

Fritz TurboStart

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Well folks, I have learned a bunch of new stuff. And I have approached it cautiously, and I have interviewed most of the experts on the subject. (And I am not talking about Internet pundits who don't have fish of their own.) I replicated my bench tests in this area two times and then took it into the field for some clinical experience and I am glad I did, because most of the kinks got worked out this way.

What I have to say "distills" down to this: What if you could start up a brand new system, pond, quarantine or facility and have NO BREAK IN period?

Well, you can.

There is a beneficial-bacterial adjuvant which works over and over, in almost any system. But there are "gotchas" you should be aware of.

I tested several promising new "nitrifying" products over the last year, and the situation that kept recurring was that I had to accumulate a high ammonia and nitrite level before the products I was testing could live and work. This means the fish have to experience the stress of poor water quality before the products could benefit them. Also, many of the products I tested would give variable results, and some took over three weeks to eliminate nitrogen accumulations. Not acceptable. Fish die in that time.

You have to admit that cutting the cycle-time in half is still pretty good, but I was really waiting for something that would give ZERO nitrogen accumulation from start to end. NO 'BREAK IN' spikes.

For those too busy to read the whole thing: **"Fritz Industries, TurboStart. It works."**

But you *CAN* screw it up, I learned from experience. So if you have the time, please read my whole article and make sure you don't "drop the ball" in any of a few areas where common mistakes occur.

Okay, I wanted to "discover" something people could buy and get replicable results. Everyone with a brain who is capable of following some simple directions can make this one work. It bears mention that I did not use the product exactly the way they said to on the bottle. I will explain the protocol in detail later if you want to spend the time.

The product is manufactured by Fritz Industries and is called "Fritz TurboStart". There's an important difference between their regular FritZyme and the Fritz TurboStart.

The Fritz TurboStart is a highly concentrated (fifteen times) concentration of literally billions of bacteria. This concentrate is, in my opinion, the "fast track" to completion of the cycle. The problem is that in it's concentrated form, Fritz couldn't "waste space" on nutrients, and preservatives which would have

served to extend the shelf life. So TurboStart is sold on a "drop-ship" basis by retailers directly from the manufacturer. I will discuss Fritz' revolutionary distributor program in a while. Who knows, you might just get rich.

So TurboStart is a cold, concentrated solution of live nitrifying bacteria shipped overnight from the manufacturer. As you can imagine, the overnight-chilled-shipping contributes considerably to the expense of the product.

I've defined a lot of the basic terms and ideas in the Glossary section at the end of this document. Please review these ideas and definitions for an overview of terms like "Cycle" and "Break in" period.

Here's the general idea:

You would need "introduced-nitrifiers" if you have any of the following circumstances and you need "instant nitrification":

1. New system just installed, no time to cycle because the fish are on their way.
2. Or, the fish are on their way and they need a cycled quarantine
3. You've set up a hospital tank and it needs nitrifiers to maintain nitrogen reduction.
4. You "got stupid" with some Formalin and your filter's beneficial-bacterial colony is "whacked".
5. You completely dismantled your filter, scrubbed the pond with chlorinated water and you have no bio-film (see glossary).

So the basic idea is: You can now just detect or anticipate a problem with nitrogen reduction and simply buy the bacteria to reduce the problem. Just pour it in, right? NOPE.

Remember, you're buying a living colony of nitrifying bacteria and they have needs. They have feelings. They want to be loved.

YOU CAN'T JUST POUR IT IN:

Mistake #1:

You can't leave your Ultraviolet Sterilizer (U.V.) on when you're using TurboStart because the U.V. will kill 100% of the bacteria instantly as it passes through the U.V. chamber. Don't make the mistake of spending all that money on TurboStart and then leaving your U.V. on because it's more than an "Oops" - it's OVER for those bacteria. Time to buy more.

Mistake #2:

Salting heavily during application is not a good idea. We tested TurboStart in salted systems but they were only salted to 0.3% (one pound per hundred gallons) and it's well known that the specific nitrifier (Nitrobacter) is sort of sensitive to salt. I'd recommend that you run little or no salt during the TurboStart applications. Salt does not kill your bio unless it's introduced or dissolved directly in your skimmer basket. Direct dissolution of salt into the filter will skin your bio-media "sugar-white". No more bio.

YOU SHOULD KNOW: Low level salting, at three pounds of salt per one hundred gallons is not detrimental to bio-filtration but it DOES "impede" or slow down the more rapid seeding of Nitrobacteria.

Mistake #3:

You have to support the carbonate alkalinity and allow physiological phosphate levels for the bacteria. [See conditions]. The Total Alkalinity of the pond or facility should be over eighty [80] ppm. If your Total Alkalinity is lower than seventy, you will probably be disappointed with any introduced nitrifier. When you boost your new pond's alkalinity, it doesn't hurt to use a buffer with phosphates (older ponds generally have enough phosphates). Most of us relate phosphates to Algae growth, but indeed, nitrifying bacteria *also* need some phosphate to survive.

YOU SHOULD KNOW: If your Total Alkalinity is lower than seventy, you will probably be disappointed with any introduced nitrifier.

It's important to note that MOST hobbyists have plenty of phosphates in their systems for bacteria to flourish. You know, phosphates primarily arise in the systems from the food we give the fish. It's a natural by-product of digestion in aquaculture.

YOU SHOULD KNOW: Feed your fish, and unless you've got something wierd going on, you've got phosphates...

Mistake #4:

If your filter is rated for five hundred gallons and the pond is five *thousand* gallons, absolutely no introduced-nitrifier will work. There's really not enough area for the bacteria to live. Not even in the biofilm. It's not rare for a person with an under-sized filter to check their water and detect an accumulation of nitrogen. (Ammonia, Nitrite or Nitrate). So they buy something like TurboStart to reduce the nitrogen, and it just doesn't work. TurboStart is a bacterial culture. It does not chemically reduce or remove Ammonia or Nitrite the way sodium-methane-sulfonate does. The introduced nitrifiers will enter the system and quickly colonize available surfaces and begin to reduce the nitrogen. If those surfaces do *not* exist, there will be disappointment. It's important for the hobbyist to conserve their resources and take the time to establish that their filtration system is proportionate to their feeding practices, fish loading and water volume. THEN the investment in TurboStart is wise.

Mistake #5:

If you nuked your filter with a medication, and then immediately add TurboStart, you will be disappointed. (I did this). The medication may remain and interfere with colonization. You'd be smarter to execute a massive water change (90%) with dechlorinator and then apply the TurboStart a half-day later, when the system is stable.

Mistake #6:

Remember, it's a bacteria culture, not a chemical. So applying it to a pond which has been recently filled with "chlorinated" water is basically sending your money to it's useless death. Always dechlorinate, even when fish aren't there. Your beneficial bacteria will love you for it.

Mistake #7:

If you apply TurboStart to water which is unfit for Koi inhabitation, you're going to fail. In fact, I daresay TurboStart bacteria could benefit in their application by "heightened" aeration, and extraordinary circulation. Water with high turbidity and which 'stinks', or is depleted in oxygen will simply kill your introduced nitrifiers. These bacteria are just as sensitive as the Koi are to water temperature, dissolved

oxygen and overall cleanliness. The notable exception is that these bacteria relish Ammonia or Nitrite accumulations whereas your fish don't.

Mistake #8:

Bead filters specific: People start up a bead filter, pour in the TurboStart and run the filter on "high flow". They backwash every couple days trying to control the naturally occurring haze which is common in virgin water as it "breaks in". This early haze has nothing to do with the TurboStart. Running the filter on "high" does not permit sufficient residence time for the TurboStart to grab those beads. If you can stand it, run the pump on low and let the bacteria enter the filter and stay as long as possible with gentle flows. BY ALL MEANS do not backwash a new bead filter during the first three weeks (unless specifically and verbally directed to do so by the manufacturer). PERIOD. When people see some deterioration in water quality with a bead filter, they have this tendency to backwash over and over again, and they "strip the beads" (see glossary).

So, Dr. Johnson, how exactly did you test the TurboStart?

I had some systems in which I was testing another nitrifying product and an Ammonia binder. I applied TurboStart and it did nothing. But then again, you'd have had to see that particular test bench. The water was tan with filth and had been treated with these chemicals several times. But the way they raved about the TurboStart at Fritz, it should have worked, right? NOPE.

I spoke with the folks over at Fritz again, and I checked some of TurboStart's references, and the people I talked to echoed the successes I had heard about from **Carl Forss** and **Tom Hatfield**. So I agreed to test again in virgin systems.

I set up three tanks and started with roughly fifty grams of fish in each. I ran a Millennium filter on two systems, and a sponge filter in the other. I applied the Fritz TurboStart more frequently than they indicated, from Day One. I also fed from Day One. We avoided the "Cycle" with it's Ammonia and Nitrite spikes, completely. The Millennium filters did a better job colonizing early probably because the pads were impregnated with carbon, but the Sponge filter kept the water clearer.

I sent samples of TurboStart home with three local people screened for appropriate water quality problems and they used the compound in their systems. In most instances, the cases being treated in the field were suffering chronic Nitrite accumulations due to lagging filter seeding or performance. In all cases, the nitrites were reduced to zero levels probably due to colonization of the bio film because their filters should have been adequate to "carry" in the first place.

So, I was convinced.

I had some questions though. I wanted to know for sure that the TurboStart did not contain any chemicals to bind Ammonia or defeat the Ammonia test. So I talked to Kevin Senkevech at Fritz Industries and this is where I learned all the cool junk about the introduced nitrifiers in TurboStart.

I was promised that the TurboStart does not have Ammonia binders. But even if the TurboStart had chemicals to bind the Ammonia, how would that explain the vanishing Nitrite levels as well? So I was convinced.

I think the only problem with TurboStart is that it has to be "babysat" and coddled a little in order for it to work as promised. People have to be smart enough to work around things like UV's, low carbonate alkalinity and other gas and chemical hazards which could spell death for the introduced nitrifiers.

Is your pond ready for TurboStart?

1. Nitrogen accumulations are detected or inevitably expected.
2. Minimal or no salting regimen underway.
3. Alkalinity supported by phosphate rich buffer like SeaChem Neutral Regulator, Calcoforce or Buffitup.
4. Filter is proportional to load and feeding rate and
5. correctly plumbed to suitable pump.
6. Water is free of any residual medications, toxins, chemicals or other contamination.
7. Water is dechlorinated
8. Water is fresh, relatively clean and very well aerated, in the mid-seventies Deg.F.
9. UltraViolet sterilizer is OFF
10. Bead filter un-backwashed during colonization and running on low.

So what's so novel about Fritz's distribution of product?

Fritz' Distribution

Currently, most product bought by hobbyists are sold by the manufacturer to a distributor, and the distributor marks it up to the retailer who marks it up to the hobbyists.

With Fritz industries, the retailer buys direct from the manufacturer and there's no distributor. Costs to the retailer are nearly half on the same water test kit from Fritz than they'd pay for a test kit from anyone else. This means that to offer the same product, margins can be almost doubled. The hobbyist wins because they get a comparable or superior product cheaper; but the retailer has a better margin.

If you want to deal TurboStart, all you have to do is become a Fritz Retailer. You can have bottles of TurboStart in your store and the information that goes with it. Then the customer comes to you and requests the TurboStart for delivery tomorrow. You contact your Fritz Rep and they expedite the product to your customer. You don't have to stock it. Nothing to lay out financially, customer is educated and their problems are solved, and the retailer makes a sale without carrying ANY overhead inventory. I am sure many dealers wish all products could be sold that way.

Finally, then. "How would you apply TurboStart to YOUR new system, Dr. Johnson?"

I'd cheat. I'd cheat like heck and take every conceivable advantage regardless of the science, because it's best for the fish. Here're my formal recommendations. Failure to comply with these recommendations may result in variable results and I pity you.

1. Fill pond, tank or facility with water.
2. Dechlorinate, and then buffer the water with phosphate based pH regulator.
3. Install filter and begin filtration
4. Disable UV clarifier
5. Optionally: Find some organic "fuel" for the nitrifiers. The best is the "squeezeins" from an established filter. Brown backwash fluid from a bead filter, sponge-filter squeezeins, matt-pad squeezeins, the crap from the bottom of a vortex settling chamber, whatever. I'd collect about all I could and I would pollute the new system with the brown incubus. This will also supply nitrifiers from the established filter but could also introduce pathogens as well. Consider that. **DO NOT DO THIS IN INHABITED SYSTEMS OR THE FISH WILL DIE.**
6. Let the filter suck up the brown "squeezeins". This normally takes about six to twelve hours.
7. Apply Stress Coat or FritzGuard and let the filter suck that up. (This normally takes two hours)
8. Within a few hours of performing #7 I would apply my first dose of Fritz TurboStart.
9. Apply Fritz TurboStart daily, even if you half the recommended dose per application, frequency surpasses the amount when it comes to effective colonization.
10. Introduce fish whenever the water looks good and is temperature equillibrated to the incoming fish.
11. Continue to apply Turbostart daily, along with regular feedings, and monitor Alkalinity, Ammonia, Nitrite and pH.
12. In warmer water, over eighty Deg. F, "floom" the pond.

"What if I got hit in the head and rinsed a gallon of activated charcoal in the pond before adding the fish? Would the filter suck up the black carbon-cloud and impregnate the media, stimulating faster colonization?"

YES. You would further ensure the TurboStart "takes" in your system. But if you did that with fish in the tank, the black carbon cloud would kill most of the fish before the filter had a chance to remove it. I did that once when I was a kid too lazy to rinse my carbon before exposing fish to it. Doc Johnson.

"This all sounds like a major pain in the a*s!"

It really is. But to anyone who has been on the roller coaster ride of Ammonia and Nitrite spikes, with the resultant fish illnesses that ride in it's stressful wake, it's just a walk in the park.

The vast majority of people with nitrogen problems are going to buy TurboStart, get it shipped to 'em tomorrow, and find it works just great. A few people will ignore one of the "gotchas" and rediscover a way to kill their introduced-nitrifiers. Still a few others will find new and exciting ways to kill their nitrifiers, and in *this* odd case, the manufacturer has agreed to some product replacement in cases where the customer is not plainly at fault. You should clear this with the vendor of the product if you have any

doubt and buy from someone who will back you up if it fails. Remember, it's expensive, so don't screw it up!

Nifty junk I learned: Difference between heterotrophs and nitrifiers: Heterotrophs are usually mixtures of different strains of Bacillus. Bacillus bacteria can be strained to do a lot of different things, but are used mostly in the recovery of wastewater. Heterotrophs such as Bacillus subtilis can consume prodigious amounts of nitrogen. However, they may use a lot of nitrogen but they don't always or replicably use Ammonia and Nitrite. Usually their proficiency is at reduction of protein and other sludges which would contaminate or clog a bio- filtration system. Occasionally you can find a heterotroph which will "chip away" at the Ammonia and nitrite nitrogen forms.

Conditions necessary for survival of introduced nitrifiers I did not really understand or realize that nitrifiers were as "picky" as they are. I did not know that they REQUIRE a small amount of phosphate, and a hearty amount of carbonate alkalinity to do their job.

KNOW THIS:

* A person using a "phosphate-remover" or who underfeeds their fish might not have enough phosphate in the ecosystem. Introduction of a nitrifier into such an environment could cause product failure. To avoid this, the use of a "Neutral Regulator" or "Buffer" which contains phosphates (phosphoric acid as a buffer) is recommended for best results with introduced nitrifiers.

* Carbonate levels under 70 PPM will disappoint as well. The nitrifiers depend upon the carbonates for optimum nitrogen reduction because the nitrifiers are robust Hydrogen-ion generators. Without carbonates, this manufacture of hydrogen- ions will compromise water quality, which affects the fish as adversely as it does the beneficial bacteria. The nitrifiers also depend on some of the minerals in harder water to form essential parts of their cellular makeup. Well buffered water will increase the success rate with any nitrifier you're using.

Behavior of nitrifiers and some of their preferences

Nitrifiers live on surfaces.

Science once asserted that these bacteria were really FIXED on the surfaces and could not be dislodged without mechanical abrasion from surfaces. Science also held that these bacteria could not live "loose" in the water, and could not be bottled. The fact is that the bacteria live in a relatively soft stroma of material that attaches them to surfaces. Extreme water flows can simply rinse these bacteria away if these flows are sustained. I always thought that the "coating" which held the bacteria onto their media-surfaces was more like coral or something. Indeed, it's much more like rubber cement.

Did you know that nitrifiers will preferentially colonize media impregnated with carbon?

I did not know this either but it is well known over at Aquarium Pharmaceuticals. It's the whole idea behind their BioStars. Carbon is REALLY attractive to nitrifying bacteria. If they made bead filters with a carbonized bead, they would really be "onto something".

Did you know that it DOES matter to the nitrifying bacteria; how smooth a surface is?

Of course, introduced nitrifiers will grow absolutely anywhere they can get a hold, including glass and slick white PVC plumbing. However, porous surfaces and rough surfaces will be superior to, and more quickly colonized than, the smooth surfaces. This comes into play in bead filters. Beads which are smooth polyethylene are inevitably destined to be colonized. However, the rate at which the colonies

would form and how successfully they would coat the bead would increase directly with the porosity of the bead. If manufacturer's sandblasted or tumbled the beads before employment in their filters, they'd really be "onto something".

In this vein, research has shown that TurboStart works optimally when the pond or facility is pre-treated with an aloe or polyionic coating solution. Examples of these solutions include FritzGuard (c) FI and Stress Coat (c) API. These two solutions only differ in their name. A legal conflict and separation has left the formulations identical and given the consumer the choice to select based on price. Buy whichever one is cheaper in your locality. The general idea is that the surfaces and bio-media (beads) in the system and filtration unit will become coated. Following shortly afterwards with the TurboStart dosage gives the bacteria an ideally prepared surface on which to settle and begin to colonize.

Replication rates of the nitrifiers:

Nitrifiers replicate daily. That wouldn't sound very odd to most people, but regular bacteria can replicate many times per hour. So we realize that nitrifiers are slow to replicate. Slow to colonize. This is why pond people with large volumes of water need the concentrated Fritz TurboStart and not the watered down FritZyme.

Glossary

Nitrogen accumulation: Nitrogen can accumulate in several forms in water; in the form of Ammonia and Nitrite and Nitrate and these compounds are quickly or eventually hazardous to fish health. Naturally occurring bacteria reduce these compounds.

Strip the beads: Excessive backwashing can strip the mucopolysaccharide coating from the beads, removing the resident bacteria in large numbers. Obviously the beads don't become "sterile" but the coating of bacteria is reduced and this can permit nitrogen accumulations.

Bio Film: Beneficial bacteria can (and do) grow on any submerged surface, not just inside your filter. The thin layer of beneficial bacteria which grows on the sides and bottom of the pond is called the "biofilm" and it's importance to proper and complete reduction of nitrogen should not be underestimated. This "biofilm" often compliments and sometimes compensates your bio filter.

The Cycle: The natural process by which helpful and necessary bacteria grow in both your filter and in the "biofilm" of your pond's submerged surfaces. These bacteria reduce nitrogen, thereby removing these compounds and preventing them from harming the fish. A system which completes the Cycle and in which the population and it's feeding rate are balanced by the function of the beneficial bacteria; achieves what is called "Equilibrium".

Break In: The period of time for the Cycle to complete, and for Equilibrium to be achieved.

Spikes: Intervals of peak nitrogen accumulation are tabulated on a graph and appear as "spikes" as the Ammonia and Nitrite levels reach their peaks.