AQUAINTECH TOOLS FOR BIOREMEDIATION

The widely agreed upon definition of a probiotic is a living microbial preparation that when fed to an animal colonizes the animal's intestinal tract and positively impact the animal's health. This term is widely misused in aquaculture and an analysis of the literature (gray and peer reviewed) suggests that the term may be largely inaccurate. What we call probiotics are in reality, simply **a microbial tool for bioremediation**.

These products manipulate the microbial ecology in the pond for a short period of time. Any action in the gut (at least in farmed shrimp) is likely irrelevant to the effect.

Many commercially available products contain low levels of bacteria, all to often dead, if present at all, that cannot possibly do what the vendors claim. In some instances they may include substances that appear to cause an effect (such as antibiotics) but are not on the label. While it is possible to sell bacterial preparations that do not consist of bacterial spores from gram positive bacteria, these products are often very expensive, some may require refrigeration to ensure even a modest shelf life, others may have extremely short shelf lives or are stabilized liquids that involve selling products that are largely water.

***Bacillus* species can be cultured inexpensively and are the best stable candidates for creating the best products.** This is because they produce spores in response to a changing environments. These spores tolerate high temperatures and can remain viable for millennia. *Lactobacillus* strains do not form spores and will die rapidly under environmental conditions that spores tolerate well. Products that contain them are best kept refrigerated prior to use, otherwise assurance of viability is problematic.

Powdered products that are not Bacillus spore based that are added to pond water often have low levels of viable cells. Adding high levels of bacteria is costly and has little proven efficacy.

When vendors make claims based on a standardized addition of product (i.e. add one kg per ha, 5 liters, etc.) caveat emptor. Each body of water is different and effective programs must take this into account. These are not chemicals and the use of recipe type approaches to the application of living bacteria/spores to production systems will not work.

The proper use of products require range finding tests to determine optimal dosages and timing of application. As the cycle progresses higher levels must be added and usually at higher frequencies. You should expect to use more and more often as the biomass in your production ponds increases.

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AQUAINTECH TOOLS FOR BIOREMEDIATION

Our tablets (range in size from < 1 g to >50 g) are designed for ease of use and we have excellent data to support its use in farms and hatcheries.

PRO4000X

A tableted mixture of powerful strains selected for their ability to degrade organic material. Each tablet contains approximately 4 billion CFU of spores per gram total of *Bacillus subtilis* and *B. licheniformis* spores. These bacteria degrade organic matter, ammonia, and compete against other bacterial species. Tablets can be added to ponds, lakes, golf course lakes, koi ponds, shrimp ponds, fish ponds, and shrimp and fish hatchery tanks where they dissolve and the bacteria germinate and grow.

AquaPro-EZ

This powdered material contains at least 4 billion CFU per gram of *B. subtilis* and *B. licheniformis*, a range of nutrients, and is packaged in biodegradable bags. These are thrown into the water where, similarly to the tablets, they sink to the pond bottom and dissolve. Nutrients are then immediately available for bacterial growth. Best for use in low density, minimally aerated environments. The bag is a convenient delivery tool and many clients like the convenience of having a prepackaged amount of product.

AquaPro-F

This product is for incorporation into or onto feed (top dressing) at 1 to 5 kgs per MT. It is only made fresh. Although the process of milling in the feed does result in high heat and shear for a short period of time, spores are heat resistant and there will still be very high spore counts in the final feed product, approximately 4 million CFU per gram of feed in-situ. It contains 5 species of bacteria, added enzymes to aid in feed digestion and a potent prebiotic (MOS) to condition the digestive tract. It is very similar in appearance to AquaPro-B.

AquaPro-B

This powder is the same as EZ except sold in bulk, not bags. The powder is soaked in warm clean water prior to use and added to the ponds after a few hours.

We custom formulate products and private label.

We can add many different organisms, enzymes, prebiotics, immune stimulants, etc. to custom blends. These can be powdered, tableted, liquid, etc. MOQ apply. Please inquire.

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Our client base is growing!! We have clients in many different countries including Ecuador, Venezuela, Mexico, India, Indonesia, Singapore, Vietnam, Egypt, Malaysia, Suriname, the United States, Taiwan, China and more.

- ✓ Less accumulated sludge
- ✓ Cleaner water
- ✓ Less water exchange = less cost
- ✓ Healthier pond bottoms
- ✓ Lower hydrogen sulfide levels
- ✓ Lower ammonia levels
- ✓ Less blue green algae (by competitive exclusion)
- ✓ Higher yields
- ✓ Higher survivals
- ✓ No antibiotic usage
- ✓ Lower vibrio loads (by competitive exclusion)
- ✓ Cleaner animals at harvest with higher value at partial harvests

Our clients report many different benefits.

Every pond is different. Application rates should vary depending on pond type, size, stocking density, water exchange rates, pond location, amount of biomass in the ponds, amount of protein in the feed, the presence of stress related disease problems, etc. We work closely with distributors and individual clients to optimize usage rates. **Please ask.**

Our products work. They do what we say they do. Our many satisfied clients include those who use the tools of science for optimal results and have the hard data to support their observations.

It is important to understand that these are tools. **As with any tool they have to be used in the right way**. This can involve some trial and error.

It is always better to be **PROACTIVE** rather than **REACTIVE** when it comes to managing aquatic animal health. When farmers report that our products do not work, it is because they do not understand how to properly use them. Used correctly, they are valuable **tools** for improving profitability and ensuring sustainable productivity. They cannot solve or fix problems that are inherent in the production paradigm. They will not cure diseases or fix water quality problems such as low DO levels.

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