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FISH AND ITS USES: SOME HEALTH EDUCATION ASPECTS

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It is generally agreed that one of the more serious problems in nutrition in the Pacific is the availability to those who need it of sufficient protein food. This problem has particular relevance for expectant and nursing mothers and for young growing children. One cannot generalize completely about the Pacific; and conditions will of course vary from place to place, but the problem does exist to a greater or lesser degree in most areas.

By and large within the Pacific, the main source of animal protein is fish, since there are no large indigenous land animals readily found. Pigs are frequently raised, but are generally used on ceremonial occasions, and do not form a "work-day" staple. Much the same situation applies to poultry; eggs are not often used directly as food, partly because most hens run wild and eggs are hard to find, or are taken by rats; partly because one small egg is considered better value after it has turned into a chicken. Valuable vegetable protein is found in certain staples, particularly certain varieties of sweet potato and taro; but to get enough for bodily needs, large quantities must be consumed. It is almost impossible for very young children to obtain enough protein from the vegetable staples because they literally cannot eat large enough quantities.

Overt kwashiorkor (severe protein deficiency) is comparatively infrequent in the Pacific; except in certain limited areas. General malnutrition, and particularly protein lack not amounting to kwashiorkor, is unfortunately fairly common, particularly in the age group six months to about 4 or 5 years. It is during this age, when the child is being weaned from the breast and is not yet old enough to fend for himself, that the greatest difficulties are likely to occur.

Once he can fend for himself, he will probably start to improve, because he can frequently find nuts, and he will often be able to snatch for himself from the communal food supply. But in general both the mother and the growing child need an improved diet to build strong bodies and to maintain good health.

Protein is, or should be, available in sufficient quantities to meet most needs. The problems then, are those of:

1. making it available to all at all times
2. ensuring that what is available is used, and especially that it is used by those who need it most.

Fish is generally available from one or more of three sources:

- a) lagoon (and here I include also shellfish, lobster, etc.)
- b) open sea
- c) freshwater sources:
  - (i) rivers and other natural sources
  - (ii) artificial ponds.

### 1. Availability

Lagoon fishing may be done by men or women or both, depending on cultural factors. In some places only shellfish may be gathered by women; in others they may take part in all types of fishing. Lagoon fishing may be possible in weather that prevents deep sea fishing but there are certain limitations. It is possible (depending on the area of the lagoon, number of people fishing it, etc.) that a lagoon may be seriously over-fished and so cease to be a source of food. Many types of lagoon fish, and especially shellfish, lobsters, etc., do not lend themselves to preservation and must be eaten at once. Careful use of a lagoon, on the other hand, can ensure a supplementary supply of food if other methods fail. Essentially, then it becomes a problem of education of the community in fish husbandry.

Deep sea fishing is the most likely source of a fish supply that is, from any given catch, able to provide a surplus over immediate needs. The problem then becomes one of preservation of the surplus against a later time of need. It is from this source, too, that the bulk of what may be available to inland villages on volcanic islands, will come. Fresh fish will only be available to the closer villages; with no refrigeration there is a limit to how long it will be before deterioration sets in, rendering it liable to cause illness. For all distant villages, and even for those closer to the coast where immediate transport may not be available, some form of preservation is necessary if sea fish are to be used.

Freshwater fish in rivers, lakes etc. may be available to inland as well as coastal peoples. What is available may range in size and type from large fish to freshwater shrimps, depending on the location and size of the water supply.

Shallow, small or flat-flowing sources are likely to yield only a supplement and not a regular supply of fish as a staple. Fish will still be needed from other sources. These natural sources, if suitable, can sometimes be stocked with fish such as Tilapia to provide a regular supply of fresh fish.

The other potential source of supply is by the creation of artificial fish-ponds stocked with Tilapia or other suitable fish. These are successful only if carefully made and maintained. It has been argued that they are undesirable since they encourage mosquito breeding close to houses, and thus aid in the transmission of malaria or filariasis. This accusation may be justly made concerning any neglected body of water, natural or artificial. In fact, in a properly maintained pond, the young Tilapia should consume the mosquito larvae. A neglected pond will constitute a health hazard, as well as failing to supply fish. The solution lies in patient and careful continuous education on the proper maintenance of ponds. This means regular visits and follow-up as well as the initial instruction.

The final points with respect to availability concern finance and storage. For those who cannot themselves provide their own fish, either money payment or exchange of goods is necessary. In some places this may affect the amount of fish to reach those who need it most. While fresh fish must, and will, be used at once, preserved fish may need to be stored by the purchaser for periods of up to a few weeks. This means protection from animals (cats, rats, dogs, etc), from insects pests (flies, cockroaches, etc), and occasionally from mould caused by damp weather conditions. The average village house may not have suitable containers available - these may cost more than the family can afford. Yet to buy food only to have it go bad is not good either; it may result in no further purchases being made, and the family being deprived of much needed protein. It would seem desirable for those preserving fish for later use to give serious thought to storage as an essential part of this development.

## 2. Use of fish

The provision of sufficient fish to meet all needs, and its distribution throughout the community at a cost all can meet, is the first essential, but it is by no means all. Once a family has fish, the second basic problem is how the fish is used, and whether it reaches those who most need it.

Cultural beliefs may play a large part in determining who may or may not eat fish. In certain areas (often this may vary from village to village within a district) the eating of fish may be totally or partly forbidden to those who need it most, namely expectant and nursing mothers, and young children. The reasons given are usually vague and some such reason as "it gives too much wind in the belly" or "it gives a swollen belly" is put forward. To date it has not been possible to determine whether the underlying reason is associated either with toxicity of fish or the possibilities of food poisoning; or whether it is merely a carry-over from the days when the best foods had to go first to the men, who

needed strength for fighting or for deep sea fishing etc. It may be partly due to both causes. The idea of the better food going first to warriors and hunters is common to most primitive societies and was necessary for racial survival. It is this which is reflected in at least one area, where a child may not eat fish until he is old enough to catch his own.

Cultural beliefs of this kind, whose origin is lost, are frequently most difficult to change, and direct attempts to do so will only increase resistance. What is needed is for health workers (including health educators), fisheries officers, home economists, and others, to join forces and endeavour to find an acceptable substitute or a means of presenting the fish which removes it from direct association with the cultural tabu. For example, in certain parts of Africa where fresh milk, for various cultural reasons, was not permitted to those who needed it, powdered milk (which did not look the same) was accepted as a permissible substitute. Fish "meal" might be suitable in some parts of the Pacific. In others it might be sufficient to use the otherwise waste parts of the fish (head, bones, fins etc) to make a soup, of which the liquid only is used.

What matters in these instances is not the precise substitute that is found; But the fact that cognisance is taken of the existing beliefs and acceptable ways found by which these difficulties can be avoided. It may be argued that a fisherman need concern himself only with selling his catch and it is not his business who eats it. This may be true up to a point. But no Pacific territory can yet afford to neglect these other implications, and co-operation between all sections of the administration likely to be concerned, will in the long run pay dividends. What is needed is a workable compromise between what can be produced commercially at reasonable cost; what is (or can be made) acceptable to the community; and what will, from within the territory's own resources, assist in overcoming health problems and thereby ultimately raising the economic potential. Indeed and very simply, the more people who eat fish, the more economic opportunity for the fisherman.

As well as the often intangible cultural barriers to the full use of fish, there are other very practical ones. How does one prepare and cook the fish? This must be considered not only in the context of what is a good recipe; but also what are the utensils and methods available to the woman, be she town dweller or primitive villager. Since relatively more facilities are available in the towns, I propose to concentrate on village conditions.

Fresh fish presents relatively few problems. In the village one can roast it in the ashes, or in a stone or earth oven wrapped in leaves, or grill it over the open fire. A wooden container is adequate for the preparation of "raw fish" marinated in lime juice. If a suitable metal or pottery container of some kind is available, one can boil it, with vegetables, for "soup". Cooked in any of these ways, it should be suitable for all but the very youngest children, provided they are permitted to eat it. If the family has a second container, heads, bones etc. can be boiled up again and the liquid used for children. In both this case and

the case of family "soup" the danger is chiefly that large amounts of water will be used, the liquid given children will not be concentrated enough to give enough nutrients, and perhaps too much of the valuable liquids may be thrown away or given to animals. Education in cookery methods and in food values is needed. All of these methods are either traditional, and so acceptable; or else require a minimum of effort in the preparation and cooking, and hence are acceptable to the "housewife"!

Fish which has been preserved needs different preparation and cooking. Salted dried fish, sundried fish, or even smoked fish, may, however they are prepared, be quite unsuitable for children of two or under. Fish flakes, if large, may also be unsuitable for young children because they are too hard. It would seem that there is a very great lack here, and that more work should be done on the proper preparation of fish flakes and the provision of simple recipes, using available cooking methods and utensils. Even more important is to teach these methods and recipes to the village women who will be using them, and who may find it difficult, if not impossible, to follow written directions.

Sundried fish is frequently eaten as it is by older children or adults, and no cooking is involved. Smoked or salted fish may be boiled if a suitable container is available, and vegetables may or may not be cooked with it, depending partly on how many cooking vessels the family has. For those who still use the open fire or the stone or earth oven, such fish may need to be eaten as it is since further cooking without liquids will only toughen the fish still more. If coconuts are available, the earth or stone oven can be used, and the fish cooked with coconut cream. If coconuts are not available, then liquid in some other form would be needed, and what is used would depend on what is available. This might necessitate local investigations and teamwork by home economists and health workers in finding, and teaching, locally acceptable methods. The conservatism of most islanders in adopting either new methods or new flavours must also be taken into account.

Fish flakes, which are probably one of the best means of preserving fish in the Pacific, have special difficulties in use. To ensure their keeping qualities they must be very dry, and this means relatively long soaking to soften them sufficiently for cooking and eating. Twelve hours, in warm water, is suggested as the time required. Under village conditions one needs to consider whether a family is likely to have a suitable container which can be spared from other uses for the time required to soak the flakes. Are there adequate means for protecting the flakes during soaking from the depredations of cats, dogs, chickens, and rats; and from contamination by flies, cockroaches and other insect pests? The answer to both these questions is probably only too often "no". Even where proper soaking is possible, there may be ignorance of the necessity for this, resulting in badly prepared and unpalatable food, with a tendency to not purchase flakes again.

One possible way round the difficulty is shorter soaking followed by pounding with a pestle and mortar, as is done in Malaya and other places. Where other foods are traditionally treated this way, it may be simple to extend the technique to fish flakes. This however is not always, and indeed not frequently, part of the cultural pattern in the Pacific, and the introduction of a new technique of this kind, or the provision of pestle and mortar, or even pounding between stones, might be more than enough to deter the village housewife. Tough, or relatively tough, fish flakes in a family pot of "soup" may be more or less accepted by adults, but their use in child feeding is much less likely.

Another possibility is the use of fish "meal" - i.e. fish prepared in the same way as flakes, but reduced by the manufacturer to the consistency of oatmeal. This could be added to the "soup" straight from the container, without the need for preparation. It would be suitable for baking only if coconut cream or some other suitable liquid ingredient were available, though at a pinch possibly even water would serve. Certainly it would be suitable for use with very young children. Being in the form of meal, it is possible that it might be acceptable where custom now forbids fresh fish.

In summary, greater use of fish in the diets of Pacific islanders, and its use in helping to combat present deficiencies, can be added by:

1. Co-operation of interested departments in the development of suitable means of preservation, with due regard to
  - production costs
  - storage and transport (containers, etc)
  - use by the community (existing cooking facilities, etc).
2. Greater attention to practical instruction in storage, preparation and cooking of all types of fish (fresh or preserved) through health workers, schools, women groups, etc.
3. Study of cultural patterns and tabus on the use of fish, and the development of long-term educational measures to help overcome these, together with finding acceptable fish products to be substituted in the meantime.