

pH—A Guide



What is pH?

The pH of water is a measure of whether the water is acid or alkaline. pH is measured on a scale between 0 and 14. A simple pH test can reveal if the water is acidic (less than 7), neutral (7.0) or alkaline (above 7). In nature, the pH of water is the result of its surrounding ecosystem – for example rainforest streams are usually acidic, but waters in former volcanic areas are alkaline (eg Lake Malawi in Africa).

pH is important

The right pH for one fish might not be suitable for another species of fish. Therefore it is important to keep species together that prefer similar water chemistry. For a typical community tank of mixed fishes, a neutral pH is usually the best solution.

The effect of pH on fish

Many fish can adapt to a wide range of pH, but if the aquarium water is too acid or alkaline it can severely stress your fish or even kill them. Sudden large adjustments to pH can also harm fish. For example, fish living in a tank that has had a gradual pH change over some weeks might all seem fine, but newly added fish might die soon after being released. Fish suffering from pH shock can look diseased (frayed/clamped fins, slime on body, gasping, loss of appetite).

Another example of a pH-linked problem is when the aquarium water is very alkaline (such as for African Cichlids) but also has ammonia present: Ammonia becomes very toxic at high pH and this can quickly lead to fish deaths.

How often to test

It is important to test pH on all tanks at least weekly, and also immediately if you are concerned about the health of your fish.

Expert tip: Checking the pH in your tank is an important first step in diagnosing any fish problem.

How to test

Testing is easy. The most accurate method is to use an electronic pH meter, but meters do need recalibrating every

few weeks to keep them accurate. Another popular and easy way to test is using a liquid indicator test kit: simply add some pH indicator to a vial of water and compare to a colour chart. pH test strips are also simple to use, but are not as accurate as the other methods.

Recommended pH levels (Freshwater Fish)

	pH	Species
Acid	6.0	Wild Discus, Wild Bettas
	6.8	Neons, Captive Bred Discus, Most Dwarf South American Cichlids, Cardinals, Most South American Tetras, most Killifish and Hatchet Fish
Neutral	7.0	Many Common Community Fish, including: Angels, Corydoras Cats, Aust. & N.G. Rainbowfish, Central & Sth American Cichlids, Rasboras, Pencil Fish, Pictus Cats and Elephant Nose
	7.2	Goldfish, Clown Loach, Kuhlii Loach, Siamese Betta, most Sharks, Danios, most Gouramis and most Barbs
Alkaline	7.5	Most Livebearers, Celebes Rainbow, Half Beaks, Bumble Bee Goby
	7.8	Scats, Archer Fish and Monos
	8.0	African (Rift Lake) Cichlids

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Factors affecting pH

Water with a **low carbonate hardness (KH)** has a lower buffering capacity, meaning it's pH is more likely to vary from week to week. For example, Melbourne's very soft tap water has low carbonate hardness and therefore has a low buffering capacity. Aquarium water with low KH tends to gradually become acidic over time as fish waste and other organic matter builds up.

By comparison, some parts of Australia have **high amounts of dissolved minerals** in their local tapwater. Such water is very hard and tends to stay alkaline. It can be difficult to reduce the pH in these conditions for any length of time.

Even acidic or neutral water can become too alkaline if the **wrong material** is added to the aquarium. The following items all cause pH to rise and should not be put in a freshwater tank if you want a neutral or low pH;

- coral/marine sand,
- shell grit,
- sandstone,
- coral,
- shells,
- marble, and
- cement. (Unsealed new cement ponds are deadly to goldfish as the new cement causes the pH to rocket to extremely alkaline.)

Having a lot of **Carbon Dioxide (CO₂)** in the water (eg overcrowded tanks) can cause the pH to drop. Ensure plenty of good aeration by filter or airstone to prevent this from occurring.

Adjusting pH

If you are having to regularly adjust the pH in your aquarium, it is best to analyse the problem, find the cause, and take a long-term approach to fixing it. Any large pH corrections must be performed slowly, to avoid pH shock to the fish.

The following methods can be used to help **decrease** pH:

- using pH acid powders (pH down) / pH regulators,
- adding driftwood,
- adding washed Peatmoss (place in a filter bag in the filter).

Importantly, check nothing in the tank is causing the pH to rise (eg shells, coral, sandstone rocks).

Decreasing pH can be difficult if your tapwater is naturally high in dissolved minerals, as this can quickly counter any attempts to reduce pH. In extreme cases, the addition of R/O water (Reverse Osmosis) or distilled water is recommended to soften the water to allow for adjusting pH.

Increasing pH is easier to do. Using substances with high levels of calcium will increase KH and therefore the buffering capacity; this will cause your pH to rise and become more stable.

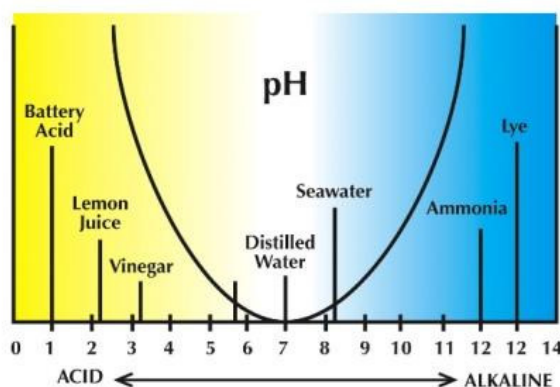
Any of the following can be used to **increase** pH:

- using pH alkaline powder (pH up) /pH regulators,
- adding a small amount of coral sand,
- shell grit or shells,
- regular water changes (use a gravel vac).

Recommended Reading

Just starting out? You can download more tips like this at aquariumindustries.com.au. We recommend the following, all kept on the "General Care" page:

- Setting up a Freshwater Aquarium
- General Hardness
- New Tank Syndrome
- Community Fish & Aquariums



pH range