamin A value should be noted, as well as the appreciable amounts of mineral salts and vitamins of groups B and C. In the swamp forests of New Guinea, where Sago is the staple food, the use of *Ipomoea aquatica* shoots and leaves might prevent the vitamin A di-