

# Dietary Sodium Butyrate Improves Performance Of Pacific White Shrimp



Testing was performed in biofloc tanks as well as clearwater systems.

## Bruno Corrêa da Silva

Empresa de Pesquisa Agropecuária e Extensão Rural de Santa Catarina  
Centro de Pesquisa e Desenvolvimento em Aquicultura e Pesca  
Antônio Heil Street, Km 6  
Itajaí, Santa Catarina, Brazil  
brunosilva@epagri.sc.gov

## Felipe do Nascimento Vieira

José Luiz Mourinho  
Walter Quadros Seiffert  
Universidade Federal de Santa Catarina  
Departamento de Aquicultura  
Laboratório de Camarões Marinhos  
Florianópolis, Santa Catarina, Brazil

swine and poultry production, studies have shown benefits from dietary supplementation with butyrate, such as increased weight gain, feed efficiency and immunological parameters, along with benefits for intestinal mucus. However, despite its current commercial use in aquaculture, studies of sodium butyrate's effects in marine shrimp diets have been limited.

## Shrimp Performance In Clearwater

With the financial support of the Brazilian Ministry of Fisheries and Aquaculture and the Financier of Studies and Projects, the authors conducted studies at the Universidade Federal de Santa Catarina in Brazil to evaluate the potential use of sodium butyrate as a feed addi-

### Summary:

With the use of antibiotics increasingly limited, aquaculture has sought new feed additives to improve the nutrition and health of aquatic animals. Sodium butyrate has potential as an additive for marine shrimp diets, improving both the balance of intestinal bacterial flora and performance of the shrimp. In research using both clearwater and biofloc systems, shrimp that received diets supplemented with sodium butyrate had higher survival and productivity. Sodium butyrate also had an antimicrobial effect against three *Vibrio* strains.

The emergence of bacterial diseases such as early mortality syndrome, caused by a strain of *Vibrio parahaemolyticus*, has caused negative impacts on the production of marine shrimp. With the use of antibiotics in animal production prohibited in many countries due to environmental problems and the selection of resistant bacteria, the industry has sought

new feed additives to improve the nutrition and health of aquatic animals.

The use of organic acids and their salts in animal production has gained attention in recent years. These additives may promote benefits to cultured animals that include inhibiting pathogenic bacteria in the gastrointestinal system, development of highly available energy, increased absorption of macro- and micronutrients in diets and, therefore, greater productivity.

Among the organic acids, sodium butyrate deserves special attention. In

**Table 1. Growth performance of *L. vannamei* cultured in clearwater with dietary supplementation of sodium butyrate at different concentrations.**

Treatment	Final Weight (g)	Survival (%)	Feed Efficiency	Yield (kg/ha)
Control	9.3 ± 0.9 <sup>a</sup>	88.7 ± 0.6 <sup>a</sup>	0.53 ± 0.03 <sup>a</sup>	992 ± 89 <sup>a</sup>
Butyrate 0.5%	10.6 ± 0.2 <sup>b</sup>	92.3 ± 1.5 <sup>ab</sup>	0.59 ± 0.01 <sup>ab</sup>	1,176 ± 5 <sup>b</sup>
Butyrate 1.0%	10.3 ± 0.1 <sup>b</sup>	89.3 ± 0.6 <sup>ab</sup>	0.55 ± 0.01 <sup>ab</sup>	1,100 ± 0 <sup>b</sup>
Butyrate 2.0%	10.8 ± 0.5 <sup>b</sup>	93.0 ± 1.4 <sup>b</sup>	0.61 ± 0.01 <sup>b</sup>	1,237 ± 23 <sup>b</sup>

**Table 2. Growth performance of *L. vannamei* cultured in biofloc systems with dietary supplementation of 2% sodium butyrate.**

Treatment	Final Weight (g)	Survival (%)	Feed Efficiency	Yield (kg/ha)
Control	13.3 ± 0.3	76.5 ± 0.5 <sup>a</sup>	0.45 ± 0.05	25,400 ± 1,500 <sup>a</sup>
Butyrate 2%	13.3 ± 0.5	81.6 ± 2.8 <sup>b</sup>	0.46 ± 0.06	27,110 ± 460 <sup>b</sup>