

## Biological Basics

Aquarium filters can be mechanical (sponges to collect debris), chemical (to absorb specific toxins) or biological (to break down fish waste). Good biological filtration, along with healthy plant growth (see our Plant Basics care sheet) is the key to a healthy and sustainable aquarium.

### **Biological Filtration**

In order to maintain fish health a good quality biological filter is required to breakdown toxic aquarium waste products such as fish waste, uneaten food, decaying plants, etc. This process is commonly referred to as the 'nitrogen' or 'nitrification cycle' and refers to the establishment of beneficial bacterial colonies which break down waste products into less harmful compounds. There are three stages of the nitrogen cycle (ammonia > nitrite > nitrate), and every new aquarium goes through this process. ***Failure to understand this process is the largest contributing factor to fish loss in aquariums.*** In a new aquarium (or new filter) there are not enough beneficial bacteria to eliminate all toxins immediately, so for a period of two to six weeks, steps need to be taken to reduce risks to fish health. Fish & Feather recommends the use of Nutrafin "Cycle" to help cycle a new aquarium or when adding new fish.

### **The Three Stages of the Nitrogen Cycle**

#### ***First stage, Ammonia:***

Fish waste forms ammonia, which is highly toxic to most fish. In a new aquarium ammonia usually begins rising by the third day after introducing fish.

#### ***Second stage, Nitrite:***

As nitrite-forming bacteria (nitrosomas) develop, ammonia is converted to nitrite and while ammonia levels drop, nitrite levels rise. Nitrite usually begins rising by the end of the first week after introducing fish.

#### ***Third stage, Nitrate:***

As nitrate-forming bacteria develop (nitrobacters), nitrite levels fall and nitrate levels rise. When nitrates are being produced and ammonia and nitrite levels are zero, your tank is fully cycled and your biological filter is fully functioning (from 2-6 weeks). In low levels nitrates are not highly toxic to fish. Routine partial water changes should keep nitrate levels within a safe range.

### **Tips**

- Your filter is ultimately only as effective as the media it contains. There are many types of biological media on the market and it is important to select a media which has a high biological capacity (see our staff for further information).
- Do not add large numbers of fish to your aquarium at any one time in order to enable your filtration bacteria to slowly adapt.
- Regularly test your water for ammonia, nitrite & nitrate levels to ensure your biological filtration is sufficient, you are maintaining it appropriately & your aquarium is not over stocked or over fed.

***Feel free to contact the friendly staff at Fish & feather for further information***

We recommend:



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# Nitrogen Cycle Basics

