

## The Nitrogen Cycle and a “Balanced” Aquarium

**The nitrogen cycle is important for having a balanced aquarium.**

*By David A. Lass*

As has been said often – the nitrogen cycle is the key to keeping tropical fish in aquariums. Besides the tropical fish and aquatic plants in an aquarium, there are other living things – the “good” bacteria – that change deadly ammonia into slightly less deadly nitrite, and then nitrite into nitrate, which can be used by aquatic plants and removed when you do your regular water changes. The key to making the nitrogen cycle work is that there is a balance of the tropical fish, aquatic plants and bacteria in the aquarium.

The difficult concept to explain, and to understand, is that the goal of cycling and then maintaining a successful aquarium has to do primarily with having enough food for the tropical fish, who make enough waste/food for the ammonia>>nitrite bacteria, who make enough waste/food for the nitrite>>nitrate bacteria, who make nitrate that is used by aquatic plants and removed by a water change. The problem comes when there is any kind of major change in the available food for any of the bacteria of the cycle. This is a little different from most ideas, where the concentration is on having enough bacteria, and places for the bacteria to live and grow – but the bacteria can’t live without a food source. The point is that in the process of establishing the nitrogen cycle, while we don’t want to do harm to tropical fish by spiking ammonia and nitrite, you can’t starve the bacteria. This is why my preference is to add a few tropical fish at a time, and to feed enough that the cycle gets going but the tropical fish are not distressed. There are no really good “rules” for this, which is why fishless cycling is so much in vogue today.

Whichever way you get the nitrogen cycle going, and as you add tropical fish to the aquarium, please keep in mind that it is all of the life in the aquarium – tropical fish, aquatic plants and bacteria – that you are feeding. Keeping all of these in balance is the real key to a good aquarium.