

From the above figure, 2kg/t sodium butyrate added in the feed can improve WGR and SGR, as well as decrease feed coefficient, which improves feed efficiency; sodium butyrate can significantly increase the survival rate of prawns and enhance the disease resistance of prawns.

#### Usage & dosage

##### 【Dosage】

Species	Special aquaculture animals	Freshwater fish
Ration	1-2Kg/T	500-800g/T

##### 【Note】

1. In order to ensure uniformity in the feed, the use of this product need to be premixed firstly, and then gradually added to the follow-up feed.

2. This product is used as soon as possible after unpacking, the remaining parts need to tie up and keep in dark place.

##### 【Packaging & Storage】

This product is packaged in a box or a bag, the net weight of product is 20kg or 25kg, see the package label.

##### 【Shelf life】

Under the condition of original package, the storage life is 12 months.

#### HUNAN PERFLY BIOTECH CO., LTD.

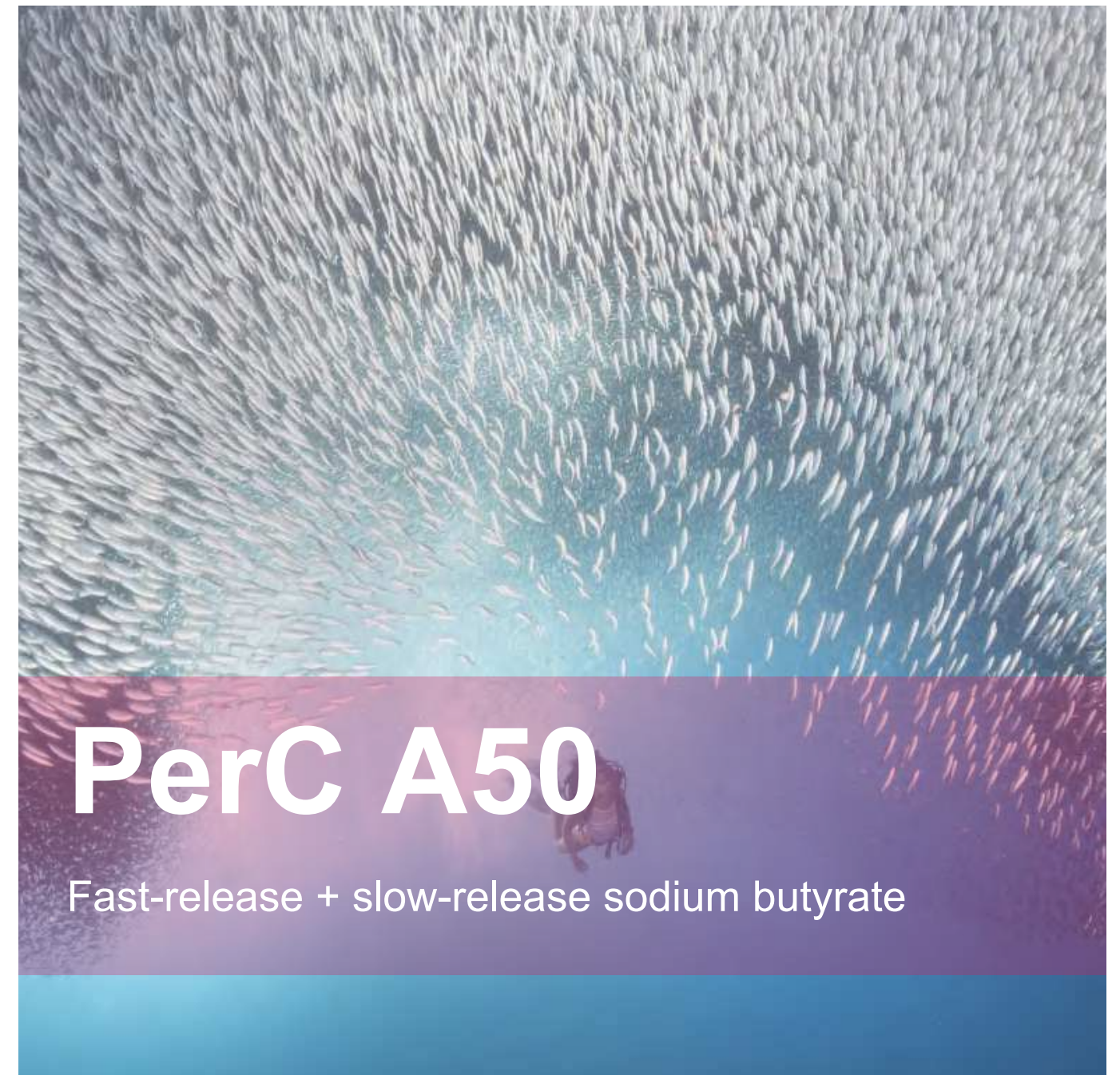
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V 1.0



PerC A50 is produced by Hunan Perfly Biotech Co., Ltd., according to the short intestine and low body temperature of aquatic animals. PerC A50 is a kind of product that makes sodium butyrate released in the aquatic animals' intestine sustainably to reach hindgut by combination of fast-release and slow-release technologies.

### Guaranteed analysis value

1. Main ingredients: sodium butyrate, special coating materials
2. Guaranteed value: sodium butyrate  $\geq 50\%$

### Intestinal healthy and sodium butyrate

Compared with terrestrial animals, aquatic animals' digestive tract has their features, firstly, aquatic animals' intestine is short and simple. The staying time of food in intestine is shorter than that of livestock. The time of enzymatic digestion and absorption is short, so that the ability of fishes to digest and absorb nutrients is weak. Secondly, aquatic animals' intestinal wall is thinner, which is 1/20 of that of mammals. As a result, it is easier to be damaged. Thirdly, polyunsaturated fatty acids (PUFAs) of aquatic animals' intestine are far more than those of terrestrial animals. PUFAs are easy to be oxidized, which leads to the oxidative damage of fat in aquatic animals' intestine.

Lastly, only carnivorous fishes that account for small parts have gastric, and cyprinid fishes haven't gastric. Therefore, compared with terrestrial animals, some aquatic animals' intestine undertakes both digestion and absorption. As aquatic animals' digestive tract connects with the external environment, the health and stability of intestine is especially important.

In the process of aquaculture, many factors could affect the intestinal health of aquatic animals, for example, high content of soybean is in aquatic feed, in which anti-nutritional factors trigger the intestinal oxidative damage and structural damage; in addition, mycotoxins and peroxides in feed can directly damage mucosal cells in intestinal wall, which causes the intestinal wall functions to decrease, causing bacillary enteritis, increasing the permeability of the intestinal mucosa, and making toxic and harmful substances easy to invade.

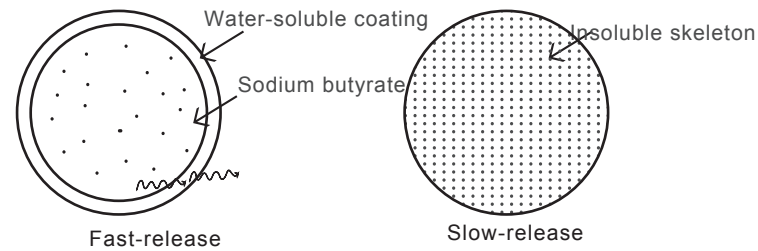
Sodium butyrate can promote the growth of aquatic animals by improving feed efficiency and intestinal health and promoting intestinal development. In normal physiological conditions, sodium butyrate can promote the proliferation and the growth and development of animals' intestinal cells. In the case of intestinal damage, sodium butyrate can repair intestinal tract by inhibiting intestinal inflammations to improve the barrier functions of intestine, which makes the intestine in good health, maintaining intestinal health, and improving production performance of aquatic animals.

### Characteristics

#### 1. Stable quality without stinky

Special fat materials and water-soluble materials are used to coat sodium butyrate by special process, which can eliminate the losses of sodium butyrate during processing, storing, and feeding, and decrease the foul smelling to decrease the bad effects on workers.

2. The combination of water-soluble coating and insoluble skeleton to improve FCR.



Water-soluble sodium butyrate      Fat-soluble sodium butyrate

According to the short gut and low body temperature of aquatic animals, the technologies of fast-release and slow-release are adopted.

- 1) Fast-release technology--water-soluble coating covers foul smelling. After 10 minutes later, water-soluble coating dissolves and begins to release butyric acids. Half an hour later, butyric acids are released completely.
- 2) Slow-release technology –fat-soluble sodium butyrate is released in intestinal tract slowly to reach the hindgut.
- 3) The release amount of sodium butyrate in the whole intestine is more than 90.

### Efficacy

1. The utilization rate of sodium butyrate in the whole intestine is high, so that it can provide energy for intestinal epithelial cells quickly to promote the proliferation of intestinal cells and to repair damaged intestinal villi, which promotes the growth and improves WGR and feed coefficient.

2. Sodium butyrate can decrease the intestinal inflammation to improve intestinal immunity and the ability of intestine to resist oxidative damage and to maintain the structural integrity of intestinal mucosal epithelial cells, which decreases the intestinal diseases happened.

3. Sodium butyrate released covers the whole gut and reaches hindgut to inhibit the growth of harmful bacteria and to decrease the antibiotics dosage, which maintains the intestinal health and improves immunity by regulating the intestinal micro-ecology balance.

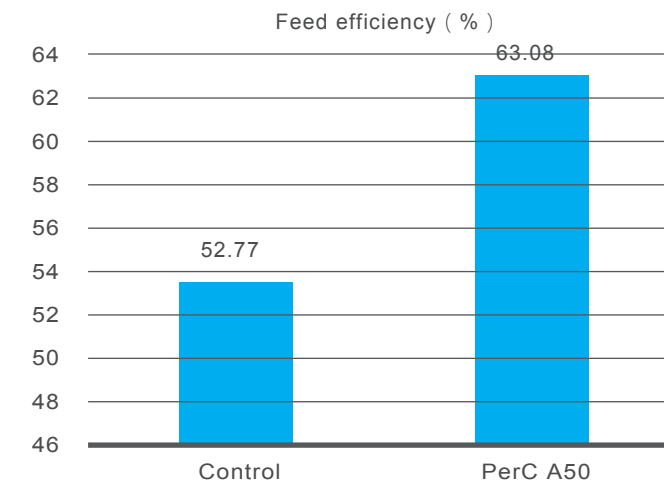
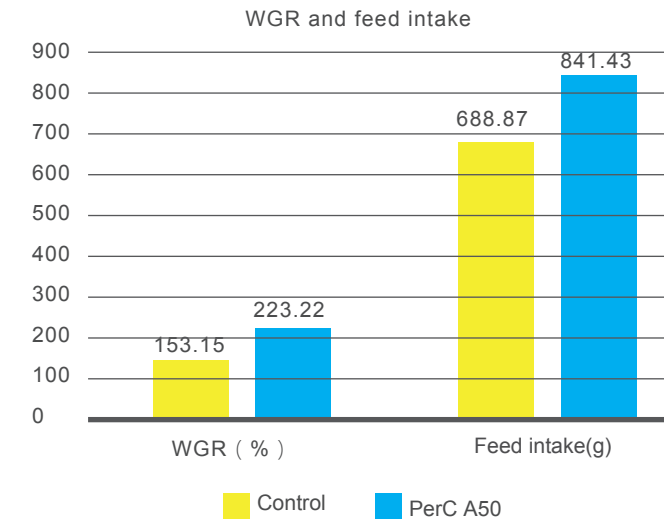
### Trial effects

#### 1. The application effect on grass carp

240 healthy grass carps were selected for this trial (average weight was  $237.13 \pm 0.89g$ ). They were randomly divided into two treatments, each treatment had three replicates, and each replicate had 40 grass carps.

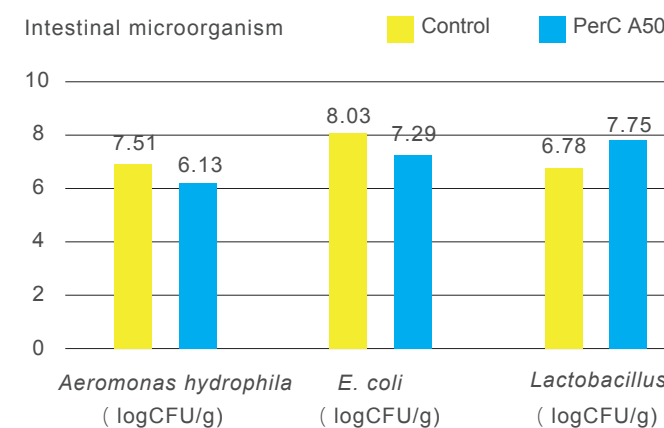
Treatment one was control group, 500g/t sodium butyrate was added in the test group based on the basic diets. Test period was 60 days.

#### 1) Production performance



From the above figure, 500g/T sodium butyrate added in the feed can improve WGR and feed intake, which improves feed efficiency.

#### 2) The effects on intestinal microorganisms

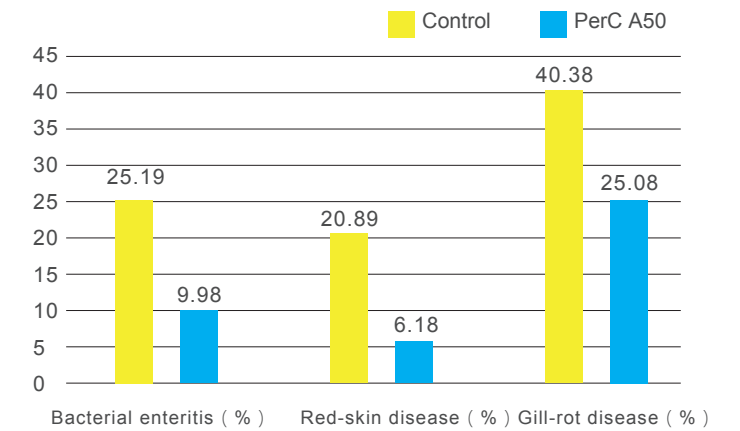


From the above figure, sodium butyrate can decrease the number of *Aeromonas hydrophila* and *E. coli*

in the grass carp intestine that is in the mid growth period, as well as improve the number of lactobacillus, which regulates the microbial balance in the intestine to maintain intestinal growth.

#### 3) The resistance to diseases

The disease incidence challenged by *Aeromonas hydrophila*



From the above figure, sodium butyrate can significantly decrease festered-bacterial gill-rot disease, red-skin disease, and bacterial enteritis of grass carp during the mid-growth period, which improves the ability to resist diseases for grass carp.

#### 2. The application effects on prawn

100 the initial weight of  $1.57 \pm 0.04 g$  prawns with healthy physical and similar specification were selected for this trial. They were randomly divided into 2 treatments, each treatment had 5 replicates, and each replicate had 10 prawns. Group 1 was control group; Group 2 was test group. 2kg/t sodium butyrate was added in test group based on the basic diets. The whole trial was done in the aquarium, and culture-cycle was 42 days.

