

Fishless cycling

Understanding how the nitrogen cycle works is simply the most important lesson any fish keeper will learn. You must have some understanding of this cycle before you consider purchasing and tropical or pond fish. The nitrogen cycle is a chemical reaction that takes place in our aquariums and ponds when certain toxins are present. Basically two forms of bacteria establish colonies not only on the bio media but all over the aquarium or pond, it is these bacteria (nitrobacter and nitrosomonas) that convert deadly ammonia and nitrite into less harmful nitrate.

Dependant upon which filtration system you have chosen you will have some form of biological media i.e ceramic rings, plastic ring, within your filter. This bio media will provide an enormous amount of surface area in which beneficial bacteria can grow. As well as growing on our biological media these invisible bacteria grow on all surfaces in our ponds and aquarium from plants to rocks. The problem that we face as fish keepers when setting up a new aquarium or pond is that these beneficial bacteria are not present or only present in small numbers meaning we have to introduce toxins in to the pond/aquarium water before they colonise. The problem with introducing toxins such as ammonia into our water is that it is dangerous to and fish living within it. We have two choices as fish keepers firstly using **hardy fish to cycle our pond or aquarium** or we introduce a chemical form of ammonia from a bottle and monitor its conversion to nitrite then to nitrate. Only when ammonia is instantly converted to nitrate can we assume that the filter is mature.

To enable you to cycle your aquarium or pond you will need a good reliable test kit that tests for Ammonia (NH₄/NH₃), Nitrite (NO₂) and Nitrate (NO₃) and some pure ammonia. The most difficult part of fishless cycling your fish tank or pond is finding a good reliable source of ammonia. The ammonia used should be free of any additives such as perfumes, colorants or surfactants. The best places to look for pure ammonia are a hardware or grocery store with the cleaning supplies. If you are unsure whether it is pure ammonia do not use it for cycling, and additives may be harmful to fish, pure ammonia is clear and when the bottle is shaken no foam will form at the surface.

Next ensure that your aquarium and ponds filter/pump is running and turn you heater (if you are keeping tropical fish) up to 80°F this will help the bacteria establish themselves more quickly. If it is possible add a cup full of gravel or piece of bogwood etc from an established aquarium, this will contain colonies of beneficial bacteria which will speed up the process. Once you have managed to source your ammonia add to the aquarium or pond until you get a reading on your ammonia test kit of 3- 5 ppm, it s difficult for me to tell you how much ammonia this will require due to different manufacturers having different concentrates of ammonia in their products.

Once you have a reading of 3-5 ppm on your test kit stop adding and test daily for ammonia and nitrite, you will eventually start to see a nitrite reading, once you get a nitrite reading and your ammonia has started you decrease add more ammonia on a daily basis, at this point check regularly for nitrate readings. Eventually you will be able to add ammonia and it will convert instantly to nitrite, typically you will start to see very high nitrite readings and little or no ammonia.

Soon after you will have high nitrate readings and no ammonia or nitrite readings, this is when your aquarium or pond is mature and you can start to introduce fish.

Once your aquarium has cycled complete a large water change to dilute the high nitrate levels it may be necessary to complete a 50% water change using de chlorinated water in order to bring these levels down. This whole process is time consuming and can take anything from a few weeks to a few months. Be patient although it is time consuming it is the safest way of cycling your fish tank or pond.