

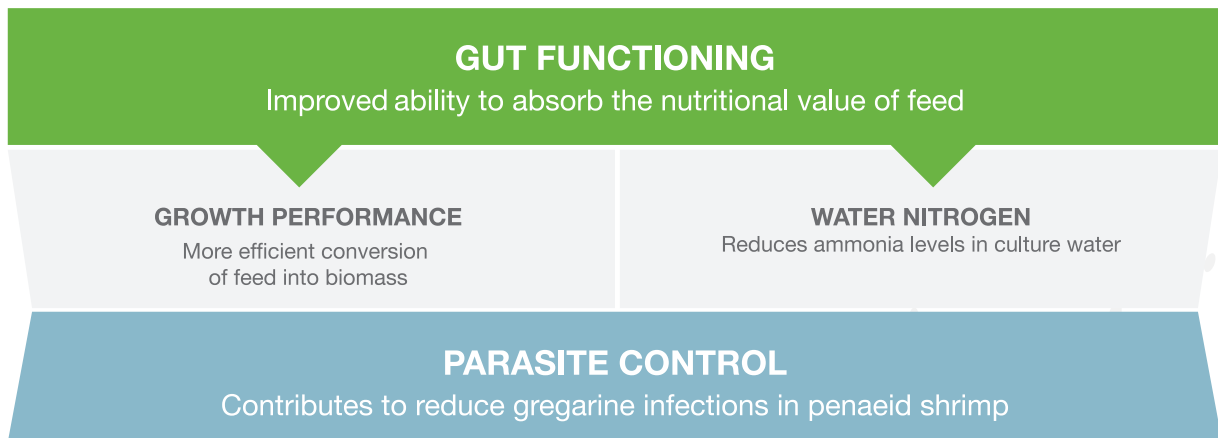


# PAQ-Protex™

## Natural protection for superior growth

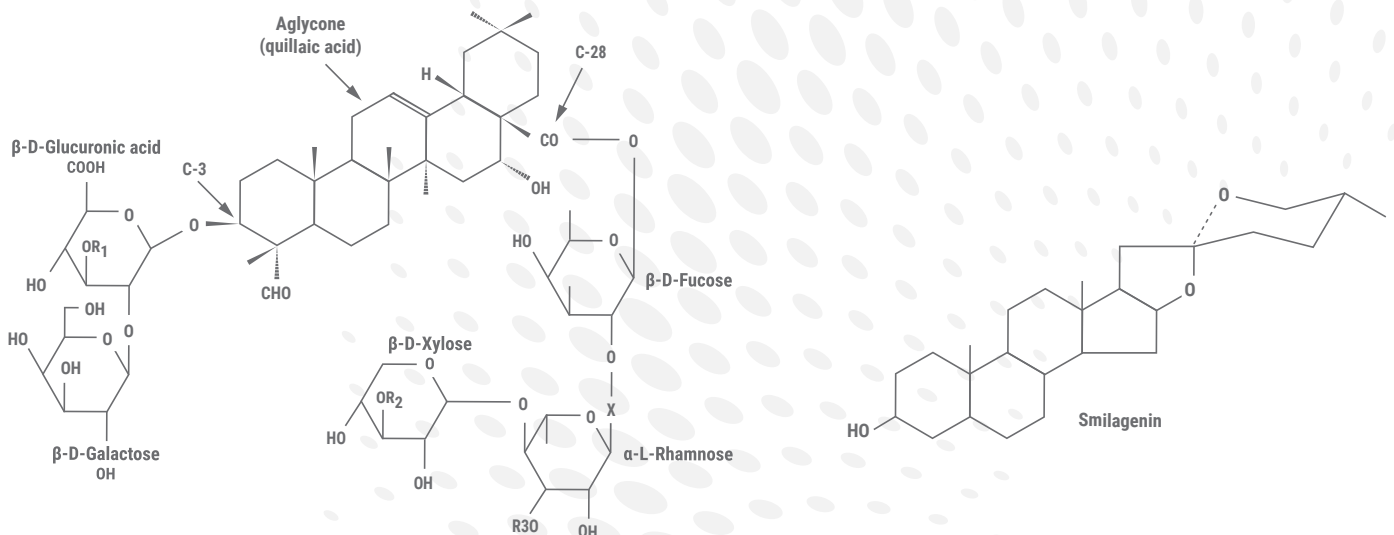
PAQ-Protex™ is a natural feed additive especially designed for shrimp. It contains a saponin blend from *Yucca schidigera* and *Quillaja saponaria* plants that:

- Promotes gut health and increases the ability to absorb nutrients from feed
- Improves feed conversion and growth performance
- Contributes to reduce the load of parasites in shrimp
- Reduces ammonia levels in the gut and in the culture water



### KNOWN EFFECTS OF SAPONINS

Saponins are a group of organic molecules synthesized by several plants, including *Yucca schidigera* and *Quillaja saponaria*. Most saponins show numerous beneficial properties, including antimicrobial and anti-inflammatory properties, as well as an improved gut nutrient absorption.



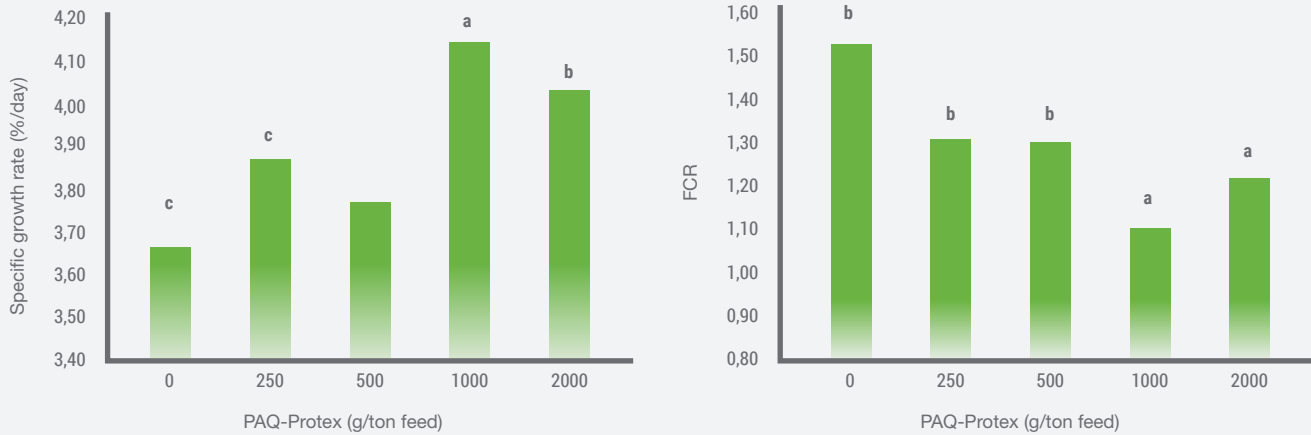
Structure of **Quillaja** saponin

Structure of **Yucca** saponin

# Benefits of PAQ-Protex™

PAQ-Protex™ increases shrimp growth by improving the feed conversion ratio and the absorption of nutrients from the feed.

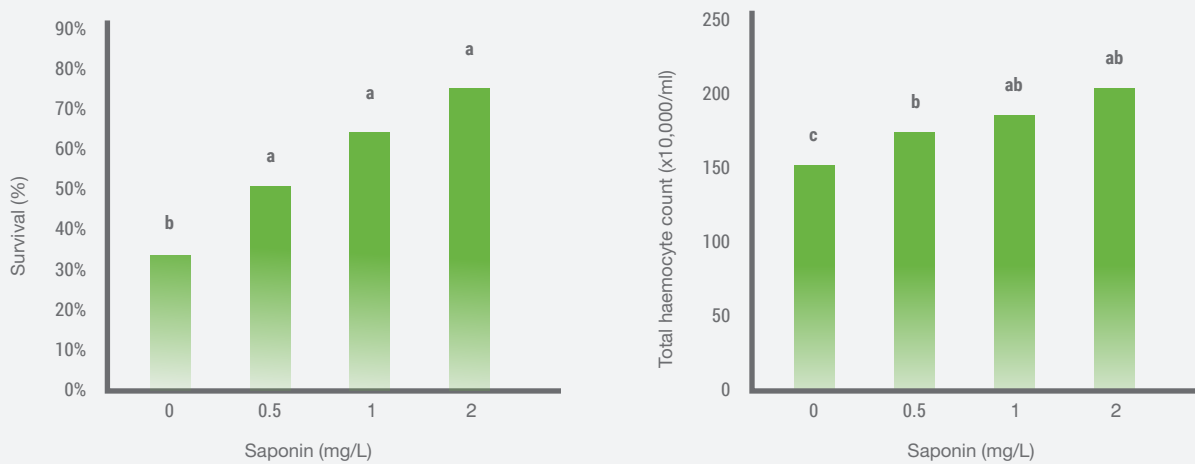
Adaped from Hernández-Acosta et al. 2016



Specific growth rate and feed conversion ratio (FCR) of Whiteleg shrimp (*L. vannamei*) fed a control or a PAQ-Protex™ supplemented diet at different dosages during 40 days. Different letters denote significant differences ( $p < 0.05$ ).

PAQ-Protex™ improves shrimp survival and immunological response.

Adapted from Sun and Chen 2008



Survival and total haemocyte count (THC) of Whiteleg shrimp (*L. vannamei*) immersed in *Quillaja saponin* suspension at different concentrations for 5 days. Different letters denote significant differences ( $p < 0.05$ ).

The saponins in PAQ-Protex™ also:

- Contribute to healthy intestinal tracks of shrimp by reducing the number of parasites
- Control ammonia levels in the water by facilitating its conversion to nitrate

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