

## **AQUARIUM MAINTENANCE: FEEDING**

Proper nutrition is important for the long-term health of the fish and to bring out their full, vibrant colors. Try to provide a balanced and varied diet that contains all the protein, fatty acids, fat-soluble carotenoids, carbohydrates, vitamins, and minerals to accomplish this.

Different types of fishes require dissimilar feeding requirements. For our purposes they will be categorized into predatory/prey species and subdivided into piscivores, herbivores, omnivores, and limnivores.

- Predatory species (piscivores) include cichlids, pufferfish, and lionfish. These fish have evolved eating large and occasional feedings. Because of this they should be fed less often and with larger foods; a large meal once a day, skipping a meal every 2<sup>nd</sup> day.
- Prey species (herbivores, omnivores, and limnivores) are just the opposite requiring small and often feedings.
  - Omnivores (Goldfish, Tetras, Damsel fish) should be fed small amounts at least twice a day. Only feed as much as they can consume in thirty seconds or count the flakes. A fish's stomach is roughly the size of one of their eyes, so feed accordingly. **Do not overfeed**, as a fish will gorge itself until its intestines burst. If there is any remaining food left floating or that has sunk, they are being overfed; cut the amount of food in half. Overfeeding not only directly affects a fish's health; it does so indirectly by decaying and thus harming the water quality. Other signs of overfeeding are "mold" growing on the substrate, food being unattended to, and feces trailing a fish's cloaca.
    - o A goldfish's diet should consist of special food with a lower protein and a higher carbohydrate content as the staple. To supplement this, they should also be fed blanched vegetables, beans, anacharis/elodea, oats, worms, etc.
  - Herbivores (Tangs, Silver Dollars, Surgeonfish) graze constantly and should be fed blanched<sup>1</sup> slices of fresh vegetables like zucchini, spinach, cucumbers, and peas as well as edible aquaria plants, spirulina flakes, and dried seaweed sheets. Make sure the plants, vegetables, and seaweed sheets are anchored or clipped firmly so the fish can easily grip and tear them. Remove whatever remains after a couple of hours.

- Linnivores (literally mud-eater) include loaches, catfish, and blennies. They will feed on algae, snails, and microorganisms that live within the substrate. They should be fed algae wafers, shrimp pellets, bloodworms, etc.
  - o Plecostomus' are linnivores and they require the presence of driftwood in their aquarium as they feed off the biofilm, which is a major component of their natural diet.

In addition the size, shape, and position of a fish's mouth will determine where and how it will eat.

- An upward-facing mouth is called superior and is suited for eating foods on the surface, or above them. (Ex. Bettas, Gouramis, Butterflyfish)
- A middle-positioned mouth is called anterior and is suited for eating foods in the mid-region of the tank. (Ex. Tetras, Rasboras, Goldfish)
- A downward-facing mouth is called inferior and is suited as a bottom feeder. (Ex. Loaches, Corys, Plecos)

Not all foods are created equally and to compensate for this a diverse diet must be given. A diet of live, frozen, and dry foods is sure to provide sufficient amounts of the nutrients needed to ensure maximum growth, health, energy, and color.

- Live foods:
- + Variety of rich options for freshwater, brackish, and marine; daphnia, brine shrimp, bloodworm (red mosquito larvae), earthworms, fruit flies, etc.
  - + Natural and complete food: after all fish have evolved for millions of years eating the same foods.
  - + Contains the nutrients encountered by wild fish and may contain some yet to be discovered that would be absent in dry foods.
  - + Some difficult species will only accept live foods. They must be weaned off live foods gradually through effort and patience of the owner.
  - + May induce breeding in fish and is definitely the best choice for raising fry.
    - May contain harmful pathogens, parasites, and diseases. Make sure to purchase only from a reputable retailer and check for freshness.
    - Only lasts for a week without additional care.
    - Cost is more than dry or frozen.

- Frozen/  
Freeze dried:
- + Variety of rich options including tubifex worms, mysis shrimp, krill, plankton, etc.
  - + Natural and complete food: after all fish have evolved for millions of years eating the same foods.
  - + Contains the nutrients encountered by wild fish and may contain some yet to be discovered that would be absent in dry foods.
  - + After weaning off live foods, frozen/freeze dried should be the only option as it provides the same nutritional value with more convenience.
  - + Guaranteed to be free of pathogens, parasites, and diseases.

- + Can last for years if properly frozen.
- Costs more than dry, but less than live foods.

Dry:

- + Wide variety of high-quality foods made for all types of fish.
- + Designed to contain sufficient amounts of proteins, fats, carbohydrates, vitamins, and minerals.
- + Will last years with proper storage/refrigeration.
- + Cost is the least and the most convenient option.
- Over time fish could lose interest and full growth potential will not be reached.
- Nutritional value deteriorates quickly, only buy enough to for a couple of months and refrigerate to maintain quality.

\* Feeder Fish

Some difficult species of fish like lionfish or voracious predators like piranha are fed feeder fish because either they will only eat live fish or the owner enjoys watching their pet eat how they would in nature. However, this form of feeding is doing them a disservice as these common fish (goldfish, minnows, guppies, etc.) are often: housed in crowded tanks, undernourished, and carriers of diseases. These are poor quality fish and should never be introduced into a stable, healthy ecosystem. The predator **must** be weaned off feeders and onto frozen since there are superior substitutes (frozen krill, silversides, beefheart, etc.) and they are guaranteed to be disease-free. It is of the utmost importance to begin the weaning process while they are growing; it will be much more difficult to succeed once they reach adulthood.

### **Vacationing**

If the trip is to last less than four days, don't do anything. Fish have evolved in such a way that several days without food does little damage to their body. For trips lasting more than four days there are several options available.

- Automatic feeders: These are reliable, programmable machines that release controlled amounts of flakes, pellets, and tablets multiple times a day and can hold food up to a month.
- Vacation blocks: Popular choice, but may cause water quality issues since they are constantly dissolving. For this reason blocks are best suited for ten-day trips or less.
- Obtain someone well informed: Plenty of aquariums have been wiped out by an inexperienced, but well meaning friend that fed too much. Have them feed small amounts every other day to reduce the risk and be sure to show them how much to feed. While they are there, have them check all equipment and count the livestock.

<sup>1</sup>Blanching is a cooking process wherein the item is plunged into boiling water for a brief amount of time. Immediately after removing the item from the boiling water, it should be plunged into a bowl of iced water. There are many positives to blanching, but aquarists mainly do it to soften firm vegetables.