

FOODS AND FISH

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Occasionally, it is instructive to look a little critically at the things we do. Fish feeding, for example, is the single activity done most often in the aquarium hobby, but aquarists seldom think about the composition of the foods they feed their fish. Fortunately, most of the better brands of fish food are balanced with respect to essential nutriment required by most species.

Food consists of proteins, fats, carbohydrates, vitamins and minerals. Proteins are a source of growth and energy. Fats, including oils, are essential for growth and biochemical processes and are also used to store energy used in times of stress, such as during mating, egg-laying and winter. Carbohydrates are a source of energy and they play a big role in biochemical processes. Vitamins are the catalysts of biochemical processes and minerals, such as calcium, are necessary for bone development.

Proteins are amino acids in chains which are broken down by digestion processes. Fish need to have more than 20 amino acids. The loss of just one in the diet can have a detrimental effect on the synthesis of the others. All amino acids need to be present in the right proportions to be useful. If poor quality food is fed, the fish will have to eat more of it just to obtain the right proportion of amino acids.

For example, fish pellets as used in hatcheries fit this latter category. They are of poor quality and are used simply because they are cheaper than the foods we use in the hobby. Some of the components of the fish pellets occur in excess and are not used by the fish. They must eat more food to obtain the proper proportions of amino acids. As a result of the excess of unused foods, pollution would occur in a small closed system such as a fish tank. In a fish hatchery, water is being constantly changed, so this would not necessarily be a problem. With our flake foods, we actually feed less per fish than do the commercial people. This is because the fish utilise the better quality food more efficiently.

Mammals have fats in their bodies whereas fish have oils. Oils are unsaturated, meaning that they have very low melting points. The more 'saturated' the fat, the higher its melting point. The saturated fats mammals have under their skins provide warmth during winter. Fish assume the temperature of the water and don't use oils in temperature regulation. Instead, their oils are stored in internal organs. Fish can't cope with mammal fats in their diet and this is the reason they should be trimmed from meat before feeding. Mince or hamburger, which are full of fats, should never be fed to fish.

Carbohydrates provide an energy source, as do proteins. With carbohydrates, the breakdown products are less of a problem than with proteins which result in the formation of urea and ammonia. These convert to nitrites which are of concern of aquarists, especially those with marine tanks. Carbon dioxide and water are the breakdown products of carbohydrates.

Fish-food manufacturers have conducted many investigations into diets and foods. This is not just because of the big interest in keeping tropical fish, but also because of the important farming of fish for food in countries with protein

shortages. Below is a generalised scheme of fish food requirements:-

proteins (high quality)	35%
oils (lipids)	10%
vitamins and minerals	5%
carbohydrates	50%

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