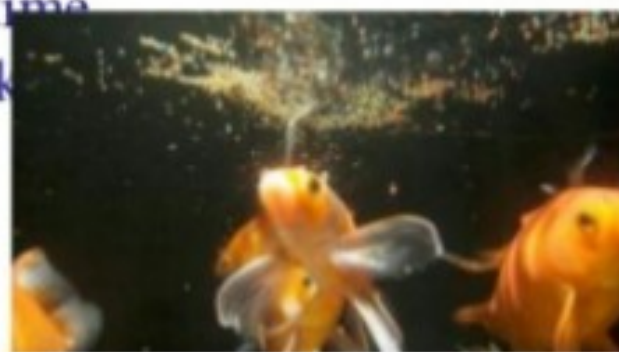


# Food and Feeding



# Introduction

- The right kind of food will increase the activity and longevity of fish and help them adapt quickly to the aquarium environment and bringing out their best colours.
- Fish foods normally contain macro nutrients, trace elements and vitamins necessary to keep captive fish in good health. Some fish foods also contain additives such as sex hormones or beta carotene to artificially enhance the color of ornamental fish.
- It is important to know the types of foods fish need and how much food they need. Most fish should be fed two or three times a day.
- Some fish have slow metabolisms and need be fed only once a day. eg. goldfish.
- Fish need only a small amount of food at a time.
- Feeding more than needed will dirty the tank.
- Stop feeding when they stop eating.





The metabolism of fish is controlled by their surrounding temperature. The lower the temperature, the lower the digestive time.

Generally spoken, the digestive time for fish kept in 74-78 degrees is about 16-24 hours. Therefore once-a-day feeding is ample.

## Sources of fish food

- Fish meal (protein source) have two basic types: (a) those produced from fishery wastes associated with the processing of fish for human consumption (such as salmon and tuna) and (b) those from specific fish (herring, menhaden and pollack) which are harvested solely for the purpose of producing fish meal.
- Shrimp meal is made from cull shrimp that are being processed before freezing or from whole shrimp that is not of suitable quality for human consumption. The material to be made into shrimp meal is dried (sun-dried or by using a dryer) and then ground. Shrimp meal is a source of pigments that enhances the desirable color in the tissues of fish. It is also a secondary supplemental protein source for fish.
- Squid meal is made from squid viscera portions from cannery plants including the eggs and testis. Squid Meal is a highly digestible protein source for fish which provides a full range of amino acids, vitamins, minerals and cholesterol (1.0–1.5%) of cholesterol suitable for fish fry and young fish.

• **Brine shrimp** (adult *Artemia*) is a common food source for fish that are available in adult-form, as eggs or freeze-dried. Brine shrimp is a source of protein, carotene (a color enhancer) and acts as a natural laxative in fish digestive systems. Brine shrimps can also supply the fish with vegetable matter due to their consumption of algae.

• **Soybean meal** is a high protein source for fish and has become a substitute for traditionally-used marine animal meals.

• **Spirulina** is a blue-green plant plankton rich in raw protein, vitamins A1, B1, B2, B6, B12, C and E, beta-carotene, color enhancing pigments, a whole range of minerals, essential fatty acids and eight amino acids required for complete nutrition.

• **Whole wheat** (carbohydrates) is not the best source of energy in fish but is an excellent source of roughage for fish such as Goldfish and Koi. It is also a natural source of vitamin E which promotes growth and enhances coloration.

# Aquarium Fish-food may include



1. live foods and
2. processed foods.

1. Live food consists of plants, animals and microorganisms that do not cause harm to the fish. Live foods are always better than dried processed foods as they contain better quality of protein than dried foods.
2. Processed foods include fresh, frozen, freeze-dried, and canned foods.
  - a) Fresh foods can be small bits of meats, vegetables and fruits like beef, chicken, pea, beans, peeled apple etc.
  - b) Canned foods provide a balanced diet and comes in a variety of forms such as flakes, pellets, granules etc. Among canned foods flaked food is the most common food used and is best for small fish. Pellets such as the floating ones and sinking ones are suited for big fishes. Pelleted forms, some of which sink rapidly, are often used for larger fish or bottom feeding species such as loaches or catfish.
  - c) Frozen diet such as shrimp or bloodworms provide a good source of digestible protein.
  - d) Insect larvae, worms, meats etc are available in freeze dried forms. They should be moistened before feeding.

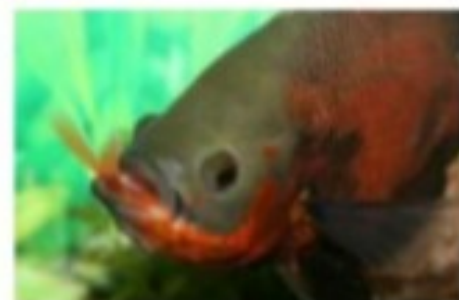
## Live foods

Live fish food include earthworms, sludge worms, water fleas, bloodworms, and feeder fish. Food for larvae and young fish include infusoria (Protozoa and other microorganisms), newly hatched brine shrimp and microworms.

These are the most preferred type of food for fishes, but are difficult to get. However, freeze dried forms of earthworms, tubifex etc. are available now.

**Feeder fish** is the generic name for certain types of inexpensive fish commonly fed as live prey to captive animals such as sharks and turtles.

The species of fish usually sold as feeder fish are invariably some of the easiest fish for fishkeepers to rear and breed, such as goldfish and guppies. Typically, these species are tolerant of overcrowding and have a high fecundity and rapid growth rate. In some cases, species of predatory animals, typically large fish such as catfish and cichlids but sometimes also animals such as freshwater turtles, are provided with feeder fish because they accept them more readily than alternatives.



## Species used as feeder fish

Several fast-growing and hardy species are commonly sold and used as feeder fish. Depending on the locality, feeder fish may include:

- Low-quality, common livebearers, usually guppies, mosquito fish and platies
- Small cyprinids, particularly rosy red minnows and goldfish
- Unwanted livebearer and cichlid fry
- Female Siamese fighting fish
- Young tilapia
- Defective and weak fry
- Young Bluegill
- Certain Tadpoles





# Additional Types



## Prepared foods

Prepared foods are those foods that are non-living and are made by the aquarist or bought already prepared for consumption for fish.

## Dry foods

Flake food is a type of proprietary or artificially manufactured fish food consumed by a wide variety of tropical and saltwater fish and invertebrates. It is ideally suited to top dwellers and mid-water fish though numerous bottom dwelling species consume flake food once it has settled on the bottom. Flake food is baked to remove moisture and create the flaking, thus allowing for a longer shelf life. Generally the more moisture a particular example of fish food contains, the more readily it will deteriorate in quality.

Dry foods is also available as pellets, sticks, tablets, granules, and wafers, manufactured to float or sink, depending on the species they are designed to feed.

## Vacation food

Vacation foods — also known as "food blocks" — are designed to be placed inside the aquarium to forgo feeding while the owner is absent. These blocks release small amounts of food as they dissolve. Food blocks can be a good choice for smaller tropical fish, but can pollute the water.



## Medicated fish food

Medicated fishfood is a safe and effective methods to deliver medication to fish. One advantage is that medicated food does not contaminate the aquatic environment and also, unlike bath treatments, does not negatively affect fish, filtration and algae growth in the aquarium. The parasites will get treated spot on by medicated food, because the fish is ingesting it.

## Freeze-dried and frozen fish diets

Freeze-dried and frozen fish foods were primarily developed for tropical and marine fish and are useful in providing variety to the diet or specialist feeding needs of some species. These include tubifex worms, mosquito larvae, bloodworms, water fleas (*Daphnia* and *Cyclops* spp.) along with brine shrimp (*Artemia salina*).

## Ingredients of quality fish food

Fish food should ideally provide the fish with fat (for energy) and amino acids (building blocks of proteins) and the fish food (whether flake or pellet) must be speedily digested in order to prevent build up of intestinal gas, renal failure and infections (such as swim bladder problems and dropsy) and to avoid aquarium pollution due to excessive ammonia. Aquatic diets for carnivores must contain vegetable matter such as spirulina.

\* Amino acids are the basic components of proteins. An example of an aquatic diet that is a good source of amino acid is a crumbled hard boiled egg offered to small fry. Large amounts of DL-Methionine enhance the headgrowth of the Lionhead goldfish.

- Fats that are broken down into fatty acids are the main source of energy in fish especially for the heart and skeletal muscles. Fats also assists in vitamin absorption. Vitamins A, D, E and K are fat-soluble or can only be digested, absorbed, and transported in conjunction with fats.

- Carbohydrates are molecular substances that include sugars, starches, gums and celluloses. Most of the carbohydrates that are incorporated into aquatic diets are of plant origin and are sources of the enzyme amylase. Carbohydrates, however, are not a superior energy source for fish over protein or fat but digestible carbohydrates do spare protein for tissue building. Unlike in mammals, glycogen is not a significant storage depot of energy in fish.