

**Your Guide  
to  
Building A Healthy Aquarium**

**By Lin Stone**

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# Choosing The Best Aquarium



Let's face the facts first: There is no such thing as a "perfect" aquarium for your fish. Different pets have different needs, and even for animals of the same species, different breeds within the species have various physiological requirements that you'll need to cater to. Often though, adapting an aquarium to the specific needs of a type of fish is simply a matter of accessorizing once you're got the basic equipment down.

One of the first things you have to consider is the type of fish you'll be raising in the aquarium. There are subtle differences between a salt water and fresh water aquarium, so you have to buy one that's right for your fish. While fresh water aquariums are much more common and traditional, salt water aquariums are gaining in popularity due to people's wanting to raise unique brands of fish, and even go so far as to include live coral in their aquarium's decoration.



In either case, the first thing you need to do is to get an aquarium that's the right size for your fish. Ask at your local pet store when you purchase a fish what size of tank you'll need for it; take into account the number of fish you'll be placing in it, as well.

[Salt water fish](#) are usually more colorful than fresh water fish to start with. On top of that there are the colorful living rocks that are available to go into the salt water aquarium but can't live in fresh water. On the average a pound of living rocks must be added to a gallon of salt water to keep your fish happy. That gives a far greater range of color, size and texture to choose from as a living environment is created.

There are innumerable ways to set up salt water aquarium. One thing Steve Hand likes to do, especially in the store, is to keep a second tank beneath the display tank with the fish in it. Inside the second tank (down under and well out of sight, sound and smell, is all the necessary stuff -- like the filters and protein skimmer -- that would detract from the beauty people see in the display cases. Much of the beauty of a reef tank is the coral and other living organisms in the tank. The colorful fish add a splash of color, like adding a pinch of salt to a pot of soup. That's a pinch, not a pound. Keep the number of fishes down.

When you start deciding what size tank you want to begin with you'll want to take into consideration the weight of the total unit -- with the water. You'll also need to plan the type and placement of your light source.

Especially if you are starting with new rock you'll want to watch for ammonia or nitrite spikes in a new salt water tank. If you can get matured rock from someone else's aquarium you'll have less trouble. You'll be trying to establish a pH level between 8.0 and 8.2 while keeping the water temperature between 75 and 78 degrees F.

A steady draft can be good for your tank, once you have compensated for it, but if you have the tank right under the ceiling vent you'll need to take more precautions and more accurate measurements too.

In a salt water tank your carbonate hardness should be between 8.0 and 10.0dkh. If you have access to a good hydrometer you'll be looking for a specific gravity setting at 1.023. Plan on doing a 10% water change every two weeks too.

Does this begin to sound expensive, as well as daunting? Your basic small unit investment will start at \$775, and that's before you add your choice of fish and other beauty enhancers. Ideally you should expect to spend right at \$1,500 for a guest-pleasing salt water unit.

While some pet stores tend towards cramming large numbers of fish into a relatively tiny tank, keep in mind that this is because they are there for display purposes, and that those fish are sold off quickly so comfort isn't much of a priority. For the long run however, you want enough space for your fish to swim around without getting cramped.

Also remember that some breeds of fish are aggressively territorial, so you'll either want to place these fish in their own separate tanks or buy larger tanks that will keep them from fighting.

On the average, tanks should have water capacities of 20 gallons or more. Along with water capacity, you should also keep tank shape in mind... some breeds of fish prefer wide and long but relatively shallow tanks, while others prefer deeper ones.

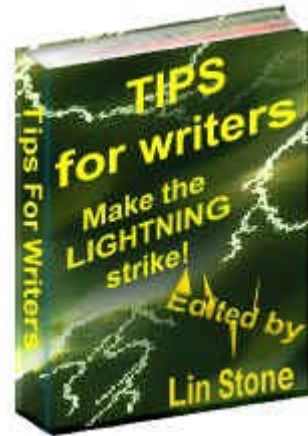
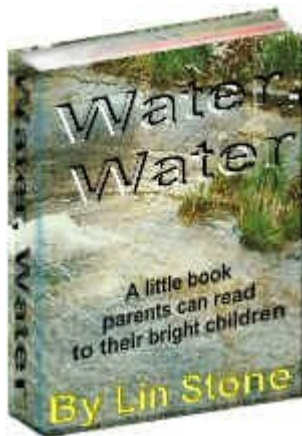
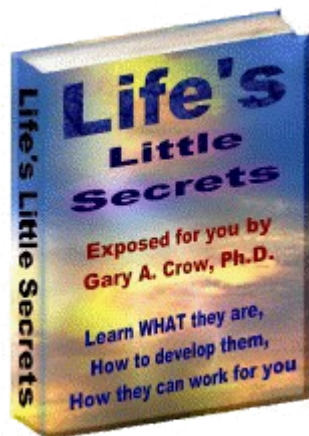
Aside from tank size and water capacity, another important consideration for an aquarium is the filter. The filter is the heart of the tank, keeping the water clean and filled with oxygen. Wet/dry filters with pumps are the most commonly used for aquariums, and these keep the water circulating constantly. They are also very easy to maintain, and relatively cheap.

Another type of filter is the gravel filter. These are more expensive, and are harder to maintain than regular wet/dry ones, but they provide a form of biological filtration which can be quite beneficial for your fish, removing harmful bacteria and even, to some extent, cleaning out small particles of algae from the water.

Third, there are fully biological filters which are composed of living and highly decorative corals and fronds grown in trays; while these are commonly used on full fish ponds, miniaturized versions are available for some larger aquariums.

These biological filters are the most natural and efficient way to keep your aquarium clean and air circulating, and they do the best job on cleaning out algae. This third type of filter system is probably the most appropriate for salt-water aquariums, as the differences between salt and fresh water isn't merely the addition of "salt" per se, but various minerals. There is also an entire ecological system involving ammonia and nitrogen that keeps salt water fish alive, and that requires biological components like marine plants to keep the cycle going. A biological filter will be able to keep the cycle within a salt-water aquarium going, and will keep the fish in it alive.

Lastly, aside from the tank size and filter/pump system, a good aquarium will also sport a heater system to keep the water warm and comfortable for the fish. While this may not seem important, remember that some breeds of fish are sensitive to colder temperatures. Tropical fish, in particular, will need to have an aquarium with a heater, especially when taken to a colder climate. But even with non tropical fish, keeping the water in an aquarium warm prevents the fish from getting sick - yes, fish get colds too, which is why you'll actually see fish "sunning" themselves sometimes near the water's surface in ponds.



# Heating and Lighting Your Aquarium

Light and heat are very important factors in an aquarium. Since it is an artificial environment, it is best to simulate natural conditions as much as possible to avoid having its inhabitants sicken and even die. For most people, having an aquarium means putting in the right water, providing the right food, and setting up a filtration and pump system that keeps the water that the fish breath clean and fresh.

While these are important factors themselves, the failure of most aquarium owners is to overlook the fact that lighting and heat are just as important to fish as the other things mentioned.

Lighting is extremely important because most fish except for deep water ones are used to seeing the sun, and it's a fact that, like any other animal, part of the nutritional needs of fish are physiologically triggered and released by exposure to sunlight. While admittedly not as high as the needs of non-aquatic animals, it is still there.

Light sources come in a variety of types. One of the most common and popular types is fluorescent lighting. Fluorescent lamps are cool, inexpensive, and easy to maintain and replace, and consume low power. For most aquariums, this is enough.

There are also classic incandescent lights, which consume a bit more power but provide brighter, if harsher, lighting. These also run hotter than fluorescent lights, and are better suited for raising tropical fish, which naturally would be more comfortable in brighter and more temperate surroundings.

Compact lights on the other hand, consume the least power and generate the least heat, but also produce the least illumination. They are best suited for people who want to raise deep-water fish or other breeds that prefer darker and cooler waters. However, if your aquarium has a high number of aquatic plants as well as fish, then you'll probably need a metal halide light.

Metal halide lighting mimics sunlight at a low intensity level, roughly that which would breach the surface of water in natural environments to reach the bottom where the fronds and other aquatic plants are located.

Metal halide lighting comes in a variety of intensities, and you should select one with a light and heat output that most closely approaches the natural environment of your aquarium's inhabitants, both the plants and the fish. You should be careful with metal halide lamps, and avoid choosing one with a higher output than your aquarium's needs; overexposure to sunlight on fish and plants that aren't physiologically capable of handling them can be as unhealthy as no exposure to it at all.

Aside from the lighting system, water heater coils and even filters with built in heaters are recommended equipment for any aquarium. For those who are serious about raising their fish, there are even heaters with a temperature setting and thermometer. Avid fish raisers will have done their research, and will know the exact range of temperature their fish will be most comfortable at. For casual fish raisers, however, a general rule of thumb is to have a low power heater that keeps the water lukewarm even in relatively cold weather.

Use two heaters for larger aquariums, one at either end to ensure even distribution of water temperature. This is very important. If only one side of a tank is hot, then the other remains cold and can cause thermal shock when your fish swim from one side of the tank to another. To put it in human terms, imagine spending an entire summer day inside an air-conditioned room, one cold enough to require wearing a jacket to keep the chill out. Then, after a while, leave the room once you're become acclimated to the cold, and step outdoors into the blazing sun. THEN, once you've gotten used to the heat, jump back into the cold room. Obviously, this will eventually make most people sick. The same thing applies for fish.

Lastly, consult with your pet shop about the heater's output. The larger the fish tank, the larger the heaters you'll need to install. Heaters are measured not by their temperature output, but by their power consumption, which directly relates to their heating performance.



By This Same Author

# All About Filters

Building, adding to, and maintaining the integrity of an aquarium can be both exciting and challenging. The process of duplicating the beauty of the underwater world can be difficult, but once carried out successfully, can add to the beauty of your home, and even the increased interest of your friends and loved ones in the life of the creatures of the sea. Making sure that this controlled environment stays clean and danger-free, however, is harder: you need to make sure that the chemistry of the water, the nature of the aquarium, and the microorganisms all come together to keep your fish happy and healthy.

Aquarium filters are part of this controlled system of a replicated environment, in that they keep out harmful microorganisms and chemicals. On their own, however, aquarium filters can only do so much: you will need to clean your aquarium regularly to scour out harmful fungi, which can prey on your fish and their young offspring. You will also need to change your aquarium water, and even test its pH and salinity levels if you are maintaining a marine aquarium.

## How Water is filtered in the Aquarium

There are actually three major methods of filtration. In mechanical filtration, an aquarium filter removes large materials, usually debris or waste, by keeping them out of the water and allowing them to rest on a filter. Such a filter may be made up of spongy material, floss, or a metal screen. Waste and debris usually consist of fish excrement, or gill exudations, both of which contain large amounts of ammonia. This ammonia is converted into nitrate, which can kill fish if such ions are present in the water in large amounts.

Chemical filtration involves treating the water with chemical agents that can remove harmful molecules from the aquarium environment. Adding carbon or zeolite to filters carries this out. Biological filtration, on the other hand, is the most important method of filtration, and is used to ensure that water quality in the aquarium remains high. Beneficial bacteria, which are made to grow on filters so that they can metabolize or digest waste, or molecules and compounds that would otherwise be harmful to fish carry out such filtration.

## The Different Kinds of Filters Available

If you are interested in buying an aquarium filter for your aquarium, there are different sizes of filters to suit your needs, and the kind of fish that you want to keep.

A corner or box filter is made up of plastic, which houses filter carbon and floss that are linked to an air pump. This is commonly used in simple house aquariums.

The UGF or under gravel filters are fitted onto the bottom surface of the aquarium, and are placed under about an inch or so of gravel. This filter is linked to an air pump, and is kept on regularly. Canister filters, on the other hand, hang onto the side of an aquarium, and will house an internal pump that is connected to a sealed container. This container traps waste and debris from the aquarium water. Fluidized bed filters, like canister filters, hang on to the wall of the aquarium. This time, however, they pump water up and into the water through fluidized materials.

Wheel filters, such as the BIO-Wheel, are fitted onto the back of the aquarium. These filters draw water up from the aquarium bottom with the help of a siphoning tube, and then drain the water back into the aquarium. The drained backwater is filtered through a pad that contains carbon, sponge, floss, or zeolite. Such a filter also allows beneficial bacteria to grow on it, allowing these bacteria to process harmful wastes and debris from the aquarium water. Such filters require constant maintenance, and filter pads need to be changed at least once every three to four weeks. The siphoning tube also needs to be cleaned inside and out.

If you are keeping baby fish, you may need sponge filters. The density of the sponge keeps the light and delicate baby fish from being sucked and drawn into the filter. The sponge also allows small plankton and other food to grow on its surface, where baby fish can nibble on them easily. Baby fish, however, can also be easily trapped under sponge filters, so the sponge filter shouldn't be on the aquarium bottom.

Filters are only one way to keep an aquarium clean, but they are essential to the health of your fish and the other inhabitants of your aquarium. If you are interested in purchasing a filter, consult with your local pet store or aquarium accessories distributor, and choose a filter that fits your needs and budget. You will soon enjoy the benefits that your aquarium can offer, whether it houses a few common fish, or many rare and colorful species.

## **Setting Up the Aquarium**

### Easy Ways of Setting Up an Aquarium

When thinking about a hobby to pursue, many people turn to reading or writing, or probably pursuing a new sport. Still others might turn to keeping pets. But even when pets are involved, rarely do people opt to have fish, most of them would choose to have dogs or cats or even bunnies. Although hairy and cuddly pets are highly therapeutic, this doesn't diminish the fact that fish can equal this effect. So if you are undecided whether to buy that white bunny or to keep some cute fish, better read this first.

When you would want to have fish in your home, what is the very first thing that you should consider? Of course, the fishes' home! Aquariums come in many varieties and they also come with different accessories. Here are the most common but useful tips in setting up your new pets' home:

1. Before barging into the nearest pet shop, be sure to know what type of fish you want to keep in your aquarium. Another thing to consider is, can my choices of fish live together or will they eat each other? Know which ones can live symbiotically.
2. Prepare the aquarium together with all the other equipment that you are going to use. It is highly advisable that you start out with an under gravel filter. Also, be sure to provide ample lighting by putting a fluorescent lamp on the aquarium's plastic top. A heater and an air pump will also be necessary purchases.
3. As soon as you have the fish tank (aquarium) make sure you wipe it clean with freshwater and sponge. Wipe it dry.
4. Mount your choice of background. Be creative. Make sure to put in the design that will match all the other accessories and equipment (and your mood, too!).
5. Prepare to put the tank on its stand. As soon as you are decided on where to best enjoy your aquarium, level both the tank and the stand. Just be sure that the tank is away from direct sunlight, as this will greatly increase the growth of algae.
6. If you have purchased an under gravel filter, make sure to place it as soon as you have set up the tank on its stand.
7. Next, put two lift tubes (this is when you are using an air pump) in their sockets. If you have a power head instead of an air pump, then one lift tube would be sufficient.
8. Put in the gravel. Make sure to wash the gravel thoroughly before putting it in.
9. It's now time to put in the heater and the water pump. Be sure to place the water pump above water level (for safety reasons).
10. For starters, you can begin practicing a tank set up by using plastic plants, wood and stone decors instead of using the 'real thing' immediately. Get a 'feel' of how to keep an aquarium balanced. If you are bolder, then you can opt to have live plants and real rocks. Now it's time to set them all up inside the tank. Remember that plastics float once you put the water in so don't be dismayed to

see them floating all around. To avoid this, make sure that they are weighed down by gravel.

11. Put in water but the water treatment should only be added when the tank is full.

12. You should be ready to test your mini-marine world. It is highly preferable that you test the aquarium for a couple of days before purchasing the fish that will go in it. Once the tank is operating smoothly, it's time to add in your choice of fish.

13. Welcoming home your pets doesn't end your commitment in keeping them. In fact, everything has just begun. Be patient in the next couple of weeks as this will test whether you can begin the cycle process.

Now that you have set up your new hobby, it is time to sit back, relax and enjoy the view. Looking at your new pets can have a calming effect on you that will sweep away the hours, even days that you've spent in setting up your new pets' home.

## **What is the Nitrogen Cycle?**

Why it's Important to know the Nitrogen Cycle in your Aquarium

Any living organism on the face of the planet needs the process called the nitrogen cycle (yes, that would include you!). Although this is so, not too many people actually know what nitrogen cycle is and why it is highly important in keeping many biological progressions. By definition, nitrogen cycle is the process of nitrogen and nitrogen-inclusive compound transformations.

The earth's atmosphere comprises 79% of nitrogen. Although nitrogen is a major part of the planet, most living organisms can't use it in its crude form. Plants are only able to use it once it is in its fixed form (examples are nitrate ions, urea and ammonia). Once the animals feed on plants that have these forms of nitrogen, then they, too, can have the nitrogen in their bodies.

When it comes to keeping an aquarium, nitrogen cycle means there are bacteria in your fish tank that convert the ammonia into nitrites and, eventually, into nitrates. Since this is so, it is necessary for you to learn to cycle your tank. It takes weeks to cycle your tank and it would be safest to say that you have finally established a safe environment for your fish when the nitrates are finally present and the nitrites and ammonia are at level zero.

There are four major processes that contribute to the nitrogen cycle: nitrogen fixation, decay, nitrification, and de-nitrification. Nitrogen fixation involves three other processes to break apart the inert nitrogen molecule (lightning or the so-

called atmospheric fixation, biological fixation or industrial fixation). There are certain bacteria that are responsible for the nitrogen fixation: they are the symbiotic bacteria, anaerobic bacteria (free living) and the cyanobacteria (also known as the blue-green algae).

Decay, simply put, means nitrogen is produced in the form of ammonia through the excretions of plants (yes, plants also poop) and animals. In the case of fish, the more fish that you have in a small tank, the higher the chances of getting toxic levels of ammonia in their environment.

With nitrification, the plants can actually take ammonia in but the decay-produced ammonia is transformed into nitrates. There are two steps in nitrification and they are when:  $\text{NH}_3$  is oxidized by Nitrosomonas to become nitrites and when nitrites are oxidized by microbacters to become nitrates. These two types of bacteria that were mentioned are the so-called nitrifying bacteria. These bacteria make it possible for the plants' roots to use up nitrogen. In some cases, there are soils that contain archaeal microbes that turn ammonia to nitrites. There are also a lot of legumes that undergo nitrification.

Denitrification is the process that replenishes the atmosphere of the nitrogen gas. In this case it is, again, the bacteria that do the work. Anaerobic bacteria use up nitrates in their respiration, which finalizes the nitrogen cycle.

Now that you know why nitrogen cycle is important, it's high time for you to know that it is also the 'main ingredient' in making amino acids, nucleic acids and proteins—all are essential to human existence. And as if these aren't enough, perhaps you would appreciate the nitrogen cycle more if you knew that it is also an essential part of RNA, DNA and chlorophyll.

Now that we have that established, it's high time we go back to keeping the aquarium safe from having toxic levels of ammonia. It's as simple as this—fish naturally live in an environment where the ratio of water to fish is astronomical. But when you start out with your fish tank, this ratio is diminished and so are the chances of keeping the water safe for your pet fish.

To avoid toxicity in your aquarium, be sure to test it. You should be alarmed when the test kit is able to measure any amount of ammonia in your fish tank. A safe level should be when the test kit can't gauge the ammonia.

It will take time for you to get a handle on being a real aquarium owner. It takes patience and love of the new hobby to establish a new home for the fish. When this is achieved, processes such as the nitrogen cycle in your fish tank will be as easy as A-B-C!

# What About Algae

When you are an avid aquarium keeper, you should be able to relate when it is said that algae is a major nuisance in keeping the fish tank 'pleasant' to view. Once a small patch is seen, it only takes a day or two before you can see that it is starting to overwhelm the delicate balance of your aquarium. Although algae are usually considered an eyesore, we can't prevent the fact that they will grow in your fish tank whether you like it or not.

It's important to know the types of algae that can grow in your aquarium. It is important for you to know that there is a certain type of algae that can be left alone. This is the green type of algae. It will start as a small, slimy patch then when left alone it will grow into something like hair (green hair, that is!). Be appeased when you have green algae in your aquarium. This means that you have established a healthy environment for your pets. Now the problem is how to control it and prevent it from overwhelming all the other species in the tank.

If your new aquarium is plagued by the brown or red algae, then it is most probable that you have a problem in your fish tank's water quality. The red or brown algae normally appear in new, saltwater aquariums only. They are seen often on the corals.

Another type of algae-like organism is the diatom (and these are the hardest to clean!). These ones appear like dots. These diatoms have hard shells and they cling to the tank. When not cleaned, green algae would start to grow on it.

You should be highly alarmed when your aquarium becomes a habitat for cyanobacteria. This slimy stuff grows much faster than the common algae. Although it is easy to clean, cyanobacteria can grow back just as easy. Once there is an infestation of cyanobacteria in your aquarium, it is best to control them right away. The best way to do so is to clean the corals in your fish tank thoroughly.

There are ways of controlling algae in your aquarium. Aside from cleaning regularly, it is also important to place the aquarium as far away from the window as you possibly can. Having a direct sunlight hit your aquarium will mean faster growth to the unsightly algae. If you have to place your aquarium near a window, make sure to put blinds or thick curtains that would protect the water from a direct hit of light. You can open these drapes or blinds during the evening.

Another way of controlling algae is to limit the amount of lighting that your fish receive in a day. Of course, lighting is necessary for them to develop Vitamin D in their bodies but too much lighting will surely hasten algae growth.

To avoid this risk, make sure that you turn on the 'fish lights' to no more than ten hours in a day. Make sure to turn them on or off during the same hours each day.

If you would like to resort to algae-eating creatures, then there are certain snails and fishes that you can purchase which would 'clean up' the tank for you. Just make sure that they do not overpopulate. Remember that the more fishes you have in a small tank, the higher the chances that the ammonia would reach toxic levels.

There are some apparatus that can be installed to control the growth of algae. These include ultraviolet sterilizers and algae scrubbers, also equipment that do ozonation, resin exchange, or reverse osmosis. If you are willing to do so, you can use distilled water in your fish tank.

There are many ways of controlling algae but bear in mind that preventing them from recurring would be futile. Algae are a normal part of an aquatic habitat. It is, after all, not dirt but just an unsightly growth in your tank. All you have to do is to learn to control it and manage a habitat that is healthier for your pet fish.

## **Keeping the Aquarium Clean**

### The 5 Best Tips in Keeping your Aquarium Clean

If you are one of those fish-lovers on the planet (and by that, we mean you keep an aquarium and you don't eat those pet fish!), then you obviously know the joys of keeping a fish tank in your home. Then you could also attest to the problems that plague aquarium owners. Along with the many joys that you experience in keeping an aquarium come the problems like algae growth, establishing a healthy environment (no ammonia in the water) and also food 'leftovers' that make the water dirty.

When you are plagued with these problems, be assured that there are also numerous solutions that you can turn to. Let's just tackle them one by one:

1. For general aquarium dirt (that's inclusive of the algae and fish poop), it is always advisable to purchase an aquarium filter. Although this may cost you more than you have expected, still, the results are long term.

Having a water filter will mean that there will be less 'major cleaning' for you. And by major cleaning, we mean having to remove the fish and the accessories out of the water and scrub the tank itself. When you have a water filter, you will be tasked with just the simple cleaning of the filter itself. And this has to be done regularly. It will take time before you do another major cleaning. If you do decide to invest in a water filter, just make sure that you know how to properly clean it. If you are stuck with a product that you don't know how to clean

chances are, you can do more damage to the delicate balance of your aquarium. There are several types of water filters: the internal filter, the power filter, the inline or canister filter, and the wet/dry filter.

2. If your aquarium is plagued with algae, it is important to keep the tank away from any of your windows. Remember that when the aquarium is exposed to light, there is also more algae growth. If you're depending on fluorescent lights, then it is important for you to know that it is also detrimental to have those lights turned on more than ten hours. Another way to control algae is to introduce animals that eat up algae in your aquarium. The Chinese Algae eater is a good choice. Just make sure that you have them when they're young because they become too aggressive when they turn into adults. If you don't want to risk your other fishes' lives, then you can rely on the good ol' snail to do the job for you. If you can't wait for days before the alga is removed, then you can purchase algae scrapers. There are also other equipment in pet shops that introduce reverse osmosis and ozonization in your fish tank.

3. Another problem is fish poop, right? Well, with this, the solution is fairly simple. When you put in the gravel on your aquarium floor, make sure that it slants towards the front. This way, you will be better able to see the fish dirt that has accumulated. Never put in too many spaces between the gravel, as it will be 'home' for fish poop that you won't be able to see.

4. This is, perhaps, one of the simplest tips—don't add more fish to your aquarium than it is able to house. Remember that more fish in your fish tank will require more water. But since aquariums have limited water supplies as compared to the fishes' natural habitat, it is imperative to keep the number of fish at a tolerable level. More fish in your tank will produce more poop. When this happens, ammonia will inevitably be introduced into your tank.

5. When the water in your tank turns yellow or brownish, don't be alarmed. The plants in your tank might cause the color. Yellow water doesn't necessarily mean dirty water. The most normal interval in cleaning fish tanks should be 2-4 weeks. Before two weeks would mean your tank is too clean but beyond the four weeks, the environment could be toxic to your pet fish.

Cleaning a fish tank can be tedious but as an animal lover, you do know that the simple burden of cleaning is nothing when compared to the joys that fish will bring. Don't you agree?

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# 7 Questions to Ask Yourself before Buying Fish

1) Salt Water or Deep Water fish? - Fish generally fall into these two categories. For the sake of simplification, beginners should raise fresh water fish, as these are much less demanding in terms of equipment required and effort involved in raising them. Salt-water fish are recommended for experienced aquarium owners, but have the added advantage of allowing their owners to place other decorative salt-water life forms, like living coral and starfish, in their aquariums.

2) What size of fish should I choose? - This goes hand in hand with the question of aquarium size. The bigger the fish, the more food it will eat and the more water it needs. Beginning fish raisers should choose small yet highly decorative fish like guppies or goldfish, or maybe a pair of midsize tropical fish as their pets. Large, grumpy, and demanding fish, like arwanas, are best left to experienced fish raisers.

3) How many fish am I raising? - Again, this goes along with the question of fish size. If you're raising multiple fish and are a beginner, try raising only one breed of fish, and pick one that tends to travel in schools. Raising a lot of fish that are solitary or, worse, combative or predatory in nature is a good way to quickly depopulate your aquarium. If you want to stay on the safe side, raise two fish, a mated pair, in a relatively small sized aquarium and you should do fine.

4) What are the eating habits of that fish? - There are two kinds of processed fish food available: plant and animal based. Naturally, you want to buy one that's appropriate for your fish's diet, whether it's an herbivore, carnivore, or omnivore. If you're not sure about the different brands of fish food, pick an omnivore for easy maintenance. It doesn't stop there however; fish are also divided into shallow surface feeders, bottom feeders, or ones that eat while swimming around the middle of a tank. Fish foods, to address these differences, are also divided into the types that float on the surface of the water, settle quickly to the bottom, or float down slowly yet are light enough to be kicked up again with a bit of turbulence (for middle-feeders).

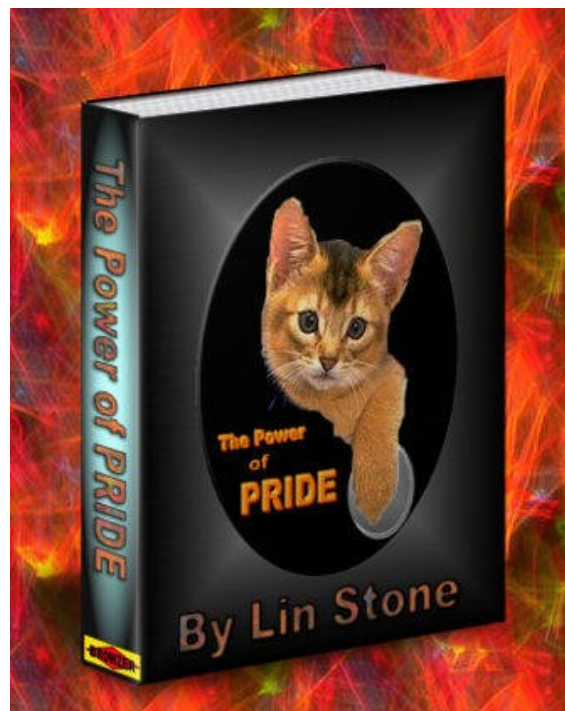
5) What is the natural environment of that fish? - Aquariums come with a variety of extra gadgets to ensure the comfort of your pets. Water filtration systems, heaters, and lighting are important to keep your fish healthy. Knowing the natural environment that your fish are suited for can help you choose which equipment to

get. Tropical fish, for example, thrive in warm waters and aren't adverse to sun exposure, so using a good heater and a lighting system which simulates sunlight keeps them healthy and happy. Deep-water fish and underwater cave/reef dwellers, on the other hand, will prefer cool temperatures and minimal lighting conditions.

6) Is the fish territorial? - If you're getting more than one fish, this is a very important question to ask yourself. Some fish are very aggressive and highly territorial, like lionfish, so they will need larger aquariums to keep them out of trouble. Furthermore, avoid mixing breeds of fish that tend to look at each other as natural enemies or a food source. For example, raising a school of guppies in the same tank as an arwana is tantamount to telling the arwana to eat hearty and have a nice time...

7) What other things can I include in the aquarium? - After selecting what breed of fish you want to get, you can throw in little things to make it more comfortable. Salt-water aquariums are great places to put living corals, and this provides salt-water fish with places to sneak into to doze off. Fresh water fish aquariums can be decorated with fronds that will help the oxygen supply in the water, and even help to filter nitrogen build up from decomposing fish excrement, which can be poisonous to fish. Without a good filter system and/or plants to naturally clean the water, your fish will be living in the human equivalent of toilet, kitchen, and bedroom in one. Definitely not a cozy thought.

We will discuss environment and other important information about your fish in upcoming chapters.



# Feeding Your Fish

## Guidelines for Fish food

With thousands of different species of fish around the world, it's nearly impossible to match the exact dietary needs of every fish in your aquarium, and even more difficult to exactly match their food in the wilderness.

However, by following a few common guidelines, you can keep your fish in good general health, and they will eventually adjust to the new diets you provide. While these guidelines won't work for fish with highly specialized diets, this information is meant to handle the dietary needs of a vast majority of freshwater species.

One of the greatest developments in fish care is the development of dried, high nutrition fish foods that can generically feed most breeds of fish. These come in a variety of forms, from pellets to flakes. These dried fish foods, no matter the form they take, will provide equal nutrients to your fish. The biggest factor to consider between flakes, tiny granulated bits, or larger pellets is the actual eating habits and size of your fish.

Use flakes for feeding your smallest fish, granules for feeding midsize fish, and pellets for the larger breeds. These sizes are made for the mouths of various fish, and it's best to stick to the type suited for your fish; aside from the obvious difficulty of feeding a tiny fish like a guppy with a pellet that's as large as its head, flakes, meant for tiny fish, will often be ignored by larger fish.

Fish food is also differentiated into "sinkers" and "floaters", meaning they will, once dropped into water, tend to either sink slowly towards the bottom of the tank, or keep floating upwards towards the surface. Get a type that suits the natural eating habits of your fish; bottom-feeders will need sinkers; shallow water fish will often prefer floaters.

If you're unsure about the eating habits of your fish, experiment with both types and find out which they prefer. This is more than just a matter of instinct for your fish; some breeds of fish have mouths that are unsuited to feeding on the surface or bottom of the water, so even if they tried to bite at the food they would be unable to do so.

Another consideration for your fish food is their dietary pattern. Are they plant eaters, carnivores, or omnivores? Fish food generally comes in plant or animal based varieties, meant to supply nutrients for herbivores or carnivores.

If your fish are omnivorous, you won't have much of a problem, though you'll probably have to buy both kinds of fish food to keep your pet's diets nutritionally balanced. Feeding an herbivorous fish an animal based fish food or feeding a carnivore plant based fish food will both result in eventual death, as your fish won't be able to digest it.

Over and under feeding fish is also a source of problems if you're not careful. Both can cause your fish to sicken and die, though for different reasons. Underfed fish will grow thinner and weaker, and be more prone to disease. Overfed fish, on the other hand, won't be directly unhealthy; the problem lies in the excess fish food that remains floating around the tank. Unconsumed fish food will decompose, and mix with the fish's excrement (which will also be at a higher level in the tank than it should be) and poison the aquarium's environment past the filter's ability to handle.

On the average, a good rule of thumb is to feed your fish three times a day, using amounts that will get fully consumed in about 5 minutes. Also keep in mind that some fish are diurnal, others nocturnal, so you may have to separate the two or add a fourth feeding time per day to make sure all your fish get well fed.

Lastly, remember to "spice up" your fish diets with occasional treats, which would be to feed them the real things they would consume in nature. Dried seaweed or chopped aquatic fronds for herbivores, and little earthworms and insects for your carnivores, will keep your fish healthy and happy.

Admittedly, while they will suffer no real ill effects from never eating anything but processed dried fish food, they WOULD get bored eventually, and long for the food that they are instinctually suited for. A few finicky breeds of fish have been known to starve themselves to death, refusing to eat fish food after a while unless they get a bit of "real" food from time to time. Throwing in "real" food for your fish about once a week keeps this from happening.



# What Are Invertebrates

Invertebrates are, simply put, animals without spines. While this may seem to be only a few types at first glance, it's actually surprising that over 90% of the total different species of animals in the world are invertebrates. While a majority of the well known and most common species of animals on the planet have backbones, like mammals, birds, and reptiles, quite a few other life forms are born without spines, and have alternative means of sending their neural signals or physically giving their internal organs a framework.

One of the most basic forms of life, protozoa, has no backbone. These are tiny, single-celled organisms like bacteria, and their microscopic size alone is enough reason for them not to require a spinal column. Taking this form of life and going a step up in size, we've got annelids, which are creatures whose bodies are segmented and whose internal organs are efficient enough that you can cut them in half and both halves will grow into a separate annelid. The most well known example of an annelid is earthworms.

Aside from having NO spine or bone whatsoever, other invertebrates instead DO have bones in their bodies, but their physiological arrangement is different from vertebrates. Echinoderms are a mainly aquatic example of this. Echinoderms are creatures whose internal organs are arranged at the center of their bodies and, from this center, they grow spiny protrusions that radiate outwards to protect the soft, vulnerable central core. Starfish and sea urchins are examples of this. Due to the arrangement of their spines echinoderms aren't built to be highly ambulatory.

Other invertebrates in the ocean include mollusks, which similarly have a soft central core but, instead of protecting it with spiny outgrowths like echinoderms, they rely instead on a dense and heavy outer armored shell. Clams and oysters are the most common example of this, though mollusks aren't restricted to seagoing life forms. The snail is likewise a form of mollusk. Mollusks are a bit more mobile than echinoderms, often employing one organ dedicated to propulsion. The snail has a single foot that secretes fluids on which it slides forward, and clams have small tubes they can stick out of their shells to squirt out water in a tiny jet that pushes them around.

The ocean seems to hold the greatest number of invertebrates, as there are also SOFT skinned mollusks like squid and octopus. Given the fluid nature of water, soft, shell-less mollusks give up the protection offered by their hard-shelled versions in favor of sheer mobility. They actually have appendages, often quite a large number of them, and their musculature is much stronger than hard shelled mollusks yet designed for full flexibility to take advantage of their underwater habitat.

Shells, however, are a common defining factor for another type of underwater invertebrate, the crustacean. The biggest difference between a mollusk and a crustacean is the lack of a central core. Crustaceans actually have a main body which houses conventional internal organs like the heart and stomach and they actually have a head, and even appendages like legs and claws. Crustaceans are probably one of the best known form of invertebrate, as most of them wind up on a lunch or dinner plate; like crabs, shrimps, and lobster. Oh yum....

Finally, moving out of the water, we get to the MAIN reason why invertebrates actually outnumber vertebrates on the planet. Insects. Bugs. Spiders. Creepy, crawly little things... call them what you want, but insects are actually one of the most hardy and efficient life forms on the planet in terms of sheer physical power and survivability. Insects get by without a spine by forming hard exoskeletons that cover their entire bodies. Their bodies are made up of a head, a thorax that houses most of the internal organs, and an abdomen. Their appendages are likewise covered by their exoskeletons. The muscle arrangement of insects within their exoskeletons actually gives them some of the highest strength to body weight ratio of any species of animal on the planet. Similarly, their internal organs are denser, and function so effectively that some toxins and even radiation don't affect them as much as vertebrates, so that it's been held that, in the event of something like a nuclear holocaust, they actually have the highest chances of survival.

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# Accessories to Delight Your Fish



Whether you are keeping a marine or freshwater aquarium, you will want to not only delight people who see your aquarium, but keep your fish happy as well. Your fish have just been snatched out of their natural habitat, and can suffer trauma if they aren't handled gently. The least you can do is find ways to amuse them, and keep their stay in your small tank as easy and enjoyable as possible.

You will need to get aquarium decorations and accessories to not only delight your fish, but keep them healthy as well. Although they may seem useful only as ornaments, aquarium pebbles actually facilitate the oxygenation of aquarium water, and allow for the growth of beneficial bacteria that will help filter out harmful microorganisms that can prey on your fish.

## Light, Heat, and Filtration

Another important aquarium accessory is your filter, which should remove harmful organisms from aquarium water. Your fish are especially susceptible to fungal infections, and an aquarium filter can keep them safe. If you are keeping a marine aquarium, you will also need a lighting and heating system.

Your fish have a built in biological clock, or Circadian rhythm, that governs their sleeping and waking patterns. This biological clock operates on light and dark cycles; so consult with your local aquarium merchants on the duration of these cycles so you can properly adjust your tank's lighting system.

Marine corals and beneficial algae survive on the basis of light and dark cycles, as well as on carefully controlled water temperature. Most marine fish, moreover, are caught off the shores of tropical countries, where the water is warmer. You need to acclimatize your fish by controlling the temperature of your water.

### Decorations and Amusements

You can keep your tank colorful by adding decorations, such as stones or statues to your tank. As mentioned earlier, pebbles and stones, especially porous ones, can help beneficial bacteria grow in your tank, and can help distribute oxygen throughout your aquarium's water. Just be sure to select pebbles that are sterile and free from fungi; if possible, have your local aquarium merchant sterilize your pebbles and stones before you introduce them to your tank.

You can introduce replica towers or buildings to your tank, especially those with large holes and doors so your fish can swim through them. Pagodas and temples are common decorations, as they have many grooves on their surfaces on which beneficial bacteria can grow. They also have multiple tiers and openings, as well as nooks and crannies in which fish can hide. Aquarium castles can also provide amusement for both you and your fish. Some castles function as water filters or oxygenators, and can have a drawbridge that signals the accumulation and release of air bubbles. Just be sure to clean out any aquarium castles or replica temples regularly to keep fungi from growing in your tank.

Static decorations can also be beneficial for your fish tank. They should have little channels and hiding places for your fish. If you also house crabs and small invertebrates, these decorations can give them lodgings as they clean out your tank. These decorations can come in the form of fake driftwood, skeletons, corals, or even flowers.

If you can afford it, buy decorative rocks or caves that have multiple holes and hiding places. It can be amusing to watch fish dart in and out of these holes; if you have blue or low lighting at night, you can also observe fish find places to sleep in these caves. Because replica caves and rocks are porous, you should clean them out regularly and keep them free from harmful fungi.

There are other aquarium ornaments, decorations, and accessories available on the market to delight both you and your fish. There are fake sea creatures that can double as amusement and filters. Some aquarium decorations can be programmed to light up at certain times, or to illuminate certain portions of the tank with the flick of a switch.

Treasure chests can also double as oxygenators, sending up bubbles of air every time they open.

For a complete list of available ornaments and accessories, consult your local aquarium accessories merchants. Be sure to clean your tank out regularly and replace your water. Select only accessories that are bought from reputable merchants who have control over the quality of their wares. Your fish need to be happy and contented in their new home, and they need the best accessories to live well and flourish.

## **About Saltwater**

### Marine Madness at Home? All About Saltwater

In ancient Rome, it was considered fashionable to keep sea anemones in glass jars filled with saltwater. These were the first saltwater tanks, and although they were short-lived, they became the precursors to a modern hobby that has fascinated aquarium keepers and enthusiasts alike. Keeping a saltwater aquarium can be fulfilling and challenging, in that the saltwater tank has to be maintained constantly, but can house many interesting deep-sea organisms that a freshwater tank would otherwise reject.

In the early days of marine aquarium maintenance, enthusiasts collected saltwater at the beach. This practice introduced parasites and pollutants to tanks, and often killed expensive marine organisms. Today, marine aquariums contain chemically defined saltwater, which is tested for safety and salinity levels before being introduced to the tank.

### The Marine Aquarium

A marine aquarium tank is usually made of glass or acrylic. It can be placed on a stand or built into a wall. It will also contain equipment for chemical, biological, and mechanical filtration, along with lighting and heating equipment. All these pieces of equipment are essential in keeping the environment of the marine aquarium as close to that of seawater as possible.

There are different kinds of marine aquarium fish keeping methods. The FO, or fish only tanks will contain only marine fish, along with some pebbles to coat the aquarium floor. In the fish only with live rock system, or FOWLR, fish are kept along with microorganisms that are present in live rocks, such as essential algae, invertebrates, and bacteria. The reef tank will contain sea anemones, delicate marine invertebrates, and corals, and will have a carefully controlled lighting system.

## The Marine Filtration System

Because marine aquarium tanks will often accumulate large amounts of microorganisms, and because the carefully controlled pH levels of the water can also be inviting to microorganisms that can damage marine organisms, a filtration system is necessary to maintain a marine aquarium. There are various methods of filtration suitable to maintain the integrity of a marine tank, and all these methods will combine chemical, biological, and mechanical filtration.

Simple hang on filters can contain plates where beneficial bacteria can form their colonies. These bacteria provide biological filtration, and they shouldn't be cleaned out or expunged, as they provide a healthy biological balance in the marine tank. Larger marine aquarium tanks will also contain bio-filtration media; sometimes, large amounts of live rock can provide their own biological filtration, although molds and fungi can often damage live rock. As a result, marine aquarium enthusiasts and merchants recommend protein skimmers, which can introduce bubbles into the marine aquarium tank. These bubbles mimic the action of wave foam, and will contain waste products, saltwater, plankton, and essential nutrients.

## Lighting and Heating

Although lighting may seem to be more vanity than a necessity, many marine systems actually need a cycle that balances light and dark hours. This simulation of day and night is essential to maintain the Circadian rhythm of the fish in the tank, an inner biological clock that determines periods of sleep and waking. This biological clock also governs other aspects of fish health. Strong lighting, moreover, can encourage the proliferation of coralline algae, which is important in fish with live rock tanks.

Many marine fish are caught in tropical regions, where the water is warmer than it is in temperate regions. These fish have to be established in a tank that mimics the native temperature of their saltwater, so most marine aquarium tanks also need to be heated. Although some cold-water marine fish are also available, they are generally not as colorful or attractive as warm water marine fish.

## Saltwater and the Best Marine Environment

Saltwater should be tested before it is introduced to a marine aquarium. Specific gravity is important, as it determines the ion balance in the water. In general, a specific gravity of about 1.020 to 1.024 can be suitable for a fish only tank. A specific gravity of 1.023 to 1.026 is good for supporting the growth of corals and invertebrates. Salinity is also an issue: salt should be at a level of about thirty parts per thousand, and can be measured with a refractometer.

The pH or acidity of the tank should be at about 8.1 to 8.3, which is more alkaline than ordinary water. This can be maintained through the use of buffers, a calcium-rich substratum, or commercially available chemical mixtures. Saltwater also needs to be buffered, and monitored for levels of ammonia, which is toxic, and which is converted to nitrate. Marine animals excrete ammonia into the water through their wastes or gills; bacteria pick this up and convert it into nitrate; the algae and corals use this nitrate to function. Although this balance is ideal, it is difficult to maintain, as nitrates may accumulate faster than algae and corals can take them up. Nitrates are toxic to fish, and can be removed only by changing the water. If you are interested in maintaining a marine aquarium, then make sure that you have all the knowledge necessary to have one. A marine aquarium can be a challenge to build, difficult to maintain, but an enjoyable sight to observe.

## **What to Feed Your Fish**

### A List of Food for your Pet Fish

One of the most satisfying hobbies on the planet (and probably one of the most relaxing, too!) is keeping an aquarium. The joy of looking at the crystal clear water with live fish and plants is truly enjoyable. And with this joy comes the tank cleaning and fish feeding. Although it is highly important to establish a good environment for your fish, it is also equally important, though, to know what to feed your fish. You may have the most beautiful aquarium on the block but you aren't assured that your fish will last long if you aren't careful with what you feed them.

The major rule in feeding your fish is to know what type or species your fish belongs to. Do thorough research. If you know what type of diet your pet fish should have, then it will be easier for you to scout for the food among pet shops or in the market. Remember the classification of animal diets (herbivore, carnivore and omnivore)? Fish also fall under these categories. There are fish that can only feed on algae flakes and who would shun, say, shrimp flakes. These are the herbivores (examples are Molly, Silver Dollar, Pacu or Tropheus) that also prefer to eat vegetable pellets or flakes and spinach. The carnivores (Archerfish, Banjo catfish, Bettas, Hachetfish, Frontosa, or Killifish) are the ones that prefer worms and small insects. Here's a great hint for omnivore fishes (Armored Catfish, Blood Parrot, Discus, Convict, Goldfish, Gourami, or Guppy): although they eat almost anything on a fish diet, they do prefer live foods.

Next to knowing what diet your fish should have, it is also important to make a balanced diet for your pet fish. Just like humans, fish also need a variety in their diet.

Protein is the most important part in a fish's diet. Since this is so, it is important to remember this when looking for fish food in pet shops. Look for those foods that have fishmeal or shrimp on their labels. The lowest nutrient in your fish's food should be fat. Just like humans, too much fat could damage their liver. Be sure to include some fiber in their diet, too. Just a little is sufficient.

If you are a fishbowl keeper or one of those who are contented with just small tanks, then it is a must for you to feed your pet fish with just flakes or the freeze dried bloodworms that are available at most pet shops. The key here is to feed fish in small tanks with flaky fish foods. Also, be sure to give them just a pinch of flakes each time. If they are able to gobble them up immediately, then you can give another pinch, and so on. Food that isn't consumed will go down to the bottom of the tank and will cause pollution. Also, remember not to overfeed your pet fish.

Flakes normally have a shelf life of just one month. If you feed your fish the flakes that are more than a month old, they could be more susceptible to illnesses because of the loss of nutritional content. Again, choose a variety of flakes so that your fish has a balanced diet.

For larger fish in larger tanks, the best food would be fish pellets or floating stick food. These pellets provide more food mass for larger fish. If you aren't a fan of freeze-dried foods, then you can opt to have them fresh. Worms, insect eggs, and even small insects such as ants are a good feed to some types of fish.

Other than the usual flakes, pellets and floating stick foods, there are also other freeze-dried fish foods that can be bought at most pet shops. Most of these foods include tubifex, krill, or river shrimp.

Now that you know all about the different types of food, it is also important to know that fish recognize immediately who feeds them regularly. At the sight of food (even if you have just fed them), they would leap to get a mouthful. Again, remember not to overfeed them! You can 'over love' them but never, ever overfeed!

## **Fish Diseases and Treatment**

### **Common Aquatic Fish Diseases And Their Corresponding Treatments**

Many think that fish are ideal pets because they are easy to take care of and maintain. Just give them food every day and you won't have any problems, such as vaccinations, arthritis, etc. Many believe that fish can never have worms, parasites, constipation, and much less tuberculosis! Oftentimes, fish owners just shrug their shoulders when they see their fish floating upside down, thinking that it is just the time for their fish to die.

However, unknown to many, fish also contract diseases like any other animal. Believe it or not, fish experience constipation, allergies, worms, parasites and even tuberculosis too.

### **Most of the time, you are the cause of the diseases of your aquarium fish.**

Poor water quality, inadequate nutrients, inappropriate food variety, infrequent cleaning of fish tank or bowl, or lack of an air pump are the primary causes of common diseases.

Before you buy another aquarium fish, it is advisable that you read the list of common fish diseases and corresponding treatment below so you will know how to properly take care of your precious aquatic friends when they are sick.

#### White Spot or Ich Disease

The disease that is easiest to detect is the white spot disease. The white spots all over the body of your fish are actually parasites called *Ichthyophthirius*, or Ich for short. This condition is caused by either poor water quality or fish stress. A fish that is under stress usually has a poor immune system and is susceptible to different kinds of diseases, including Ich disease.

If the disease is left untreated, your fish will lose their appetite and will be scraping their bodies to surfaces in futile attempt to get rid of the parasites. You will also notice that the breathing of your fish will be heavy or difficult. If you don't do anything to help your fish, it will eventually die of stress.

White spot disease should be treated immediately. At the first sign of white spots, you need to go to the pet store and buy proper medication. Even with constant treatment, it might take several days before the parasite is completely eradicated. When the parasites are in the cyst form, which is attached to the fish, medication won't work. Only when the parasites are free flowing in the water are they susceptible to treatment. That is why, regular tank cleaning is needed to prevent further outbreak of Ich infection.

#### Fungal infection

Your fish may be suffering from body fungus if you see that its skin or gills are splotched with white or grayish patches that resemble wool or cotton. If left untreated, the fungus will attack the skin of your pet and will cause ulcerations. Your water-born friends might die if you don't do anything about this infection.

Since fungus grows in water that has large concentrations of decaying matter, such as rotten food and fish refuse, you need to regularly clean the fish tank in order to prevent fungus from developing. Body fungus is quite easy to treat, so don't worry. Just go to the nearest pet shop and buy medication.

You can opt to use an all-encompassing anti-bacterial medication, or just something that treats body fungus.

### Fin or Tail Rot

You should check the fin, tail and body of your fish every day. The slightest change in the length of its tail or form of its fins should be cause for alarm. If you see that your fish is a bit sluggish, stays at the bottom of the tank, doesn't want to eat, and has noticeably shorter tail and fins, then your pet might be suffering from tail or fin rot. The rotting of fins, tails or even bodies causes bacteria. Stress makes some fish more susceptible to the disease. Fin or tail rot can also be due to poor water quality or can be a secondary infection.

You will be able to secure treatment for such a disease in almost all pet stores. Utmost care in following the treatment instruction is needed. If you use a lower dosage of the anti-bacterial medication, you are making the bacteria resistant to the drug. Moreover, you should also do something about the underlying cause of the disease. If you see that small fish are bullied by bigger fish, then it may be wise to buy a new tank for your small fish.

Fish diseases are almost always easy to cure if treated in their early stages. So the next time you see changes in the appearance and movement of your fish, don't shrug it off. Immediately go to the pet store and buy appropriate medication.

## **Fish and Invertebrates to Avoid**

Aquariums, both the freshwater and marine types, have become a growing hobby worldwide that translates into hundreds of millions of dollars in yearly sales. From the pets to aquarium structures and from setup materials to the gadgetry needed to keep aquariums functioning properly, big money is channeled to the industries that supply and support this hobby. But the most delicate and expensive aspect of the aquarium hobby as a whole lies not in the structures but in the kind of pets that owners put in their aquariums.

As a beginning enthusiast, you must carefully choose the kind of fish and invertebrates you put into your tank because putting these creatures in captivity not only affects the biodiversity of the environment from which they came from, they can also hurt your wallet in a very big way. As a beginner, it is always a

good idea to keep your hands away from exotic and unfamiliar species of aquatic animals. For reasons that involve the environment, delicateness of the species, financial requirements and overall harmony inside your marine or freshwater aquarium, some fish and invertebrates must be avoided.

The following list identifies a number of fish and invertebrates that must normally be avoided by beginner aquarium hobbyist like you. And unless you have the money to burn and the patience to care for these organisms, these species are better off left in their natural habitat or some veteran hobbyists' fish tanks. Read on and understand why.

### Fish To Avoid Putting In Your Aquarium

Paddlefish can be a potential headache for a budding aquarium enthusiast because these fish can grow beyond two meters in length. You will need a large space and a large aquarium if you plan to start your hobby with a paddlefish. To top it all, paddlefish require an abundance of live small crustaceans like Daphnia as food. Paddlefish require huge amounts of funds for a pet.

Some varieties of aquarium sharks like the iridescent shark and the paroon shark can both outgrow the length of common aquariums. While they aren't picky as to the food they eat, they are hungry most of the time and they will eat other fish in your aquarium that can conveniently fit inside their mouths. These miniature sharks, which are actually a variety of catfish, usually require a lot of room to swim in.

Next on the list is the Pacu. This fish originated from South America and is a close relative of the piranhas, which in turn have a notorious reputation of tearing off flesh from its victims in the wild. While Pacu may be a great aquatic pet, a beginner should avoid it. A Pacu may not be as aggressive as its cousins in the wild but its jaws are potential hazards especially for children because it can easily rip human fingers, adult and youngsters alike.

### Invertebrates To Avoid In Your Aquarium

First on the list of invertebrates that you must avoid putting in your aquarium as pets are nudibranchs or slugs. These invertebrates are described as completely unsuitable for home aquariums. If large public marine tanks find it difficult to take care of nudibranchs, the situation could be worse for a beginner like you. Nudibranchs are very delicate and they have special feeding requirements; to make matters worse, there is only a little information about nudibranchs available.

While many nudibranchs or slugs are beautiful and attractive as pets, they are in effect impossible to care for in home aquariums unless you have adequate knowledge of their requirements particularly food and living conditions.

Next, a beginner aquarium hobbyist must stay away from harlequin shrimps. True, there are a lot of beautiful shrimp that can be great pets; however, harlequin shrimp are difficult to look after, as they require starfish as their only food.

Another invertebrate that can cause a lot of headaches for a beginner enthusiast is the octopus. An octopus is very difficult to keep in captivity aside from the fact that its life span is very short. A very intelligent creature, an octopus always escapes from aquariums.

Lastly, always keep in mind that anemones aren't appropriate for beginners' aquariums. For one thing, anemones require a lot of strong light and superior quality of water in the aquarium. Therefore, if you don't have money to spend on lighting and water purifiers, it is best to forget about anemones until you have gained enough experience in the aquarium hobby.

The end

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