MiCroBial TECHNOLOGIES

Fact Sheet

MiCroBial Feed Management Program

Feed Management

Feed represents around 50 – 80% production cost in aquaculture. Proper nutrition is one of the critical factors in aquaculture. Successful aquaculture depends on a nutritionally balanced diet and low cost of production. The nutritional quality and cost of the feed depending on the price and quality of the feed ingredients and additives which is used for feed formulation. Feed ingredients are a mixture of both organic and inorganic components. These components are varied based on the raw material and their extraction process. Feed additives are added during feed preparation to improve the quality of the feed and health performance, feeding efficiency of the fishes. Most of the feed additives are non – nutritious and include antioxidants, immuno stimulants, probiotics, antibiotics are added in the culture system to improve the growth as well as water quality. These components in aquaculture feed also increase the cost of production. To overcome escalating costs, feed companies have turned to the application of functional feed additives. These functional feed additives have become an alternative for antibiotics and chemotherapeutics. The functional feed additives improve growth, immune response; induce the physiological functions and health performance of the fishes over the normal feed additives. Functional feed additives includes as given below.

- Probiotics
- Prebiotics
- Enzymes
- Proteins
- Vitamins and Minerals
- Yeast Products

Probiotics

Fish intestinal microbial balance can be improved by the use of probiotics. Probiotics are live microbes supplemented to the fish gut through feeds. It has an antimicrobial effect thru editing the intestinal microbial stability, secreting antibacterial substances (bacteriocins and organic acids) competing with pathogens to prevent their adhesion to the intestine, competing for nutrients vital for pathogen survival and producing an antitoxin effect. Probiotics are also capable of modulating the immune system, regulating the allergic response of the body, and lowering the proliferation of cancer in mammals. So it is commonly described as friendly bacteria or healthy bacteria. It also improves the water quality of the aquaculture systems.

Following are the probiotics used in aquaculture as a feed supplement,

- Group of Lactobacillus spp
- Group of Bacillus spp
- Group of Saccharomyces cerevisiae

Prebiotics

Prebiotics are non-digestible feed ingredients that beneficially affect the host by selectively stimulating the growth or activity of one or a limited number of bacterial species already resident in the gut and thus attempt to improve host health. Commonly used prebiotics in aquaculture is oligofructose, oligosaccharide, fructooligosaccharide, mannan oligosaccharide, galactooligosaccharide, b-glucan. The following criteria should be a must for prebiotics, which is used in feed,

- Resistance to the upper gut tract of the fishes.
- It should be easily fermentable by intestinal microbiota.
- It should be beneficial to host health.
- It should selectively stimulate the probiotics

Enzymes

The negative effect of anti-nutritional factors, affect the digestion of dietary components and growth performance of the fishes. These problems can be overcome by exogenous enzymes. Commonly used enzymes in aquaculture feeds are phytase, carbohydrase, protease, lipase, alpha - amylase, papain, pepsin. Eighty percent of the phosphorus in the plant seeds is present in the form of phytate. For the fishes, the phytate phosphorus digestibility and bioavailability is very low. Hence, phytase in fish feed increases the phytate phosphorus digestion and reduces phosphorus excretion and it also increases the protein and phosphorus utilization. The digestible efficiency of the Non-starch polysaccharides is increased by the addition of non-starch polysaccharides degrading enzymes in the feeds. Following are the effect of different enzymes on the feed and aquatic animal growth,

- It improves growth, feed conversion ratio, protein efficiency,
- It improves digestibility of aquatic animals
- It converts complex feed into simple feed which can be digested easily by aquatic animals

Yeast

Yeast contains a high amount of enzymes, fatty acids, amino acids, vitamin B – complex and number of unknown growth factors. Yeasts are used in both terrestrial and aquatic animal nutrition. Only a few species are used in aquaculture, among which Saccharomyces cerevisiae is the most common. The Bakers yeast cell wall contains a high amount of mannan oligosaccharides and brewer's yeast contains more amounts of trace minerals such as selenium and chromium. It has been proved that yeasts can enhance growth, survival, maturation; improve the immune and antioxidant systems in finfish and crustaceans. β-glucan, mannoproteins, chitin (as a minor component), and nucleic acids are the main components for yeasts immune-stimulatory properties. Mannan - Oligosaccharide removes the bacteria from the gut, enhances growth performance, improves feeding efficiency, and also increases guts absorption efficiency..
Effect of yeast in different fish feeds are given below.

- It increases growth performance and feeding efficiency in aquatic animals
- It improves disease and bacterial resistance against infections in aquatic animals.
- It enhances cellular innate immune response against infective bacteria.
- It secretes different enzymes applicable for digestion of different substances in feed.

Vitamins and Minerals

Unique combination of essential Minerals, Vitamins, required for proper growth of aquatic animals. During the period of stress and disease, the fluid and soft tissues are affected. This leads to the drain of electrolytes from the body creating electrolyte imbalance in the body. Deficiency of minerals leads to abnormal shell and muscle formation. minerals imbalance in the soil and water leads to poor growth and survival of shrimp/fish.
combination of different minerals that are mixed in certain compositions which are highly useful in Aquaculture. Mixture of vitamins and minerals provides all necessary strength that is required for the pond. Minerals play an important role in regular dietary requirements of Fish and Prawns and are essential for their growth. Plankton Balance is maintained. Essential minerals are destroyed during the digestion process due to interactions with other components of feed in such situations these minerals will replace the requirements.
Vitamins and minerals effects are given below,

- Prevents mortality.
- Resistance against diseases.
- Help moulting and shell formation.
- Effective against gut problems.
- Provides shell firmness and weight gain.
- Help shrimp growth in fresh water.
- Reduces stress from salinity changes.
- Better survival rate.

MiCroBial Technologies

The core MiCroBial Technologies provides a natural biocatalyst made via a novel fermentative process that has been continually refined by microbiologist in India. MiCroBial Technologies probiotics consists of a select consortium of bacteria, enzymes, nutrients and co-factors that peforms different functions of inhibiting growth of pathogens. These microbes produce different types of enzymes as amylase, Protease, Lipase, Cellulase etc. MiCroBial Technologies probiotics works in aerobic and anaerobic conditions as it contents aerobic and facultative anaerobic microbes.

Benefits of MiCroBial Technologies

- Promote fish, shrimp prawn growth rate and production
- Inhibit the growth of pathogenic bacteria by competing with them for food and reduce the chances of infection
- Increase Feed Conversion Rate (FCR) aquatic animal.
- Increase Body Weight Gain (BWG) in aquatic animal.
- In-take of the feed will go up
- Restores the resistance
- Restores the Growth
- Act as anti-microbial agent
- Prevents infectious gastrointestinal disease
- Improves the intestinal microbial balance
- Release antimicrobial compounds and modulate immune activity.

Composition

MiCroBial Technologies probiotics is a consortium of probiotics belongs to Bacillus, Lactobacillus. Yeast, Herbal extract, prebiotics vitamins, minerals and enzymes etc

Application of MiCroBial Technologies Probiotics

Take required quantity of MiCroBial Probiotics and mix with protein gel. This solution mix with feed and dry it for 10 min and spread over the feeding area.

Dosage - 4 gms per kg feed /twice a day

Storage:

Product is delivered in sealed, moisture proof packaging. Product should be stored in a cool dry location, out of the sun and protected from insects. Once opened, MiCroBial™ Technologies must be kept dry in an airtight container to prevent activation. Do not Freeze

Product shelf life:

1 year (minimum) under standard warehousing/office conditions

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For dosing concentration and application, please contact to our technical team.

Please refer to the MiCroBial Technologies website for the appropriate MSDS, www.microbialtech.com

MiCroBial TECHNOLOGIES

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