

Suthin Somboon 2009: The Effect of Betaine on Osmoregulation, Blood Components and Immune System of Black Tiger Shrimp (*Penaeus monodon*, Fabricius) in a Environmental Change. Master of Science (Aquaculture), Major Field: Aquaculture, Department of Aquaculture. Thesis Advisor: Associate Professor Prathak Tabthipwon, Doctorat de 3 cycle. 98 pages.

Osmoregulation, blood components and immune system of isonitrogenous diets (38% crude protein 6% lipid and digestibility energy of 2,500 kcal/kg.) containing 1% and 2% of betaine were determined for juvenile *Penaeus monodon* (average weight 4.0 g). After 3 months feeding trial, the weight gain and rate of survival significantly increased with the betaine supplementation up to 1 and 2% of diet. ($p < 0.05$). Protein efficiency ratio and feed conversion ratio would not be affected with betaine supplemented into the diet. The blood osmolality control, content of blood electrolyte ions (sodium, potassium and chloride), serum protein and blood glucose had no significant difference among treatment. The total haemocyte count and immune system based on phagocytic activity and phenoloxidase activity in shrimp fed with 1 and 2 % betaine in diet were higher than control group ($p < 0.05$).

The salinity tolerance test of shrimp fed with 1 and 2% betaine in diets was study under 20 ppt for normal condition to condition at higher salinity (40 ppt) and pH change from 7.5-8.0 to 5.5. The results indicated that shrimp could adapt well under experimental condition and betaine had no effect on survival of all group whereas the osmolarity and blood electrolyte in shrimp fed with betaine at 1 and 2 % were lower than control group. The immune system in all shrimp groups were decrease but there were not significantly different among groups ($p > 0.05$). The salinity tolerance test water at 0 ppt salinity suddenly changed were found highest mortality rate all shrimp group, shrimp were death within 12 hours. The results showed that diet supplemented with betaine at 1% was suitable for growth performance, osmosis balance, blood chemistry and immune system of shrimp in variable environment.

Student's signature

Thesis Advisor's signature

