

# SOMETHING FISHY, INC.



## Something Fishy University Extension Courses The Nitrogen Cycle



### What Is the Nitrogen Cycle?

In aquaria-speak, the "nitrogen cycle", or more precisely, the *nitrification* cycle; is the biological process that converts ammonia into other, relatively harmless nitrogen compounds. Like all living creatures, fish give off waste products, notably ammonia ( $\text{NH}_3$ ) which is highly toxic to most fishes. In nature, the waste is diluted in the large amount of water, and eventually absorbed or broken down. In aquariums, it can take as little as a few hours for ammonia concentrations to reach toxic levels.

### How much ammonia is too much?

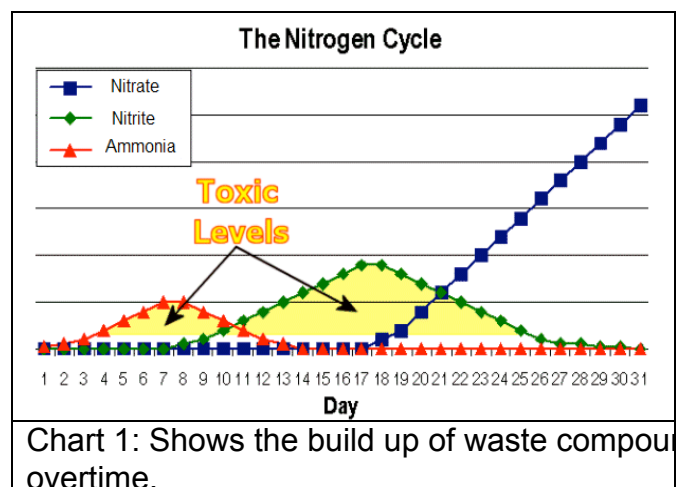
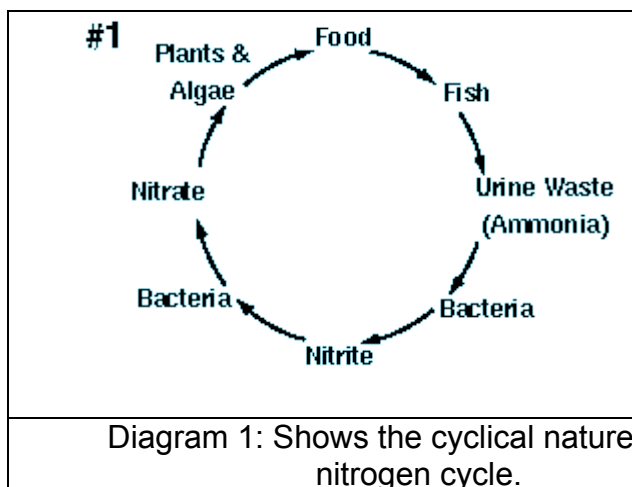
The quick answer is: if a test kit is able to measure it, you've got too much. Even small amounts are enough to stress fish. Consider emergency action (water changes) to reduce the danger. You should continue to test for ammonia until your readings are 0.

### How do I break down/remove ammonia from my aquarium?

Fortunately, several species of bacteria do this conversion for us. Some species convert ammonia ( $\text{NH}_3$ ) to nitrite ( $\text{NO}_2^-$ ), while others convert nitrite to nitrate ( $\text{NO}_3^-$ ). Thus, cycling the tank refers to the process of establishing bacterial colonies in the filter bed that convert ammonia  $\rightarrow$  nitrite  $\rightarrow$  nitrate. The aquarium is considered "cycled" when Ammonia is at 0 and nitrates are climbing. A water change should be done to reduce Nitrates at this point.

### Where do I get bacteria to cycle my aquarium?

The desired species of nitrifying bacteria are present everywhere (e.g., in the air). Therefore, once you have an ammonia source in your tank, it's only a matter of time before the desired bacteria establish a colony in your filter bed. The most common way to do this is to place a few hardy fish into the aquarium; no more than 1" per 5 gallons of aquarium volume. There are commercially available bacterial cultures that can be used to expedite the process. Experienced hobbyists sometimes use a piece of decaying food to cycle the aquarium.



If your having problems with the nitrogen cycling in your aquarium the following can be helpful:

Use a water conditioner such as prime: this helps speed up the bacterial process and sooths stressed fish.

Perform small daily water changes without touching the gravel base or changing filter pads. This removes toxic water without disturbing the bacterial bed.

Don't add any more fish until the problem is corrected.

Keep feeding to a minimum, ensuring to remove any un eaten fish food.