Utilization of Protein Hydrolysate from Shrimp Waste for Fishmeal Replacement in Formulated Feed of Pacific White Shrimp, *Litopenaeus vannamei* (Boone, 1931)

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Abstract

Utilization of protein hydrolysate from shrimp waste fermented with *Lactobacillus plantarum* strain 541 cultured with pine apple juice as protein source for fishmeal replacement of the Pacific white shrimp diets, *Litopenaeus vannamei* (Boone, 1931) at level 0 (control), 10, 20 and 30% for the treatment no. 1 (control), 2, 3 and 4 respectively. Four replicates in each treatment were cultured within the glass aquaria of semi-closed water system for 8 weeks. Initial average weight 1.12±0.01 g/shrimp were fed in each 30 shrimp/glass aquaria. Results showed that the high growth performance of shrimp in treatment no. 2, 3 and 4 found significant difference (P<0.05) when compared with the control (treatment no. 1). The highest survival rate found in the treatment no.3 which was not difference (P>0.05) when compared with the treatment no. 4. Feed conversion ratio (FCR) was not difference (P>0.05) among the treatment. Increase of fishmeal replacement had effectively to raise daily feed consumption. On the other hand the attractant study showed the highest values in the control treatment no. 1 which was not difference (P>0.05) when compared with the treatment no. 2 and no. 3. The protein sources evaluation of protein hydrolysate was demonstrated that protein digestibility, protein efficient ratio (PER) and apparent net protein utilization (%ANPU) were not difference (P>0.05) among all treatments. As energy digestibility, dry matter digestibility and the chemical composition analysis of whole shrimp were not difference in the treatment no. 2, 3 and 4 of the fishmeal replacement, respectively.

The replacement of fishmeal with protein hydrolysate at 30% was the highest level for decreasing fishmeal usage from this study because it could enhance growth performance, feed conversion ratio, survival rate and protein utilization. However, fishmeal replacement with protein hydrolysate in the diet will increase the feed cost. Therefore, at level 10% of fishmeal replacement with protein hydrolysate was not difference results when compared with 30%. Consequently, 10% of fishmeal replacement was an alternative for decreasing fishmeal usage and improving the growth and the others.

**Key words** : Pacific White shrimp, protein hydrolysate, shrimp waste, formulated feed

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