



# THE ULTIMATE FISH TANK KIT

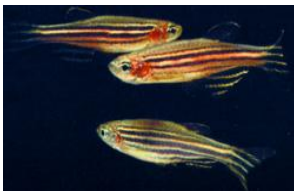
**How to create an aquarium that's healthy, balanced and beautiful.**



## The Best Fish Species For Beginners

You don't have to be a "beginner" to appreciate fish that tolerate a wide variety of water conditions, temperature fluctuations, break-in cycles, overfeeding and other common problems. While not indestructible, these species are among the hardiest of aquarium specimens.

**Zebra Danios** - *Brachydanio rerio* - These very active schooling fish are also among the sturdiest of aquarium residents. They stay small enough for 10 gallon aquariums and are quite peaceful if kept in groups of five or more.



**Other Danios** - *Brachydanio* and *Danio spp.* - The zebra is the most popular danio, but all its cousins (Leopard, Pearl, Blue, and Giant Danios) are every bit as durable. Many species are available in long-finned varieties as well.

**Black Tetras** - *Gymnocorymbus ternetzi* - Their coin-shaped bodies, vertical stripes and tall fins resemble those of angelfish, but Black Tetras are very much hardier. As with most other schooling fish, these mix best when kept in small groups. Also available in an all-white version and long-finned specimens are available in both colors.



**Red Eye Tetras** - *Moenkhausia sanctaefilomenae* - A pretty silver fish with a black band at the beginning of the tail and iridescent red eyes. Again a schooling species, Red Eyes tend to hang out near the surface of the aquarium.

**Black Ruby Barbs** - *Barbus nigrofasciatus* - These resemble the common Tiger Barb, but are much less nippy and take on a cherry red color when mature. May be mixed with other active fish, including the others on this list.

**Rosy Barbs** - *Barbus conchoni* - Perhaps the most peaceful of the mid-sized (3"-4") barbs towards unrelated fish. Males become bright red, while females remain olive or gold: both sexes have a prominent black spot near the base of the tail. Available in several selectively-bred color patterns and long-finned varieties.

**Green Catfish** - *Corydoras aeneus* - These classic scavengers are also very tolerant of varying water conditions and temperatures. Also available in albino form.

**Australian Rainbows** - *Melanotaenia melanopterus* - These get a bit larger (up to 8") than most of our previous listings, but are every bit as hardy. Look closely before you pass this one by; their iridescent colors are gorgeous at close range.

**Blue Gouramis** - *Trichogaster trichopterus* - Again a little more on the large side, Blue Gouramis really should be kept in tanks of about 30 gallons or larger, or they will harass each other and smaller unrelated fish. Also available in Gold, Platinum, Opaline, Three Spot and Lavender varieties.

## How to Set Up Your Aquarium

### Setting up

Get your tank fish-ready by following these steps:

1. Determine the size and location of your aquarium. Be sure it's near a power source, but out of direct sunlight and drafts.
2. Place your rinsed-out tank on an aquarium stand designed to support the weight of a filled aquarium [one gallon (4 L) of water weighs about eight lbs. (3.6 kg)] If using an under gravel filter, place it in the bottom of the tank now.
3. Pour rinsed gravel into tank. Use 1.5 lbs. (.7 kg) of gravel for every gallon (4 L) of tank to make a 2"-3" (5-8 cm) layer on the bottom.
4. Fill 1/3 of the tank with water treated with dechlorinator.
5. Place decorations, thermometer and plants in desired locations. If necessary, connect air pump and air-line tubing to appropriate attachments.
6. Fill remaining 2/3 of tank with dechlorinated water.
7. Place heater where water flow from the filter will mix the heated water throughout the aquarium.
8. Follow manufacturer's instructions to set up filtration (a filter should be able to process all of the water in the aquarium 5-10 times per hour).
9. Place hood/light on tank and plug in (light should be on for 8-12 hours a day).
10. Run filter for 24-48 hours and adjust the heater to the appropriate temperature for the species of fish you will be adding.
11. For the next 24-48 hours, watch for tank cloudiness. If it does appear cloudy, use a tank-clarifying product.

## **Adding fish**

After you have properly set up your fish tank, follow these steps:

1. Test the water's pH, ammonia, nitrite and nitrate levels. If levels are elevated, perform a partial water change.
2. Determine how many fish your tank can handle. Keep in mind the following:
  - One gallon of water for every one inch of full-grown tropical fish
  - Two gallons of water for every one inch of full-grown goldfish
  - Remember to always account for the adult length of fish to allow for growth
3. Only add 2-3 fish, but don't forget to:
  - Take fish home immediately after purchasing
  - Float the bag of fish for in the tank 15 minutes to allow water temperatures to equalize
  - Remove the bag and slowly pour the fish into a net over a bucket (this is to prevent adding the water in the bag to the aquarium)
  - Carefully add the fish to their new home
4. Feed the fish two hours after they have acclimated. It is very important not to overfeed your fish, as this one of the most common mistakes. Feed twice daily and only as much as can be consumed in five minutes.
5. Retest the pH, ammonia, nitrite and nitrate levels 48 hours after adding your fish. Test for each of these at least every other day for the first four weeks after setting up your aquarium.
6. Over the next few days, watch the tank for cloudiness. If it becomes cloudy, use a tank-clarifying product.
7. Six days after tank set up, do a 10% water change and test the water quality levels.

## **Maintenance**

Maintaining a healthy environment for your fish is an ongoing commitment. You can keep your aquarium in great shape with minimal effort by following this schedule:

Daily:

- Feed fish twice daily (only as much as can be consumed in five minutes)
- Check water temperature
- Check general health of fish

Weekly:

- Remove 10% of the water and replace with dechlorinated water
- Test for pH, ammonia, nitrite and nitrate
- Scrub for algae (if necessary)

Monthly:

- Perform a 25% water change/gravel vacuum and replace with dechlorinated water
- Perform filter maintenance (i.e., replace filter cartridge, replace carbon, rinse pre-filter, etc.)
- Scrub tank for algae
- Remove plastic plants/decorations and clean (if necessary)
- Replace air stone if used (allows for more efficient operation and makes the air pump last longer)
- Prune live plants (if necessary)

Always wash your hands before and after handling fish or cleaning the aquarium.

## **Aquarium cycling**

Your aquarium is a delicately balanced ecosystem dependent on the nitrogen cycle. By breaking down the unhealthy elements within the water, this cycle helps generate the "good" bacteria your aquarium needs. Critical to the health and survival of your fish, this cycle is a vital part of every aquarium. The first cycle can take 4-6 weeks to complete. Here's how you can get the cycle started:

1. Start slowly and let the tank run at least a day before adding any fish.
2. Add a few hardy fish such as danios, gouramis or livebearers, which can withstand the presence of ammonia and nitrites. Never add more than three fish to your aquarium per week.
3. Seed the aquarium with bacteria by purchasing a cycling aid product.
4. Do not overcrowd your tank. This is sure to lead to toxic ammonia levels.
5. Do not overfeed. This is the most common cause of fish loss.
6. Frequently test levels of pH, ammonia, nitrite and nitrate. Do a partial water change if the levels are elevated.
7. Be sure water is at the right temperature for your fish.

## Water test log

When preparing your aquarium, it's important to closely monitor water quality. The chart below will help you gauge where your levels should be as well as understand the results.

### **pH Level** -- NORMAL RANGE: 6.5-8.2

This is the measure of the activity (power) of the hydrogen ions in the water. The stability of the pH is related to water alkalinity and hardness. Rapid changes in pH are detrimental to fish.

### **Chlorine and Chloramine** -- NORMAL RESULTS: 0.0 mg/L

These are added to city water supplies to make the water supply safe for human consumption. Be certain to always use a dechlorinator when adding water to an aquarium because any amount of chlorine is toxic to fish.

### **Ammonia** -- NORMAL RESULTS: 0.0-0.25 mg/L

Aquariums with properly operating filtration systems should have no ammonia present (after they have been cycled). In new aquariums, Ammonia Removers can be used to lower ammonia levels, along with partial water changes.

### **Nitrite** -- NORMAL RESULTS: 0.0-0.5 mg/L

Nitrite reduces the ability of the fish's blood to carry oxygen. You can remove excess nitrite from an aquarium by performing a partial water change. Adding salt to the water at 0.1-0.3% (1-3 teaspoons of aquarium salt per gallon of water) also reduces nitrite toxicity.

### **Nitrate** -- NORMAL RANGE: 0-40 mg/L

If nitrate levels exceed 40 mg/L, water changes can be used to lower the concentration. High levels of nitrate can also cause increased algae growth.

### **Hardness** -- NORMAL RANGE: 100-250 mg/L

Water with high hardness usually has a high pH. Softening the water will lower the pH. Most fish will adapt to moderate hardness levels.

### **Alkalinity** -- NORMAL RANGE: 120-300 mg/L

With low alkalinity water, your aquarium may experience sudden and deadly pH shifts. Increase the alkalinity of the water to stabilize the pH.

### **Temperature** -- NORMAL RANGE: 74-82° F (23-28° C)

Use an aquarium heater to maintain stable water temperatures. Rapid temperature changes are harmful to tropical fish

## Aquarium Tips for Hot Summer Weather

Hot Summer weather can get the best of any of us, including our aquarium fish. Here are a few tips to help your finned friends through the season:

- Don't panic! Fish are far more likely to survive high temperatures than a drastic change in environment. Unless fish show signs of great distress, any adjustments should be made gradually.
- Maintain vigorous aeration and filtration. Warmer water holds less oxygen, so the primary danger in overheated aquariums is suffocation.
- Feed sparingly. Even though warmer water will increase your fishes' appetites, waste and uneaten food further reduce the water's ability to hold oxygen.
- Don't crowd the aquarium. The fewer fish, the more oxygen available per fish.
- Leave lights off during the hottest parts of the day. Lights are an additional heat source.
- Open aquarium cover to >Open aquarium cover to release heat. Evaporation cools; aiming a fan at the open aquarium will help as well. (Keep an eye out for fish jumping while tank is uncovered.)
- Check your heater. If the pilot light is on when the tank is already too warm, unplug the heater and repair or replace it. In Spring and Autumn, it may actually be best to set the heater a bit higher, to avoid huge differences between daytime and nighttime temperatures.
- Add cool water or ice only in emergencies (for example, fish are turning pale or gasping for air), and only in small, but frequent portions. Remember: change temperature gradually

## How To Set Up A Fish Bowl

Aquarium hobbyists have known for decades of the inadequacies of "fish bowls" for long term (or even short term) health of most fish. Though some hobbyists do enjoy a limited amount of success with fish bowls, most experience nothing but failure after failure. Our recommendation is always to provide your fish with adequate room, light, heat and circulation, and the tips below are offered to help make the best of a poor situation.

**Starting Up:** Fill bowl about 2/3 full with room temperature (65o-75o) tap water. If you are not certain of temperature, let water stand at least one hour before adding fish. Bottled Drinking Water (NOT distilled, R/O, Mineral or any of the fancy stuff, just the plain old water you get in gallon jugs at the supermarket) is also suitable and convenient. Add chlorine neutralizer if using new city water. Gravel and decorations are optional.

**Plan Ahead:** Set aside water now for next cleaning. Fill a clean glass or plastic container and store uncovered - ready to be used as needed. This water will not only be chlorine free but will be of similar temperature. If you are using Bottled Drinking Water, that may be stored covered in its original container.

**Fish Selection:** The best bowl fish by far is the "Siamese Fighting Fish" or Betta. They stay small, are slow moving, and don't have a lot of wander-lust, so small quarters suit them just fine. Their only real limitation is temperature, which should ideally be in the mid-70's. Guppies and White Clouds are probably the next best choices.

**Goldfish?** Goldfish are often selected for "goldfish bowls" not because they are well suited, but because they are often very tolerant of abuse. Healthy goldfish will

outgrow even a large bowl very quickly, and stunting them by keeping them in cramped, dirty quarters is certainly not to be recommended.

**Stocking:** Generally, one two-inch fish should have at least a gallon of water, although a solitary Betta seems content in even a smaller bowl. The smaller guppies and White Clouds should be kept no more than two fish per gallon.

**Feeding:** Don't feed fish their first night in their new home. Fish may be fed once or twice daily, but in very small amounts. Most small fish eat all they can in a minute or two, and any food left uneaten will only foul the water.

**Cleaning:** If not overfed or overcrowded, a properly stocked fish bowl will need to be cleaned once to twice a week. Gently pour the fish and old water into another clean container. Scrub and rinse bowl, gravel and decorations - use no soaps or detergents! Fill with "ready" water from above ready" water from above or proceed again from "starting up". Use a small aquarium net to transfer fish back from the temporary container.

## How To Fix Small Aquarium Leaks

To fix a slow leak in a small aquarium (gushing leaks and tanks larger than 40 gallons may require more extensive repair):

1. **Make sure it is the tank that is leaking.** Sometimes a hang-on power filter is overflowing or leaking, or an airstone is spraying water out the back corner, or a piece of paper, cloth or tubing is dangling into the water and "wicking" water out.
2. **Empty the water** - and everything else - from the tank. The sealant will need to be applied to the inside of the aquarium, where it will be pushed into the seam by water pressure.
3. **Remove old sealant** with a razor blade scraper. If the leak is apparent on a side seam, remove all the sealant from the entire length of seam. If water appears mysteriously at the tank's bottom, scrape out all four bottom seams.
4. **Prepare the seam.** Some aquarists use rubbing alcohol to remove oily fingerprints, others simply wipe with a damp rag. It is essential that the area be extremely clean and completely dry.
5. **Buy silicone sealer.** It doesn't matter if you get it at the local fish store or hardware store, but make sure the packaging plainly indicates that the product is safe for aquarium use. Some products contain toxic mildew-retarding chemicals that will kill fish.
6. **Apply sealer.** Hold the tube at an angle and push it forward while squeezing out the sealer, forcing sealer into gaps. Some hobbyists then run their fingers down the bead, further pushing the sealer, but sealer is extremely difficult to remove from skin, so this is not recommended. If you feel a need to manipulate a wet seal, lay clean, dry plastic bags over the seals first. Leave bags in place until sealer is dry; they will then peel off easily.
7. **Allow to cure.** Follow sealant manufacturer's directions as to how long to wait before re-filling tank. Adding water too soon will weaken the seal and possibly contaminate the water

# The Dos and Don'ts Of Filter Carbon

**What does filter carbon do?** Carbon has the ability to "catch" certain chemicals that occur in water (or air, for that matter) by "adsorption". In aquariums, carbon's chief role is to tie up the chemicals that cause discoloration and odors, which are then removed from the system periodically as the carbon is discarded.

**Are some carbons better than others?** Yes, some filter carbons (the coarse, shiny black stuff) are no more than anthracite coal, and have very limited adsorptive properties. Other carbons are "activated", meaning they were exposed to extreme heat and/or steam to increase their effectiveness. These dull, lighter, carbons may have hundreds of times the capacity of standard coal.

**Should everyone use the highest quality carbon?** Probably not. Many hobbyists use low to medium grades of carbon, but either use it in large quantities or change it often. Others have high-flow filters that can grind the softer, high quality carbons to dust, which is then blown into the aquarium. On the other hand, some filters hold only small amounts of carbon, so better grades should be used.

**Do carbons get full?** Yes, eventually the filter carbon has bonded all the chemicals that it can handle. How long that takes depends on the quality and quantity of carbon, the load of fish waste, and several lesser factors. If the aquarium water is taking on an odor or is yellowing, the carbon is full.

**Can carbon be re-activated?** In a word, no. Heating carbon in a household oven might reclaim a tiny fraction of carbon's power, but probably not enough to pay for the fuel to heat it. It is best to discard used carbon.

**How often should carbon be changed?** Once carbon is full, it served very little purpose in the aquarium. (It does become a site for good bacteria to colonize and break down ammonia and nitrite, but there's generally no shortage of such sites elsewhere.) Furthermore, some of the compounds adsorbed by the carbon will eventually break down and be released into the aquarium. Carbon should certainly be changed when colors or odors in the water indicate that it has become exhausted.

## Daily Aquarium Care

**Compared to other pets, aquariums need very little in the way of daily attention. In fact, it will probably take the hobbyist longer to read this brief article than it will to perform the maintenance involved.**

**Lighting:** unless the aquarium contains live plants, the aquarium light does not need to be on except while feeding or observing the fish. Room light is generally sufficient to keep the fish active during the day and leaving the aquarium light on for too long can cause unsightly algae growth. Most hobbyists, however, don't want to be bothered with turning the lights on and off several times each day and choose instead to simply leave it on continuously for 6 to 10 hours each day. An inexpensive electrical timer can be installed to provide the fish with a consistent light/dark cycle and compensate for the forgetful aquarist.

**Feeding:** after the tank's "break-in cycle" is completed, most common aquarium fish should be fed two or three times per day, but each feeding should consist of only as much as is consumed in two or three minutes. This takes a little practice, and the careful aquarist will actually time his feedings occasionally, to be certain that the proper amount of food is given. "Overfeeding" is feeding too much at a time, rather than too often. Fish could probably be fed 10 times a day without problem, but one overly generous portion every two days could cause problems. Uneaten food contributes to poor water quality, which causes water cloudiness, rapid algae growth, and often leads to fish disease. Alternating feedings among flake, frozen, freeze-dried, and pelleted foods will provide a well balanced diet for fishes of various feeding habits.

**Observing:** it is important to take a few moments each day to simply look at the aquarium fish. Did every fish get something to eat today? Perhaps some are picky about the type of food they will accept; or maybe others are being intimidated by the tank bully at mealtimes. Do all the fish appear to swim, breathe, and otherwise act normally? It takes some experience of course to determine what is "normal" for each type of fish, but daily observation will provide that experience. Do the fish all appear to get along? Even a tank full of so-called "community fish" can have compatibility problems, and fish that have gotten along just fine for months or years might suddenly begin to harass one another. And finally, are there any signs of torn fins, discoloration, white spots, red blotches or other signals of disease? Just as in human disease, treatments are most successful if the infection is caught early.

**Checking equipment:** the various pumps, filters and heaters typically installed on aquariums might well be referred to as the Life Support System. A quick glance at the thermometer should be made a daily habit - perhaps at feeding time. Fluctuations in temperature cause stress that often leads to disease outbreaks. Checking to make sure all other equipment is also plugged in, turned on, and operating properly takes only a few additional seconds and may well pre-empt a developing disaster.

## How To Feed Fish Correctly and Avoid Overfeeding Fish

In this age of controversy and discord, it's difficult to find any issue, whether in politics, child-rearing, or even fishkeeping, in which "conventional wisdom" goes unchallenged. It's refreshing to find that there's at least one area of our hobby that all of us, from expert to hobbyist to novice, can agree upon: ***it's important not to overfeed your fish.***

But even that sage advice falls short, as sage advice sometimes does, when it comes to addressing the questions of real life experiences. What is overfeeding? What problems does it cause? And how do I know if I'm doing it?

Overfeeding is simply putting more food in the aquarium than the fish can use. Uneaten food is the biggest danger, but even surplus food that has been eaten can wind up back in the tank as excess fish waste. It's a common misconception that overfeeding fish causes some sort of gastro-intestinal damage that leads to their untimely demise. While it's certainly plausible that a fish, for example a particularly

gluttonous goldfish, might overeat enough to develop a long-term health risk, the greatest risks of overfeeding are the result of the uneaten food left to rot in the aquarium. Uneaten food decomposes quickly, releasing an abundance of organic and inorganic compounds that wreak havoc on the aquarium's chemistry. There are several common symptoms of overfed fish tanks:

**Cloudy water** is almost always associated with something organic rotting in the tank, and most aquarists confronted by this problem need look no further for the source than that can of flake food on the shelf. In fact, a good test for the cause of cloudy water is simply to quit feeding the fish altogether for a couple of days (it's ok, very few fish are incapable of surviving a fast for a few days). If the water clears up, feeding habits (including size, timing and type of meal) need to be adjusted.

**Algae growth** takes a little longer to develop, but is probably even more common than cloudiness in overfed aquariums. Many algae, especially the slimy sheets of blue-green or red algae- impersonators (technically bacteria rather than true algae), thrive when there is an abundance of dissolved organics, nitrates and phosphates in the water. All of these are produced in quantity as uneaten food decays. A little algae growth is normal and fairly unavoidable, but if the tank needs scrubbing every few days, it's likely there is an excess of food or fish waste accumulating.

**Little patches** of fungus or mold will occasionally be seen growing on the gravel and plants. This is directly attributable to uneaten food. Where a flake or grain of fish food falls to the bottom or sticks to a plant, a little patch of white cottony stuff will sprout up, grow for a few days, and then disappear when its food source is used up. It may of course be replaced by others if overfeeding continues.

**Tiny, hair thin worms** will sometimes appear on the walls of an aquarium. These are almost always found in tanks of either young fry or large, pellet-munching fish like oscars, as they are generally eaten in tanks of more typically-sized community fish. They feed directly upon excess fry food or the "dust" that blows out of the gills of a large predator fish each time he gulps down a dry pellet or other soft food.

**Low dissolved oxygen**, high nitrates, declining pH, and other chemical problems are also common in the overfed aquarium. Many of the decay processes that "eat" uneaten food are aerobic - which means they utilize oxygen to break down the organic molecules. This is a good thing, because anaerobic decay produces some really disgusting compounds, like methane and hydrogen sulfide, that the aquarist would just as soon do without. There is still a price to pay, however, as the increased demand for oxygen by the decay processes mean less oxygen available to the fish. In addition, proteins in uneaten fish food are eventually broken down into nitrates and leftover hydrogen ions - just as fish waste is. The poor fish in the overfed tank have to deal with the pollution caused by the food without receiving the benefits of having eaten it!

## How to avoid overfeeding

**Time your feedings.** Fish in nature rarely get the opportunity to sit down to a leisurely meal. Perhaps that's why most fish, when presented with a shower of flake food, gobble it up like there's

no tomorrow, then suddenly stop eating when they can't possibly squeeze in another bite. The time involved to finish dinner will vary from fish to fish; some of the smaller, eager-eaters like danios may get their fill in ten or twenty seconds, while the bottom-feeding catfish may need several minutes to search out a satisfactory meal. Watch your fish eat, and try to get a feel for how long and how much they actually eat when you feed them - and then adjust the size of the feedings accordingly. Keep in mind that any food left after five minutes will likely never be eaten, and only serves to foul the water. Repeat this time test occasionally, as differences in temperature and the number and sizes of fish, will affect the overall tank "appetite".

**Feed often, but sparingly.** Some aquarists seem amazed that they have overfeeding-type symptoms, but only feed their fish "every other day". For most of us, overfeeding has little to do with feeding too often, but much to do with feeding too much at a time. In nature, most fish generally don't eat in "meals", but graze or nibble all day as opportunities present themselves. Their bodies are designed to deal with food in just that manner: a little at a time, but very frequently. If these fish are fed only occasionally, but in massive quantities, they could well suffer both malnutrition and the resulting poor water quality from overfeeding. You can keep a healthy tank while feeding two, three or four times a day, but the key is to keep the size of those feedings under control. (The exceptions to this rule are some of the larger, predatory fish that may indeed go for long stretches without finding food and then gulp down a meal half their size.)

**Feed the fish, not the tank.** It stands to reason that a six small fish should get the same size feeding whether they're in a 10 gallon tank or a 100, but we have a natural tendency to gauge our fish's meal size by the capacity of their living quarters, rather than that of their stomachs. The owner of six baby discus fish in a 55 gallon tank may not think twice about the possibility of overfeeding, but it's remarkably easy to do, especially since those few fish will have a difficult time finding every bit of food that has scattered over such a large area.

**Feed an appropriate food.** Sometimes food goes uneaten not because the fish aren't hungry, but because they can't handle the food as presented. In the case of the tiny worms mentioned above, the pellet food might be too easily smashed to dust in the jaws of a large predator; a harder or a softer pellet may solve the problem. Flake foods may be too small for large-mouthed fish, or pellets may be too large for those with smaller mouths. Some foods may float while your fish are searching the bottom; others may sink right past a surface feeder. Some foods might be just too darn unnatural for a picky eater who last week was feasting upon the "real food" of his natural habitat. Once again, watching your fish eat will give you valuable information as to the acceptability of your offerings.

**Scavengers help** - at least a little. Many catfish and loaches wait until food settles to the tank bottom before beginning to feed, which makes them useful in cleaning up some of the scraps the other fish missed. This doesn't really solve the problem of too much food, since the "perfect" amount of food is based on the total number of fish, including the scavengers. However, a few scavengers can help substantially when the problem is food that has become inaccessible to the other fish by falling beneath their feeding zone or getting trapped in the nooks and crannies of the tank's decor.

**No "junk" food, please.** Who among us would save a couple of bucks on a can of fish food if we knew it would mean more water changes, or worse yet, lost fish?

There are good quality fish foods available, and poor quality foods as well - and price alone may not be much of an indicator of which is which. But don't keep feeding a food which isn't working out well, and certainly don't feed from that half bag you found in the attic from the tank you had two years ago. Good foods will be eaten readily - and completely - and will provide the nourishment that leads to healthy, growing and more colorful fish.

**Try new foods carefully.** Fish are creatures of habit, and will sometimes fail to recognize that the snowstorm of new, improved flakes falling all around them is food. That doesn't mean the new food is no good, only that your fish are expecting something that looks, feels, smells and tastes just like the stuff they ate yesterday and the day before. They will usually adjust, especially if you feed a variety of foods anyway, but it pays to be extra cautious the first few times you try a new food. Feed very sparingly, and remove any food left uneaten after a few minutes. It may be necessary to discontinue feeding all the old favorite foods for a few days to further induce your fish to accept a change in diet.

**Remove uneaten food immediately.** This serves two functions: first, to reduce the amount of food left to decay in the tank; and second, to further train the aquarist as to how much and what his charges are consuming. Don't count on your filtration system to do this job, unless you're planning to clean it immediately. Uneaten food rots just as well in the filter as in the tank itself, with exactly the same consequences. Use a fine net or siphon and try to remove as much as is practical.

**Finally, stick with it.** The rewards of a cleaner tank and healthier fish are well worth the effort

## Caring For Fish When You Go On Vacations

The most pressing concern is feeding, and there are several time-tested products available to meet that demand.

**Time-Release Blocks.** The most common method of vacation fish feeding is using the inexpensive feeder blocks that slowly dissolve or are grazed upon, releasing food over the course of a few days to two weeks. These seem to be quite adequate for a typical community tank of tetras, barbs and the like, who can generally be counted upon to eat practically anything organic with gusto. The blocks are less effective for larger or aggressive fish, as a few dominant individuals will often declare the block to be their own, or a glutton will whittle them away in a few hours. The binders used in feeder blocks do slowly dissolve in the aquarium water, but are generally safe for a typical freshwater community tank if not used too frequently between water changes. It is probably best not to use them in tanks where water chemistry is critical, such as marine aquariums or the soft/acid setups sometimes used for discus and other South American species.

**Mechanical feeders.** A better, though somewhat more expensive (at least in the short term) solution is mechanical feeders. There are several designs available, and if their fish eat dry foods, the hobbyist can probably find a suitable feeder to deliver it. Most are designed to feed flake or small granular foods, but at least one larger

model can be used for pebble-sized pelleted foods. The size of the portion can usually be set, although some models require more guesswork than others. The timing mechanism also varies from model to model: some simply feed approximately every 12 hours, others can be mechanically set a bit more specifically, and some require a Ph.D. in electronics (or the equivalent 10 year old child) to program.

The obvious advantage to mechanical feeders is that fish won't need to adapt to a new, or worse yet, a lesser food than their owners have been feeding them all along. They are suitable for most types of fish - even saltwater - although larger tanks may require multiple feeders. On the downside, by their very nature they clog quite easily when placed too close to water, so the hobbyist needs to install them properly above the tank, well away from the splashing of airstones and pumps. Their biggest disadvantage is initial cost, but at a buck or more a pop for feeder blocks, mechanical feeders are cost effective in the long run.

**Alternatives for Special Situations.** For fish with vegetarian leanings, adding a healthy bunch or two of "anacharis" (Elodea species) or "hornwort" (Ceratophyllum demersum ) is an all-natural solution that allows 24 hour grazing. For young fry or other smaller fishes, there is a brine shrimp hatchery that can be installed inside the aquarium, and the tiny shrimplets ("nauplii" if you really want to get technical) wander out into the tank continuously as they hatch.

**Do fish really need to be fed so regularly?** Most fish could survive for a few days with no food at all; in fact some hobbyists have recommended an occasional fasting period for aquarium fish, although the benefits are not easily measured in the home aquarium. On the other hand, smaller fish often begin to decline in health rather quickly, and could easily be at risk within a week or so. Similarly, younger fish may survive but fail to develop properly without frequent, regular feedings. Aggressive fish often become even more so when hungry, so there could be casualties from brutality even if there are none from malnutrition.

**One Last Meal.** It's a natural temptation for a fishkeeper to give an extra or extra-large feeding shortly before leaving town. Uneaten food of course begins to foul the water within a few hours, and even the excess food that is devoured is only partially digested before becoming fish waste a few hours down the road. If the resulting pollution is substantial and left unattended for days, the hobbyist might be offering a "last meal" in a manner he did not intend.

**One Last Live Meal.** Even riskier is the practice of feeding predatory fish a week's worth of "feeder" fish shortly before leaving on a trip. At best, they will all be eaten immediately and wasted, much like the standard foods overfed in the preceding example. More often, all the feeder fish are only killed, and their decaying remains foul the water, probably resulting in disaster. Even if they survive to be consumed on cue each day, the sudden change in fish load often upsets the ammonia/nitrite balancing act in the tank.

Almost as important as the health benefits for the fish are the psychological benefits for the fishkeeper. Most hobbyists take good care of their aquarium fish when they are home, and don't want to worry that their prized possessions are suffering in their absence. There's a lot to be said for peace of mind, and a vacation is a lot more fun when the aquarist is confident that all will be well upon his return. And if the

aquarium keeper is confident that the fish will be fed in his absence, he'll be less likely to overdo it before leaving.

**Friends.** Friends are great, and everyone should try to keep a few on hand. In a perfect world, every aquarist would have a nearby, trusted friend that is also an avid hobbyist, and is willing to stop by several times a day to feed and inspect the aquarium. In the real world, a friend possessing all of these qualities is hard to find, and neither a well-meaning novice nor an unreliable expert is a good bet to properly oversee the fish tank while the owners are away. An oversized feline stranger with a tall red&white striped hat is best rejected right off the bat.

## Coping With ALGAE and what you can do about it

**Is algae harmful?** For the most part, no. It is really more unsightly than it is unhealthy. Algae, like other plants, actually filters a lot of harmful chemicals like ammonia and nitrate from the water, making it *healthier* for fish. It also acts as a nutritious food source for grazing species. On the other hand, algae can be hazardous to live plants when allowed to grow on the leaves and block light.

**Is algae avoidable?** Generally not completely. Algae needs a handful of things to survive: carbon dioxide, oxygen, nitrogen, phosphorus, potassium and light. If a tank has all these things, algae will grow; if it's missing even one, it won't. Unfortunately, oxygen is required in a fish tank, and CO<sub>2</sub>, N, P and K are all products of fish waste. *Some algae will likely take hold in every aquarium.*

**Can algae growth be controlled?** Definitely; by reducing the amount of any of the above necessities, algae growth can be slowed. Light is the factor the aquarist has the most control over. If live plants are not used (more on plants in the next installment), reducing the intensity and/or duration of lighting will result in less algae. Likewise, fewer fish and careful feeding will reduce the amounts of N, P and K available.

**What about algaecide?** Aquarium-safe algaecide is not effective on many types of algae. It may work temporarily, but new algae growth usually springs back quickly after treatment, since algae essentials are still in the tank. Eventually all the susceptible algae dies out and algaecide-resistant strains take over, making further chemical treatment ineffective.

## How To Stop Overcrowding In Your Aquarium

There are two basic warnings that even most beginning hobbyists have heard: don't overfeed, and *don't overcrowd*. And yet many aquarists, of all levels of experience, have a natural tendency to try to squeeze "just a couple more" fish into their already heavily stocked tanks.

**Overcrowding means more maintenance.** Common sense dictates that more fish equals more waste equals more filter cleaning and water changing for the aquarist.

**Overcrowding leads to declining water quality.** Crowded tanks often have low dissolved oxygen levels, declining pH values, high nitrates, and ammonia and/or nitrate levels that rise daily after feedings.

**Overcrowding helps parasites.** In addition to lowering the fishes' resistance by poor water conditions, crowding also increases the odds that each disease-causing organism finds a host to live on.

**Overcrowding flirts with disaster.** No matter what the problem, crowding makes it worse. A power outage that wouldn't affect a healthy tank's population can wipe out a crowded tank in an hour. Minor cases of common diseases rapidly become epidemic in the crowded aquarium. An accidental overfeeding can put a crowded tank over the edge.

**How many fish is too many?** A pretty good rule of thumb is a *maximum* of a two inch fish for every gallon of water in freshwater, and perhaps half that many in saltwater. Larger fish should also be kept at one inch or less per gallon of water, since waste output and oxygen intake are related to weight, rather than length. Don't forget to plan ahead, some of those one inch cuties you just bought may someday become 10 inch hulksters.

**An alternate method** for determining whether or not a tank is crowded is to check water chemistry regularly. If your current tank maintenance routine results in low nitrate levels, zero ammonia and nitrite, high dissolved oxygen and stable pH, then you have a acceptable load of fish.

## How To Distinguish Between Sick and Infected Fish

Many aquarists assume sickness and infection are all interchangeable terms and go on to treat every fish that has torn fins, cloudy eyes, or abnormal swimming behavior with antibiotics or other medicine. This course of action is often unsuccessful or even counter-productive.

**"Sickness"** is a rather broad term, simply used to state that *something* is affecting the fish's well-being. This could be a parasite, bacteria, or other infective agent, but it could also be a water quality or temperature problem, organ failure, or even the aggression of a tankmate. For example, a "sick" goldfish might be swimming at the top of the tank because...

- it has gill flukes
- it's gills have been damaged
- there are high ammonia or nitrite levels in the water
- there is little dissolved oxygen in the water
- the temperature is too high
- another fish chases it whenever it comes down

Adding medication might be of value in some of these situations, but would be useless or could even worsen the others.

**Infection** is a much more precise term, referring to sickness that is caused by parasites, bacteria or some other organism that has taken up residence in or on the fish. Of the above six examples, only the first (gill flukes) is an example of an infection. Other examples are:

- White Spot Disease (Ich)
- Bacterial Fin Rot (Columnaris)
- White Cotton Disease (True Fungus)
- Viral Cauliflower Disease (Lymphocystus)

Medication would very likely help a fish with any of the first three infections (viral infections are virtually untreatable), but even then, care must be taken that the medication match the type of disease involved. All four of the above might be commonly described as "white spots" on the fish, even though they are caused by parasites, bacteria, fungus and virus respectively.

## How To Use Aquarium Salt As Medication For Your Fish

An almost forgotten treatment for many common freshwater fish parasites is **plain old aquarium salt**. Used properly, a saltwater bath can be very effective in eliminating "ich", velvet, *Trichodina*, *Chilodonella*, and a number of less common parasites.

**Advantages.** Salt treatments are:

- Very cheap - especially for large tanks or ponds.
- Effective on many different parasites
- Unlikely to put ill fish "over the edge"
- Safe for many species of fish
- Hard to overdose
- Unable to break down or get absorbed during treatment
- Unable to stain tank sealant
- Measurable (*Aquarium Pharmaceuticals' Salt Level Test Kit*)

**Disadvantages.** Salt treatments are:

- Dangerous to most plants
- Dangerous to certain fish (e.g. *Corydoras* catfish)
- Ineffective against gill flukes
- Removable only by water changes

**Best uses.** Salt is a treatment of choice for most pond fish, including goldfish and koi, which are somewhat sensitive to other common ich medications. It is also very cost effective for use in large bodies of water. In addition, certain ich-prone but malachite green sensitive species, such as "High Fin Bull Sharks" (*Arius jordani*) are easily treated with salt.

**Dosage.** Use one teaspoon of non-iodized (aquarium, canning, Kosher, etc.) salt per gallon of water every 12 hours for a total of three treatments (total dose: 3 teaspoons per gallon). For ponds or huge aquariums, use 1 pound of salt per 100 gallons every 12 hours for three treatments (total dose: 3 pounds per 100 gallons). In cases where parasites are overwhelming fish, full dose may be added at once

## Plants To Use For Regular Fish Tanks

You don't have to set up a "Natural Aquarium", complete with mega-lighting, CO2 injection, and Reverse Osmosis water supply to enjoy the beauty of living plants in the aquarium. Here are some favorites that do well under standard aquarium lighting and water conditions:

**Green Hygro** - *Hygrophila polysperma* - perhaps the most adaptable of aquarium plants, "Hygro" has light green leaves shaped somewhat like old airplane propellers arranged in pairs along a long vertical stem. It is usually sold as a bunch plant, and a pink-veined variety called "Sunset Hygro" is also available.

**Water Wisteria** - *Hygrophila difformis* - just as hardy as green hygro, but its lacy leaves give it a very different appearance. Available in bunches or sometimes in single stalks, Wisteria grows well even under the shade of other plants. If the stalks are planted horizontally, it can be used as a temporary foreground plant.

**Anacharis** - *Egeria densa* - also known as "Elodea", this plant's dark green color and rapid growth (up to an inch per day!) make it a best seller. Bunches are commonly sold for goldfish tanks, garden ponds, and for school science projects, in addition to those sold as aquarium plants.

**Corkscrew Val** - *Vallisneria "spiralis"* - one of the smaller of the grass-like plants, Corkscrew Val grows easily and reproduces by sending out "runners" from which baby plants grow. Eventually, a small "forest" of these twisted leaves takes over an area of the aquarium.

**Jungle Val** - *Vallisneria gigantea* - rather similar to Corkscrew, Jungle Val is much taller, wider, and with straighter leaves. It also reproduces by "runners", and is again easy to cultivate in quantity. Best for taller aquariums.

**Amazon Swordplant** - *Echinodorus bleheri* - another large but very hardy plant, the Amazon Sword makes a great centerpiece for larger aquariums, but can be kept in smaller tanks with moderate lighting for quite some time.

**Water Sprite** - *Ceratopteris pteridoides* - can be grown totally submerged, where it almost resembles celery, or floating, where its leaves look a bit fuller, perhaps like oak leaves, or emerged, where its leaves are thinner and more branhy. Its classic use is in guppy tanks, but thrives in most aquariums.

**Apongeton** - *Apongeton undulatus* - very fast growing plant with ruffled leaves, this common Apongeton grows from bulbs, which are sometimes sold barren as "Wonder Bulbs". After the period of rapid growth, plants often go dormant for a few weeks, then sprout up again.

**Hornwort** - *Ceratophyllum demersum* - this one's so easy, you don't even have to plant it! A branching stem plant with very fine, stiff, needle-like leaves, Hornwort develops no roots and simply floats at the surface of the aquarium.

**Good Luck & Best Wishes !**