Aquarium Nitrate Trouble

Bonus content from the August 2009 FAMA magazine column "Freshwater Forum."

By Jeffrey C. Howe

Q. I have a 29-gallon fish tank, which has been set up for three months. I have been having problems with the nitrate level in the tank. The nitrates are high and usually test between 80 and 100 mg/L. I have done traditional things to reduce the nitrates, such as not overfeeding, daily water changes and periodic cleaning of the gravel to remove fish waste.

I sometimes lose between two to four fish in a week. The pH is steady between 6.7 and 7.0. The ammonia is zero and there is no chlorine, as I use the appropriate amount of dechlorinator. I also use some salt in my tank on the advice of the pet store where I bought my tank and fish.

I am currently trying a product called DeNitrate, which is added to my filter as a media to help reduce the nitrates and ammonia. I was wondering if this product works, and if this fails to work, is there is anything else I can do to reduce the chemical levels to a safe level?

I have 13 fish, including guppies, mollies and zebra danios, in my tank. The water temperature stays between 78 and 80 degrees Fahrenheit. In addition, I use the lighting system provided with the tank and usually use it later in the afternoon and throughout the night. I use a flake food and all the fish appear to get their fair share, which is completely consumed within minutes. If by some chance a fish is not getting their share, how can I tell they are not getting enough?
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A. Housing a total of 13 fish, consisting of guppies, mollies, and zebra danios, is well within the bioload capacity of a 29-gallon tank as long as it has cycled properly and the filter is working properly. But right off the bat, it sounds as though your tank has not completely cycled. The cycling process can sometimes take as long as six to eight weeks. Consequently, I would suggest that you not purchase any additional fishes until the tank has completely cycled and the nitrates are under control. When new fish are purchased, only a few small fish should be introduced to your tank at any one time so as not to produce spikes in the ammonia level because the existing nitrifying bacterial colony is not yet sufficient to handle the new introductions.

Although you stated that the ammonia level registered zero, what about the nitrite level? Ideally, both the ammonia and nitrite levels should be maintained at zero and the nitrate level at 20 ppm (parts per million) or less. With nitrate as the end product of the nitrogen cycle unless there are live plants present in your tank, the nitrate level is easily maintained by conducting weekly water changes. The fact that you are conducting daily water changes and your nitrate level is still between 80 and 100 ppm, implies that something is not right. Actually, performing daily water changes (I don't know what percentage of the water is being replaced during each water change event) could be inhibiting the cycling process. The new water being added daily could be stressing the nitrifying bacteria that is attempting to become established in your gravel and filter. I'm assuming that your filter is working properly, that it is of proper size for your 29-gallon tank and that it offers chemical, mechanical, and most importantly, biological filtration. It still amazes me that there are some inexpensive filters out on the market that offer very little or no biological filtration. Also, you might measure your tap water just to make sure that there isn't a high level of nitrate present. To assist in the cycling process and in establishing the nitrifying bacteria, you might look into purchasing a bacteria starter and enhancing product.

When you feed your fishes, closely observe them for overall health and feeding behavior. You should be able to easily determine if all your fishes are exhibiting healthy and active feeding behavior. If a specific fish is not getting enough food, it won't take long for the fish's abdomen to become concave, for the fish to show signs of stress and/or disease or to become lethargic and less active.

You stated in your letter that the light is used later in the afternoon and throughout the night. Why is the light left on during the night? Your diurnal fishes should be provided a distinct day and night period. This is easily created by integrating an inexpensive timer with your light to provide consistency with respect to a day and night schedule. By establishing a diurnal schedule, it will reduce stress on the part of your fishes, too.