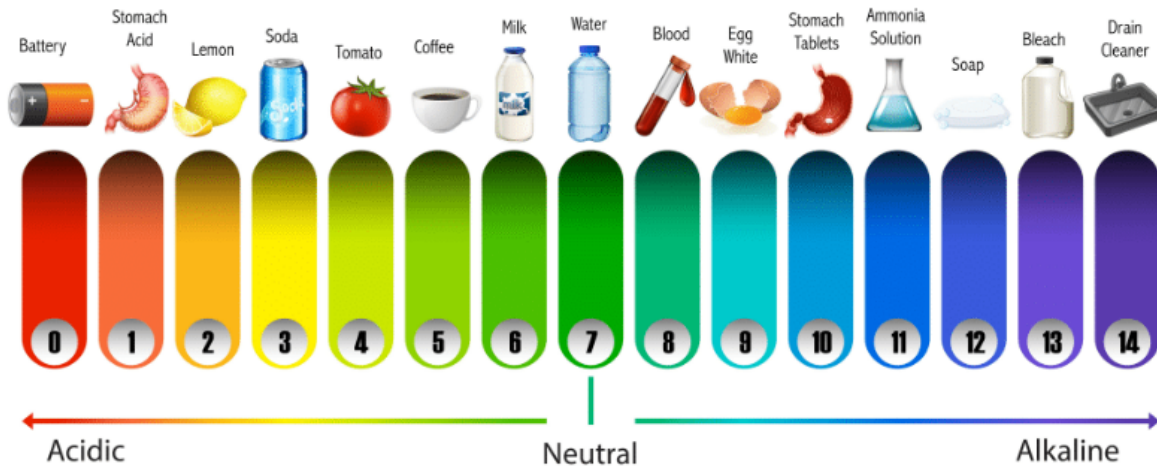


## pH

It could easily be argued that pH is the most important water parameter in fish keeping. Understanding pH, knowing how to measure and correct it is a vital skill that every aquarium\pond keeper should acquire.

The pH scale runs from 0-14 with 7 being neutral. A pH less than 7 is referred to as acidic. A pH greater than 7 is alkaline.

Lemon juice has a pH of around 2.3 therefore it is acidic. Bleach has a pH of 13 and it is an alkaline.



The scale is logarithmic meaning each number indicates an increase of ten times the value of the one that proceeds it. A tomato is 100 times more acidic than milk. Bleach is 100,000 times more alkaline than blood!

Water that has excessively low or high pH values will not be suitable for keeping fish. Water with a rapidly fluctuating pH levels will cause high stress levels. It is therefore necessary to monitor your water on a regular basis to ensure it is acceptable.

The pH level imparts no odor or visual impacts on the water clarity. There is only one way to determine pH and that is with a test kit or electronic probe. Personally I would suggest an inexpensive test kit such as the Tetra pH Test.

A quick word of caution regarding test kits in general is to avoid the DipStick based tests. Although cheap and simple to use I have not found them to be reliable. This may be due to them getting damp or drying out either way I have little confidence in them. Good test kits will have a test tube and liquid reagent.

To use the Tetra kit add 5ml of water to the test tube. Then add 7 drops of the reagent. Agitate tube. Compare your result with the colour card that's provided. It could not be more simple to use.

Most pond fish such as Koi or Goldfish will be perfectly happy with a pH in the range of 6.5-8.5. Water that is slightly acidic, neutral or slightly alkaline. Hardy tropical aquarium fish (bread and butter community) will also be perfectly at home within a similar range.

Certain species of fish will have more specific requirements and will do better in water that better meets those requirements. For example Dicus thrive in water that is soft and slightly acidic. African cichlids prefer harder water with a pH that is slightly alkaline.

Weekly or fortnightly testing pH can help spot problems developing and give you time to take corrective measures before it becomes serious.

## **Problems with pH and what to do about them.**

All biological activity in your aquatic system is slowly consuming carbonate minerals and producing carbon dioxide which in water form an acidic compound. It is inevitable that water will eventually turn acidic if these minerals are not replaced.

In short, everything living in your pond or tank is trying to make your water turn acidic.

A very common issue with pH is known as a pH crash (sudden drop in pH), and this can be extremely dangerous for the fish. This is when the pH suddenly drops dramatically.

pH crash often occurs during the nighttime because plants start releasing extra carbon dioxide.

pH crash can be a major problem in soft water areas where the water is severely lacking carbonate minerals and has very little in what is referred to as buffering capacity.

pH crash often occurs during the winter months when the pond is being topped up by heavy rainfall. Rainwater is soft in nature and lacks the necessary minerals. In general using rain water to keep a pond topped up is not a good practice for this reason.

To prevent the pH from crashing we need to maintain a level of carbonates. This can be done by adding treatments of KH buffer (bicarbonate of soda) easily available from aquatic outlets.

I would also recommend that you add a quantity of crushed Oyster shells to the filter or pond. Oyster shells slowly dissolve if the water is acidic and raise the buffering capacity.

Regular water changes are extremely useful and maybe all that is required to prevent this problem.

pH crash can have devastating consequences, but it is easy to remedy and prevent.

The opposite of a pH crash can also occur. There are circumstances where the pH can become dangerously high.

A high pH in a fish tank could be the result of an unsuitable substrate such as crushed coral or limestone based aggregates.

In a garden pond excessive amounts of landscaping mortar (cement) in direct contact with water has been connected with this issue. Similarly this use of large quantities of limestone rocks or aggregate.

Algae and plants also have an influence on the pH. In certain circumstances during the day algae absorb carbon dioxide from the water to help grow cells and this can raise pH quickly. At night when photosynthesis stops the carbon dioxide is released dropping the pH.

Checking the pH at different times can easily detect these fluctuations. For some fish the stress caused can be problematic.

It is never a good idea to allow an excessive amount of plants or algae to grow in aquariums or ponds. Un desirable pH affects are possible as is the high potential for a low oxygen problem.

Should you decide to lower pH there are safe over the counter treatments available. Before using them I would read the instructions carefully and adjust the pH level over several days.

**Extra notes to consider.**

You should also read up on KH. Understanding the close relationship between carbonate hardness and pH will be extremely useful.

If you are ever asked on a trivia quiz what does pH stand for your best answer would be “Potential Hydrogen” although “Power of Hydrogen could well be the answer the quiz master is looking for so take your pick.

It can be hard to convince any pond or aquarium keeper to test their water. However most health issues are water quality related and testing just pH and nitrite would often be all that is needed to spot a developing problem.

Check your pH regularly!

**You may find these YouTube videos interesting.**

