Shrimp Waste Protein Hydrolysate Utilization in Completed Feed for Growth of Asian Seabass (*Lates calcarifer* Bloch, 1790)

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**Abstract**

Protein hydrolysate product from shrimp waste was fermented with *Lactobacillus plantarum* strain 541 cultured in pineapple juice. The fermented broth were dried into protein hydrolysate powder by the vacuum freeze dryer (FD) and the spray dryer (SD) techniques. The both of protein hydrolysate powders were used for protein of fishmeal replacement at 0, 20, 40 and 60% was treatment no. 1 (control), 2, 3 and 4, respectively in four replicates for two sizes of asian seabass (*Lates calcarifer* Bloch, 1790).

The experiment 1, the completed feeds were replaced protein of fishmeal by protein hydrolysate FD was fed initial fish with an average body weight of 3.51±0.00 g during 6 weeks in the 1 ton of fiber tank containing 25 fish within semi-closed water system. The result presented that the protein hydrolysate FD at 20% of replacement level increased growth not statistically significant (P>0.05) when compared with control fish (0%). Although, at 40% (FD) of replacement level showed not statistically significant (P>0.05) in feed conversion ratio, survival rate, daily feed consumption and protein efficiency ratio when compared with the 20% (FD).

The experiment 2, the completed feeds were replaced protein of fishmeal by protein hydrolysate SD was fed initial fish with an average body weight of 1.24±0.00 g during 8 weeks in the same semi-closed water system with the tank containing 25 fish. The result showed that the all levels of replacement by protein hydrolysate SD were not improve growth statistically significant (P<0.05) when compared with control fish (0%). However, the 20% (SD) of replacement level showed not statistically significant (P>0.05) in feed conversion ratio, survival rate, daily feed consumption and protein efficiency ratio when compared with control fish (0%).

However, raise up of the both protein hydrolysates (FD and SD) were replaced in protein of fishmeal showed that the trend of growth, feed conversion ratio, daily feed consumption and protein efficiency ratio were decreased. In addition, the quality of protein hydrolysate had an effect on growth at difference weight or size of fish. As a result, the 20% (FD) of replacement level was the optimum protein requirement for fish. Nevertheless, the protein hydrolysate SD should use less than 20% of replacement level for small size of fish. Furthermore, freeze-drying is the best process for preserve nutrition quality, structure and organoleptic of protein hydrolysate product.

**Key words:** protein hydrolysate, shrimp waste, asian seabass, completed feed

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