

ไบโอดี

BIOTA

Probiotic  
*Bacillus spp.*

- 🌱 A ready-to-use formula, the fermentation is not required.
- 🌱 Enhance efficiency of feed utilization.
- 🌱 No observed adverse effect when used as advice. BIOTA is safe for users and animals.
- 🌱 BIOTA is an organic product; it is free from the chemical use or artificial coloring, and Environmental friendly.

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# BIOTA

BIOTA contains 3 different species of probiotic Bacillus

Each kilogram of Biota contains

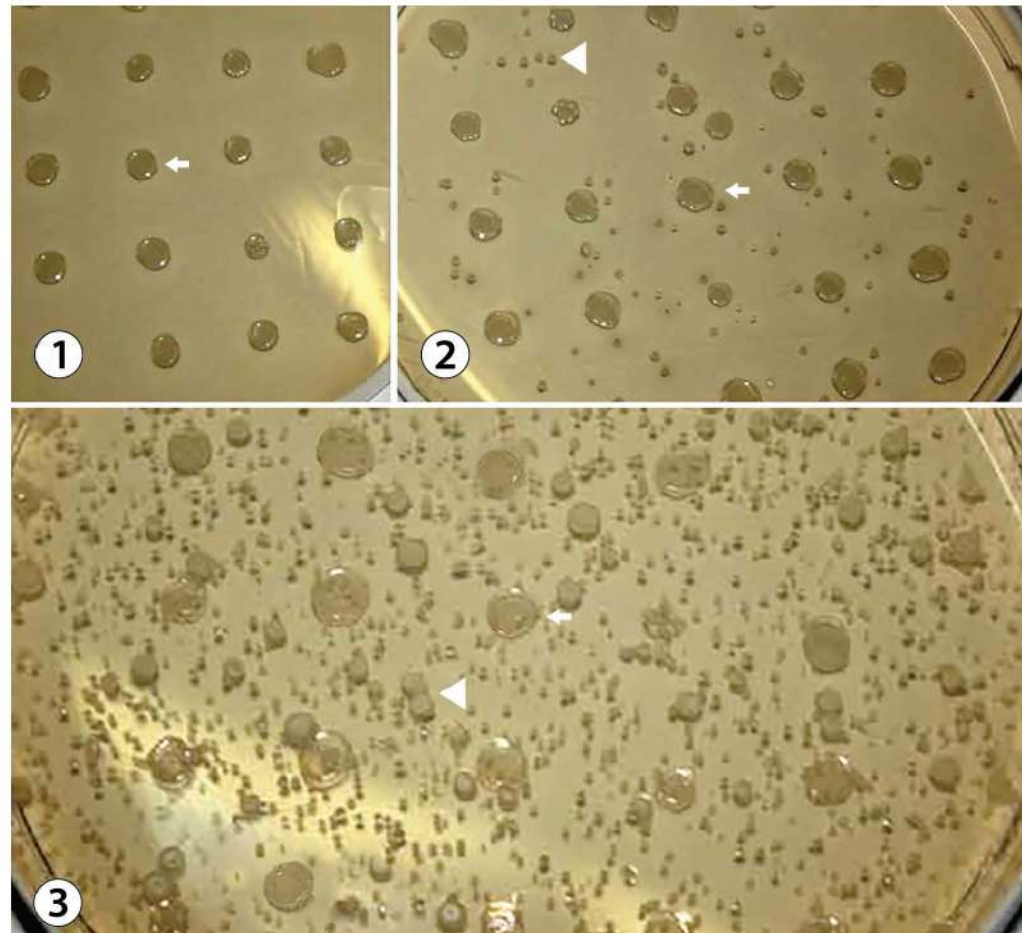
- 1 x 10<sup>10</sup> CFU Bacillus subtilis
- 1 x 10<sup>10</sup> CFU Bacillus licheniformis
- 1 x 10<sup>10</sup> CFU Bacillus megaterium

Probiotic bacteria improve feed utilization via mechanisms of the efficient digestion and nutrient absorption. For wastewater treatment, probiotic bacteria assist the decomposition of organic matter in soil and water. The probiotic bacteria competitively inhibit growth of pathogens.

BIOTA is biotechnologically invented product. With the use of natural carrier, BIOTA provides a non-synthetic, safe and environmentally friendly application for livestock and aquatic animals.



## Examination of the inhibitory action of probiotic Bacillus against streptococcal pathogen



### In vitro inhibitory potency of probiotic Bacillus against Streptococcus spp. isolated from tilapia

Fig.1 Spots of Streptococcus (arrow) growth were visible on Mueller Hinton Agar after 24 h incubation at 30°C.

Fig.2 The addition of Bacillus (arrow head) to Mueller Hinton Agar inhibited the growth of Streptococcus, barely visible growth of Streptococcus was observed with an increasing density of Bacillus (Fig 3). The growth inhibition ability of probiotic against target pathogens was clearly obtained when the probiotic density was higher than that of streptococcal bacteria and the degree of inhibition increases with the density of the antagonist.

Source: In vitro Suppression against Streptococcal Bacteria and Health Promoting Effects of Probiotic Bacillus polyfermenticus in Tilapia (*Oreochromis niloticus*).  
Thai J Vet Med. 2015. 45(1) : 121-129.

## In vitro Suppression against Streptococcal Bacteria and Health Promoting Effects of Probiotic Bacillus in Tilapia (*Oreochromis niloticus*)

In vitro antibacterial activity of probiotic Bacillus against tilapia streptococcal pathogen, evaluated using the agar dilution method and co-incubation method, confirmed the inhibitory effect of Bacillus on the growth of Streptococcus and the inhibition was more evident in the system with high density of Bacillus. Subsequently, feeding administration of probiotic Bacillus was employed in tilapia broodstocks (12 months old) and fry (37.33 ± 1.37 mg body weight) to examine the effect of probiotic on health performance. Significantly higher amount of fertilized eggs was recorded in the tilapia broodstocks fed probiotic supplemented diet for 5 months as compared with the control groups ( $p < 0.05$ ) (Table 1), however no significant differences were found in the survival of broodstocks between the treatment and control groups. The tilapia fry fed on probiotic Bacillus diet for 28 days also displayed significantly improved feed conversion ratio, average daily weight gain and survival rate (Table 2). This study demonstrated the in vitro anti-streptococcal potency of probiotic Bacillus and its potential to be a dietary supplement for tilapia health promotion

**Table 1** Production of fertilized eggs and survival rate of broodstocks after 5 months of dietary supplementation

Experimental group	Weight of fertilized eggs (g/month/150 females)	Survival rate (%)
Treatment	569.33 ± 17.93 <sup>a</sup>	98.83 ± 0.29
Control	501.67 ± 24.69 <sup>b</sup>	98.33 ± 0.58

Different superscript letters are significantly different ( $p < 0.05$ ).

**Table 2** Body weight, ADG, FCR and survival rate of tilapia fry after 28 days of BP dietary supplementation

Experimental group	Average BW (mg/fish)		ADG (mg/day/ fish)	FCR	Survival rate (%)
	D0	D28			
Treatment	37.03 ± 2.00	175.49 ± 3.25	4.94 ± 0.09 <sup>a</sup>	1.37 ± 0.03 <sup>a</sup>	93.27 ± 1.99 <sup>a</sup>
Control	37.63 ± 0.64	163.67 ± 6.03	4.50 ± 0.20 <sup>b</sup>	1.51 ± 0.07 <sup>b</sup>	86.43 ± 2.10 <sup>b</sup>

Different superscript letters in columns are significantly different ( $p < 0.05$ ).

**Health**  
promoting effect

**BIOTA**  
improves water quality  
with complete decomposition of  
organic waste, thus controlling  
the noxious odors

**Competitive**  
exclusion against pathogenic  
bacteria

**Enhance**  
the amount of beneficial  
microbial flora

## Application of **BIOTA** in aquaculture:

BIOTA maintains water quality, decomposes organic waste and supports the animal gut microflora, thus improving health performance and production efficiency

### **Benefit of probiotic feeding supplementation**

1. Probiotic feeding supplementation supports the microbiota balance in digestive system, improves digestion and absorption, and leads to better growth rate and feed conversion ratio (FCR).
2. Health promotion
3. Probiotic bacteria on the pond bottom also provides advantageous effect on the organic waste decomposition, minimizes the sediment and fouling odor in the pond.

### **Application as feed additive**

Directly mix 1 g BIOTA per 1 kg of complete feed, use regularly

### **Suggestion**

The probiotic feed additive BIOTA is not recommended during antimicrobial therapeutic or disinfectant application.

### **Recommendation for use**

For the application effectiveness, the regular feeding supplementation of BIOTA is recommended.

### **Application to maintain of water quality**

1. Apply 1 kg BIOTA per 6,400 square metres.
2. Competitive inhibition against growth of opportunistic pathogens.
3. Balance pond ecology with advantageous microflora.
4. Minimize organic waste, fouling odors, sludge, or pollution in the aquaculture environment.
5. Different species of Bacillus in BIOTA draw synergistic probiotic effect, BIOTA works effectively in both anaerobic and anaerobic conditions.
6. The probiotic BIOTA should be applied regularly through an entire crop until harvest.





## Use of **BIOTA** in livestock development:

BIOTA decomposes animal waste and efficiently control undesirable odor from livestock manure.

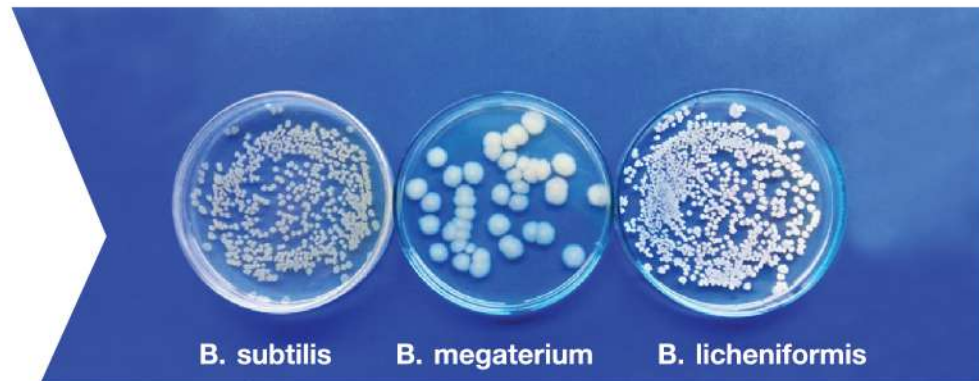
### Benefits of BIOTA dietary supplementation

1. Balance the underlying gut microbial and provide efficient feed utilization. Health promotion and FCR efficacy.
2. Minimize the undesirable odor, particularly toxic Nitrogen compound such ammonia

**Different species of Bacillus; B. subtilis, B. licheniformis and B. megaterium** BIOTA draw synergistic probiotic effect, BIOTA works effectively in both aerobic and anaerobic conditions.

The culture of BIOTA product contains 3 species of live Bacillus

Synergistic effect of probiotic Bacillus in BIOTA enhances the feed utilization, increases growth rate and grow competitively against the opportunistic pathogens. The probiotic Bacillus passed over the animal waste are also beneficial in decomposition of animal manure, thus controlling the unfavored odor or environment.





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