PAQ-Protex™

It all starts with a healthy gut

Protecting your investment, naturally.

PAQ-Protex™ nutritional speciality product is a natural feed additive especially designed for aquaculture.

PAQ-Protex contains a unique saponin blend from *Yucca schidigera* and *Quillaja saponaria* plants proven to improve gut health and immunity in shrimp.

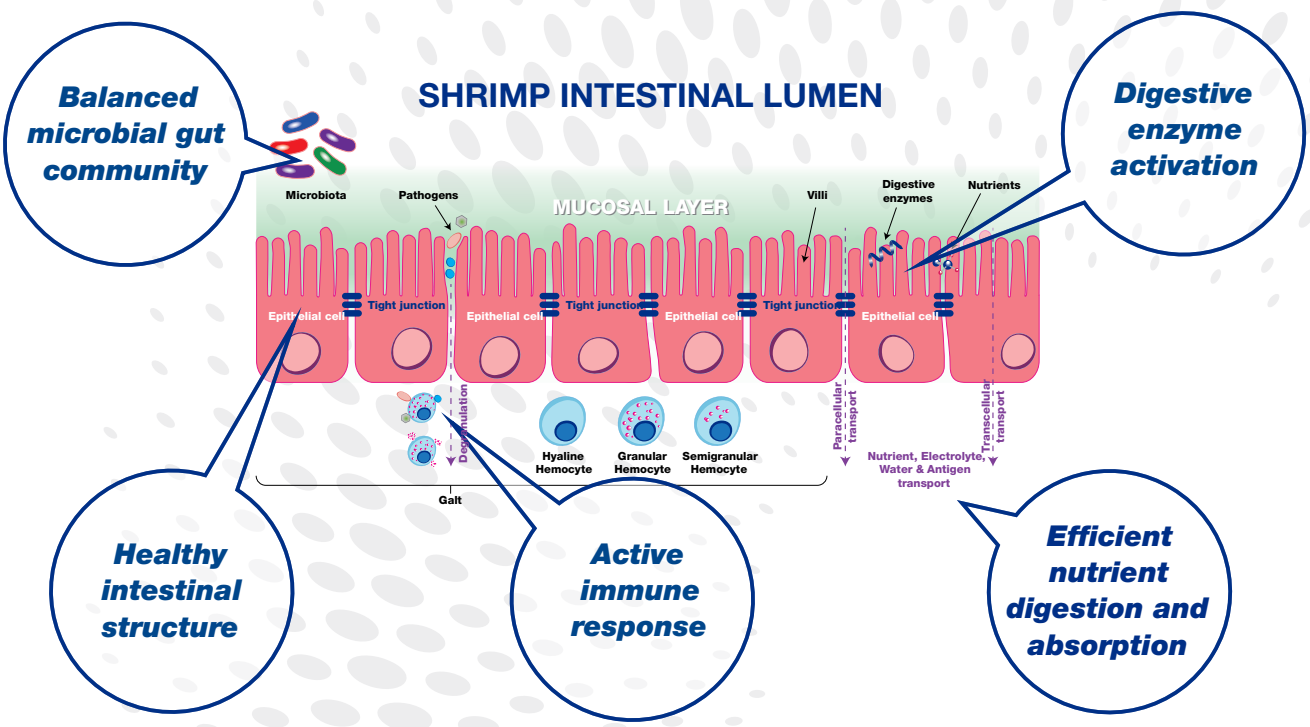
A healthy gut is the foundation for superior production performance.

What is optimal gut health?

- A stable and beneficial microbial community
- Optimal intestinal structure and morphology
- Efficient production of digestive enzymes
- Efficient digestion and absorption of nutrients
- A balanced immune response

The benefits of a healthy gut can be:

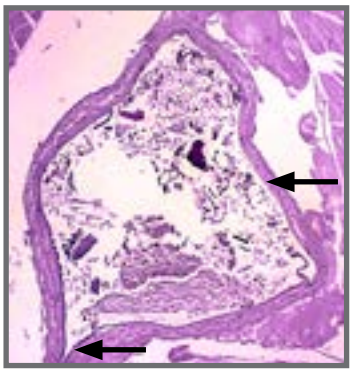
- Improved FCR and yield
- Better growth performance
- Higher survival rates
- Lower mortality due to disease challenges
- Effective pathogen elimination



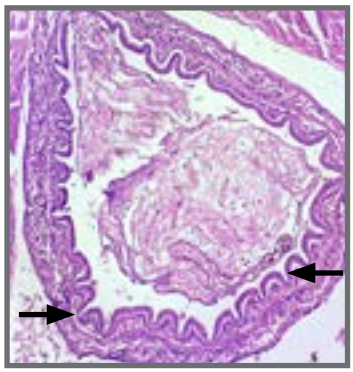
PAQ-Protex has consistently demonstrated improved gut health and immune response across all major aquaculture regions in the world, and is scientifically proven to support gut health for shrimp producers.

Healthy Intestinal Structure:

A study conducted in shrimp (*Liptopenaeus vannamei*) of 2g initial mean weight, in eight replicates of control groups not fed PAQ-Protex, and treatment groups fed 2kg/MT feed with PAQ-Protex, showing enhanced intestinal structure of shrimp when fed PAQ-Protex (*Phibro internal data*).



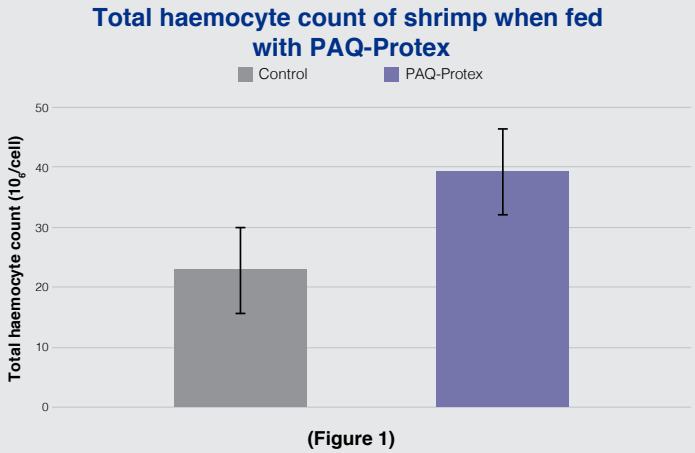
Shrimp not fed PAQ-Protex - Grade 0
(low level to no intestinal folds)



PAQ-Protex fed shrimp - Grade 4
(high level of intestinal folds)

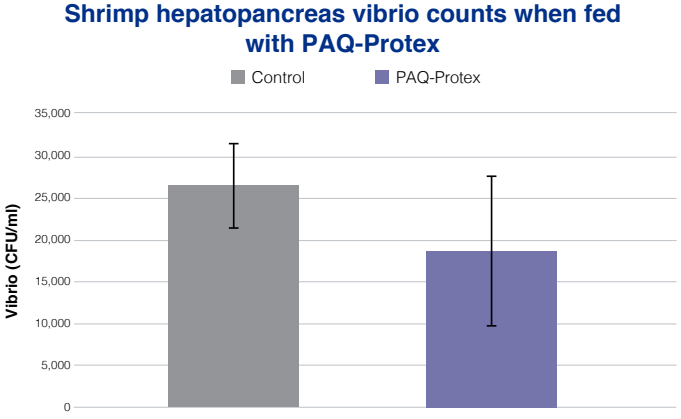
Active Immune Response:

A study conducted in shrimp (*Liptopenaeus vannamei*) of 4g initial mean weight, in six replicates of control groups not fed PAQ-Protex, and treatment groups fed 2kg/MT feed with PAQ-Protex, showing elevated levels of important immune cells of shrimp when fed PAQ-Protex (*Phibro internal data*). (Figure 1)

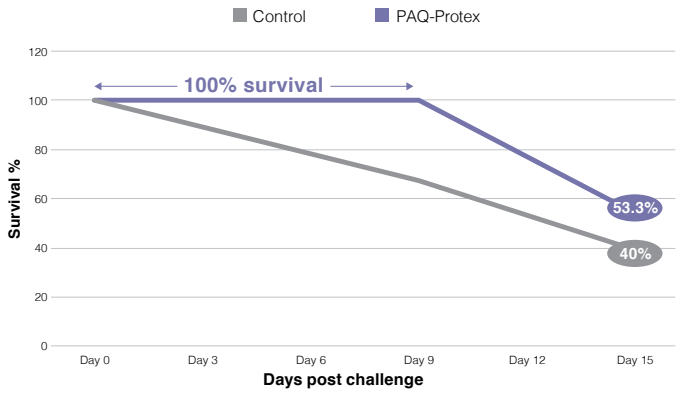


(Figure 1)

A study conducted in shrimp (*Liptopenaeus vannamei*) of 2g initial mean weight, in six replicates of control groups not fed with PAQ-Protex, and treatment groups fed 3kg/MT feed with PAQ-Protex, showing reduced bacterial counts and improved survival of shrimp after infection with *Vibrio parahemolyticus* when fed PAQ-Protex (Phibro internal data). (Figure 2 and 3)



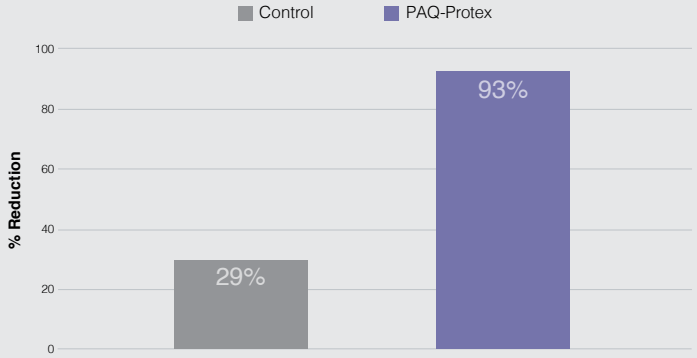
(Figure 2)



(Figure 3)

A study conducted in shrimp (*Liptopenaeus vannamei*) with control groups not fed PAQ-Protex, and treatment groups fed 5kg/MT feed with PAQ-Protex, showing reduced gregarines counts when fed PAQ-Protex (*Phibro internal data*).

Reduction in intestinal gregarines count when fed with PAQ-Protex

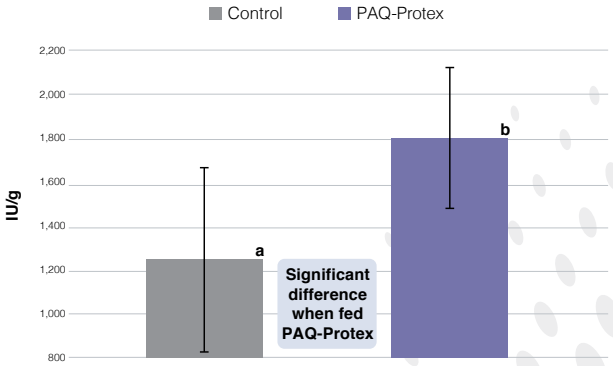


(Figure 4)

Digestive Enzyme Activation:

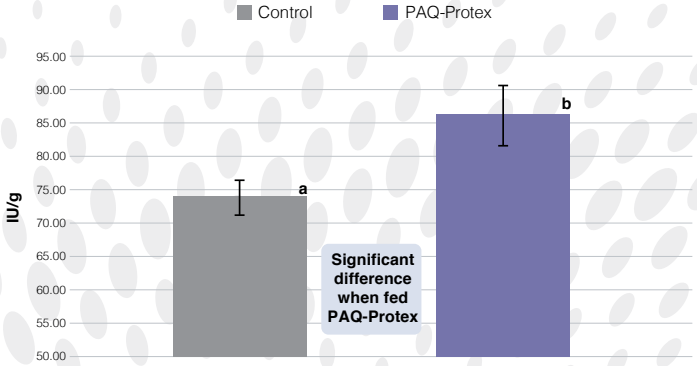
A study conducted in shrimp (*Liptopenaeus vannamei*) of 2g initial mean weight, in four replicates of control groups not fed PAQ-Protex, and treatment groups fed 2kg/MT feed with PAQ-Protex, showing increased digestive enzyme activity when fed PAQ-Protex (Phibro internal data).

Amylase levels in the shrimp gut when fed with PAQ-Protex ($P < 0.05$)



(Figure 5)

Protease levels in the shrimp gut when fed with PAQ-Protex ($P < 0.05$)

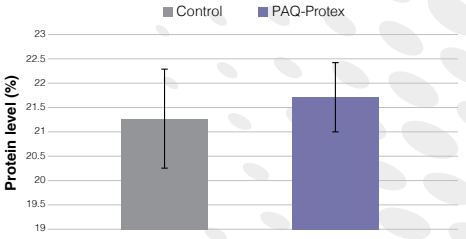


(Figure 6)

Efficient Nutrient Digestion and Absorption:

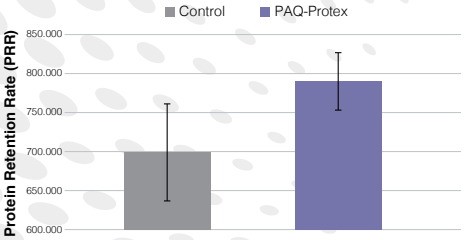
A study conducted in shrimp (*Liptopenaeus vannamei*) of 4g initial mean weight, in six replicates of control groups not fed PAQ-Protex, and treatment groups fed 2kg/MT feed with PAQ-Protex, showing elevated protein levels and protein retention, and improved amino acid profile when fed PAQ-Protex (Phibro internal data).

Protein level of shrimp when fed with PAQ-Protex



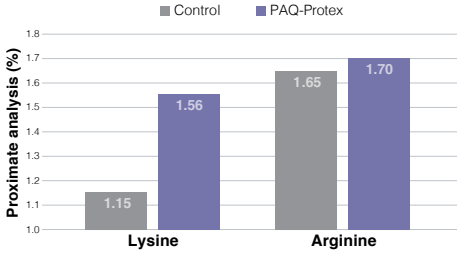
(Figure 7)

Protein retention of shrimp when fed with PAQ-Protex



(Figure 8)

Amino acid profile of shrimp when fed with PAQ-Protex

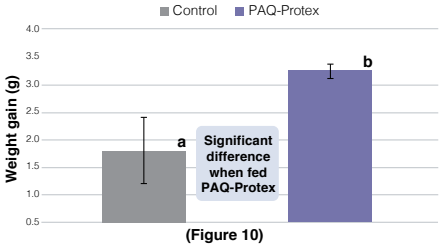


(Figure 9)

Improved gut health and immunity leads to better performance when using PAQ-Protex:

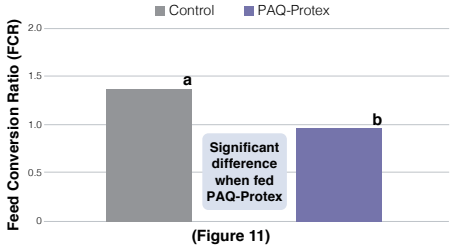
A study conducted in shrimp (*Liptopenaeus vannamei*) of 2g initial mean weight, in 3 replicates of control groups not fed PAQ-Protex, and treatment groups fed 2kg/MT feed with PAQ-Protex, showing a significant increase in weight gain and FCR, and an 18% increase in yield, when fed PAQ-Protex (Phibro internal data)

Individual weight gain (g) of shrimp when fed with PAQ-Protex ($P < 0.05$)



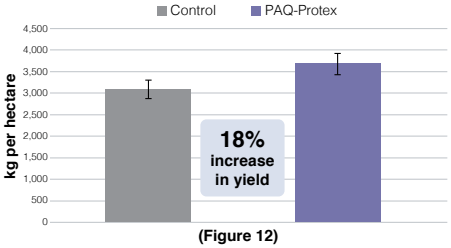
(Figure 10)

Feed Conversion Ratio (FCR) of shrimp when fed with PAQ-Protex ($P < 0.05$)



(Figure 11)

Total production yield in shrimp when fed with PAQ-Protex



(Figure 12)

PAQ-Protex, supporting shrimp gut health and immunity in aquaculture operations around the world.

Active Immune Response

Triggers lysozyme activity and innate immune systems.
Promotes parasite and bacterial pathogen elimination.
Promotes antioxidant, free-radical and anti-inflammatory activity.

Healthy Intestinal Structure

Increases villi numbers and folding.
Increases villi height and width.
Improves gut cell wall permeability.

Digestive Enzyme Activation

Enhances lipase, amylase and protease activity.
Improves digestibility of fatty acids.
Elevates total protein levels.
Increases protein synthesis.

Better Performance

Improves FCR, total biomass, survival and growth performance of shrimp.

Efficient Nutrient Digestion

Higher cell membrane permeability.
Greater protein and lipid accretion.

Scan for more information

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