

SEAWEED POWER

Inclusion of mixed seaweed powder in the diet of the Black Tiger shrimp *Penaeus monodon* and the white shrimp *Litopenaeus vannamei*

By Suzi Dominy

Oceanfeed™ -shrimp, a seaweed-based commercial shrimp feed ingredient produced by Ocean Harvest Technology Ltd. (OHT), contains a plethora of natural bioactive compounds, which, when incorporated in the diet, can modulate several functions in shrimp and assist in the control of chronic diseases and viral infections found in farmed shrimp. It allows for disease-free farmed shrimp to be reared in a more natural and sustainable way, easing concerns on environmental impact and sustainability. Oceanfeed-shrimp is the first marine natural and sustainable functional feed ingredient derived from macroalgae. The unique blend and processing guarantees that all bioactive ingredients are present in the final end product.

In 2010/11 OHT commissioned Research Diet Services, Wijk bij Duurstede, Netherlands, to manufacture shrimp feeds with different percentages and mixes of Oceanfeed, while replacing the mineral vitamin premixes. Crevatec, a shrimp consultancy and trial farm, was commissioned to conduct the trials with the manufactured shrimp feeds and compare against a high quality reference diet. At the end of the trial part of the shrimps were blast frozen and sent to M&J Seafood in the UK for taste testing.



Above: shrimp fed on Oceanfeed 15% with no fish meal.

Below: shrimp fed on reference diet.

After the growth trials OHT commissioned the Shrimp Research unit of the University of Ghent to conduct challenge tests to test for the effect of the inclusion of Oceanfeed on viral and bacterial diseases. After an eight week trial and a two week challenge test, the results showed a positive outcome of having Oceanfeed incorporated at 10% in the diet. The Black Tiger Shrimp *P. monodon* and White shrimp *L. van-*



Addition of Oceanfeed in the diets of *P. monodon* and *L. vannamei*



Trials with shrimp have shown:

Higher weight gain (shrimp fed with 10% Oceanfeed at harvest were 7% heavier on average than reference/control)

FCR lowered by 0.08-0.11 point

Uptake of pigmentation from algae in shrimp

40-50% lower mortality rates

No deformities or runts

Significantly improved taste and texture of the shrimp. Tested and proven with independent taste panels through M&J Seafood.

Improved survival and onset of mortality times if challenged with white spot viral disease and of vibrio

Improved environmental record due to no release of foreign synthetic matters in the feed. [Seaweed is a marine product harvested from the marine environment in a sustainable way].

namei fed an Oceanfeed diet at 10% inclusion while replacing all added vitamin and mineral premixes performed better in growth, weight gain and FCR compared to the reference diets with addition of minerals and vitamins.

P. monodon showed up to 50% lower mortality rates and a prolonged survival rate compared to the reference and other experimental diets. *L. vannamei* showed only prolonged survival times, however mortalities were the same amongst the different diets. Results show that a diet without fishmeal can still produce good quality shrimp with an FCR of 1.6 on average, well within the range set by the FAO of 1.2 To 1.8 for shrimp production. Other important differences to note:

- Reference diet was formulated to include added vitamin and mineral premix, OF10% and other experimental diets had no added vitamins and minerals.
- OF10% *monodon* shrimp biomass had 13.5% and *vannamei* 17.2% more biomass at the end of the trial than reference shrimp after 42 days. This is a 13.5 ton and 17.2 ton resp. increased yield per 100 tonnes.
- Feed Conversion Ratio (corrected for mortalities) was 0.08 better for OF10% *monodon* and 0.09 for *vannamei*. This is 8 and 9 tonnes respectively of feed per 100 tonnes of shrimp.
- Mortalities were improved on OF10% diet for *monodon* by 1.67%. and for *vannamei* on OF15% by 4%. This is 1.67 and 4 tonnes shrimp per 100 tonnes.
- Taste trials showed OF10 shrimp to be significantly better than reference, flesh being firmer and 'sweeter'



For references or more information about this trial, please contact [Colin Mair](#)





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