

Bounsong Vongvichith 2006: Using Golden Apple Snail (*Pomacea caniculata*) Meal and Betaine in Lowland Frog (*Rana rugulosa*) Feed. Master of Science (Aquaculture), Major Field: Aquaculture, Department of Aquaculture. Thesis Advisor: Assistant Professor Orapint Jintasatapron, Ph.D. 83 pages. ISBN 974-16-1582-5

The study on using golden apple snail (*Pomacea caniculata*) meal and betaine in frog (*Rana rugulosa*) feed was conducted to evaluate the attraction effect and osmoprotectant effect on temperature stress tolerance of betaine in frog feed and partial or total substitution golden apple snail meal for fish meal in feed on growth performance and feed efficiency in lowland frog (*Rana rugulosa*). The research was divided into 2 experiments. The first experiment: study on suitable form of feed, attraction effect and osmoprotectant effect on temperature stress tolerance of betaine in frog feed. The result indicated that pellet form showed the better growth performance than moist feed ($p < 0.05$) and supplemental betaine 1.5% in frog diets showed low responsibility on growth performance and feed efficiency ($P > 0.05$). The second experiment: study on substitution of snail meal for fish meal in frog feed. Four isonitrogenous ($43\% \pm 1\%$ crude protein) and isocaloric digestible energy (3,100Kcal/kg) diet were formulated containing 3 levels of snail meal 0, 50 and 100% snail meal substitution protein from fishmeal and 0% snail meal supplemental 1.5% betaine in diet. The result demonstrated that in young frog, effect of betaine on temperature stress tolerance showed low responsibility in high, ambient and cool condition. Young frog able to use golden apple snail meal replacing for fishmeal less than 50% in diets but grower frog able to use up to 100% in frog diets without any adverse effects. Supplemental betaine 1.5% in grower frog showed low responsibility growth performance and effect on feed efficiency. Osmo-protectant effects of supplemental betaine 1.5% in frog feed and apply for 2 month tended to increase osmolarity, chloride ion in frog blood and also increase hematological value (red blood cell, hemoglobin and hematocrit) then frog can tolerate temperature change both in high and cool temperature. Therefore, snail meal can substitute for 50% of protein from fishmeal (22.5% snail meal by weight) in young frog diet and up to 100% (45% snail meal by weight) in grower frog diet without any adverse effect. Supplemental 1.5% betaine demonstrated low responsibility on growth performance and feed efficiency and also low attraction effect. Betaine tends to exhibit the osmo-protectant effect in grower frog better than young frog.

Student's signature

Thesis Advisor's signature

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