



ProPhorce™ SR for Aquaculture

An ocean of benefits in gut health

ProPhorce™ SR:

- supports gut health and gut integrity
- enhances nutrient digestibility and growth performance
- has been thoroughly tested

Unique challenges in a rapidly growing market

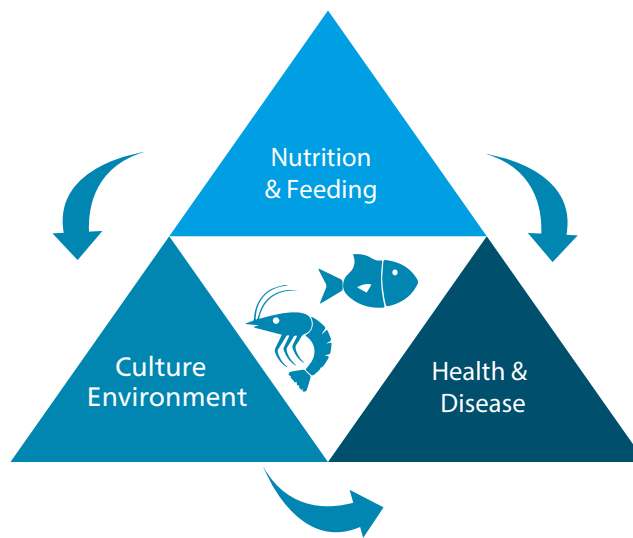
It is suggested by the Food and Agriculture Organization of the United Nations (FAO) that aquaculture is the fastest growing food-producing sector globally. Farmed aquatic species account for a growing of our total food and protein consumption each year. According to the FAO, aquaculture has been the fastest growing food sector for over a decade; total global aquaculture production estimated

at over 120 million tones in 2019 and valued at over US \$ 270 billion, with the sector growing at an average annual rate of 3.7% per year since 2015. Moreover, over 90% of total global aquaculture production originates from the Asian region, with the top five global producers in 2019 being China (57% of total global production), followed by Indonesia, India, Viet Nam and Bangladesh.



Keeping the flow

Aquatic species are sensitive to a number of stressors.



Source: Tacon, 2021



Culture Environment

- Deteriorating environmental conditions
- Sub-optimal water quality
- Algal blooms & crashes
- Competing bacteria flora & fauna



Nutrition and feeding

- Sup-optimal feed
- Poor ingredient quality
- Anti-nutrients & mycotoxins
- Poor feed management

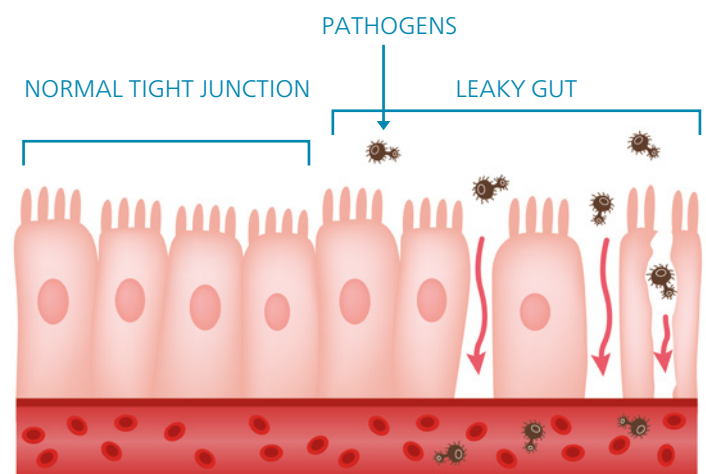


Health and disease

- Infectious disease agents
- Bacteria & viruses
- Fungi & toxins
- Parasites & injuries

The impact of stressors on gut integrity

- Stress within animals may reduce feed intake and trigger immune response and inflammation in the gut
- Major gut functionalities such as nutrient uptake and barrier function may be compromised
- Inefficient barrier function leads to "leaky gut" where pathogens and toxins are able to pass into the blood stream
- Compromised gut integrity has a negative impact on health and performance



ProPhorce™ SR: an ocean of benefits in supporting gut health

Feed is the highest operating cost item of fish and shrimp farming operations. As a means of reducing feed costs, plant-based ingredients are now routinely used in most aquaculture feeds. However, these ingredients may contain Anti-Nutritional Factors (ANFs) and mycotoxins which have been shown to have a negative effect on gut integrity and gut health, this may result in a condition known as 'leaky gut', reduced nutrient digestibility, reduced immune capability, and increased susceptibility to environmental pathogens and diseases.



Thoroughly tested

- Supports intestinal integrity and nutrient digestibility
- Improves feed intake and FCR
- Improves immune status and control of oxidative stress
- Delivers superior animal performance



Superior handling

- Insoluble in water
- Thermostable on pelleting
- No odor issues
- Available in liquid and dry forms

All of these nutritionally-induced stress factors may compromise the structure of the gut, resulting in the tight junctions not functioning as they are intended to, this is known as 'leaky gut'.

Butyrins: a game changer in gut health

Butyrins are a game changer by directly improving gut structure and function in fish and shrimp fed plant-based diets. Butyrins are insoluble fats which release butyric acid in the intestine which has multiple beneficial effects, including:

- Improving villi development and maximizing nutrient digestibility
- Improving gut integrity and formation of tight junctions
- Supporting gut microbiota diversity, balance and natural defenses
- Supporting gut resilience after nutritional challenges (ANFs, mycotoxins)

ProPhorce™ SR is a butyrim-based product manufactured in the EU, using state of the art ester technology resulting in the effective release of butyric acid where it is most needed.

Superior results

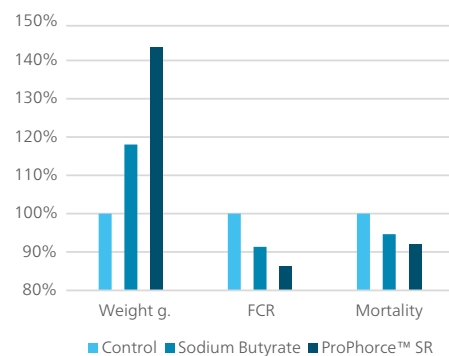
The effects of ProPhorce™ SR help maintain gut health and integrity which are reflected by the results observed in trials carried out with different aquatic species.

Shrimp

Shanghai Ocean University (China)

Trial with Pacific white shrimp to compare the growth performance of shrimp fed 3 practical diets: Control diet, a diet containing (0.2%) Sodium Butyrate, and a diet containing (0.05%) ProPhorce™ SR by weight over a 60-day growth period.

Shrimp performance



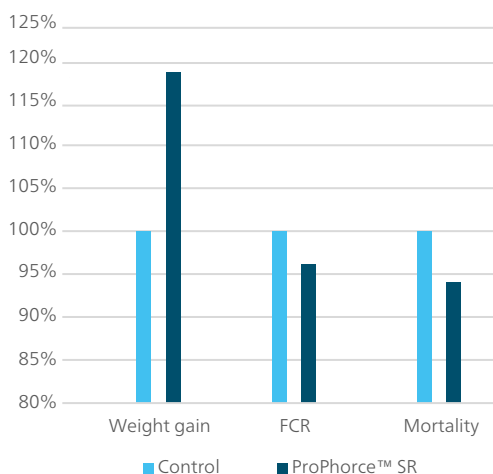
Results: ProPhorce™ SR outperforms the other two treatments with significant differences ($p < 0.05$) for weight gain, FCR and mortality.

Tilapia

Can Tho University (Viet Nam)

Trial with Red tilapia to compare the growth performance of fish fed 2 practical diets: Control diet, and a diet containing (0.05%) ProPhorce™ SR over a 100-day growth period.

Red tilapia performance



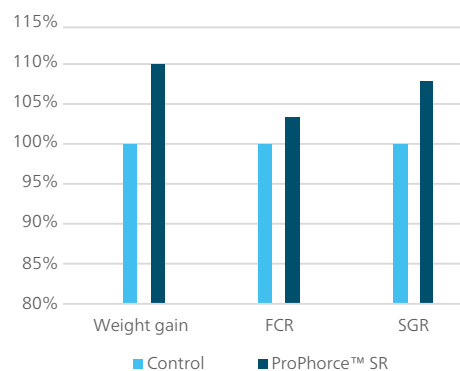
Results: ProPhorce™ SR outperforms control group with significant differences ($p < 0.05$) for weight gain. FCR and mortality rate improved numerically.

Common carp

Commercial farm (China)

Trial with Common carp on a commercial farm to compare the growth performance of fish fed 2 diets: a commercial Control diet, and the same diet supplemented with (0.05%) ProPhorce™ SR over a 4-month growth period.

Common carp performance



Results: ProPhorce™ SR outperforms control group with significant differences ($p < 0.05$) for weight gain. FCR and SGR improved numerically.

ProPhorce™ SR - key facts

- Helps to maintain optimal animal growth potential
- Supports the maintenance and repair of tight junctions
- Improves natural defenses to better protect from ANFs and antioxidant capabilities
- Supports the establishment of a healthy gut microbiota
- Improves tolerance to high use of dietary plant protein sources



ProPhorce™ SR is the solution of choice for the aquaculture business. Do you want to know more? Please contact your local Perstorp representative or send an email to animal.nutrition@perstorp.com

Devoted to your success

Specialist

Perstorp Animal Nutrition is a global specialist in acid-based solutions with over 60 years of experience. We know the importance of gut health and feed preservation for the livestock industry. Therefore, we have focused our skills, knowledge and resources on finding new ways to improve gut health and preservation. Thanks to this dedication, we are the first in developing next generation solutions that exceed your expectations.

Swedish multinational

As Perstorp Animal Nutrition, we belong to the Swedish multinational Perstorp Group – a basic producer of organic acids such as propionic acid, formic acid and butyric acid. As a part of the Perstorp Group, we can take advantage of an extensive amount of knowledge accumulated since 1881, joint R&D facilities and our own production facilities in Europe, North America and Asia. As Animal Nutrition we operate independently, flexibly and close to our markets.

Agricultural lifeline

Our highly knowledgeable and motivated team has an agricultural lifeline. Being in close contact with farmers and the feed industry drives our dedication in adding value to your business. We challenge ourselves constantly to enhance gut health and preservation for better performance, feed efficiency and daily weight gain: for your business.

Perstorp Animal Nutrition:

Dedicated specialist in gut health and preservation. Devoted to success.