Use of Optimal Protein Sources for Fish Meal Replacement in Milkfish (Chanos chanos Forsskal, 1775) Diet

Pitchaya Chainark1* Kowit Kaoeian2 Suparp Pripanapong1 and Suwanit Chainark3

1Phangnga Coastal Fisheries Research and Development Center  
2Trang Coastal Fisheries Research and Development Center 3Phuket Rajabhat University

Abstract

Study on optimal protein sources for fish meal replacement in milkfish (Chanos chanos Forsskal, 1775) diet was separated into two experiments: experiment 1, the effects of using different feed ingredients comprising of fish meal, soybean meal, rapeseed meal, corn meal, and distiller's dried grains with soluble (DDGS) on dry matter and protein digestibility were conducted on milkfish averaging 24.80±0.46 g. The study revealed that dry matter and protein digestibility obtained from fishmeal, soybean meal, and rapeseed meal provided higher protein digestibility than DDGS and corn meal (P<0.05), however, there were no significant differences in protein digestibility among fish meal, soybean meal, and rapeseed meal (P>0.05). The findings from the study indicated that it is more likely to substitute fish meal with rapeseed meal as an alternative protein source in a milkfish diet, due to high dry matter and protein digestibility values, 75.63±1.79 and 88.70±0.81%, respectively. Experiment 2 was further carried out on the effect of different levels of rapeseed meal substituted fish meal in milkfish pellet feed on growth of milkfish. The experiment was composed of 5 levels of protein percentage (0, 5, 10, 15 and 20% of crude protein) derived from rapeseed meal replaced fish meal. The fish, initial average weight 23.60±0.23 g, was grown out for 8 weeks. The study found that growth, feed efficiency ratio, and protein efficiency ratio of treatment 1 to 4 (0, 5, 10, and 15%) were greater than treatment 5 (20%) (P<0.05). Feed conversion ratio in treatment 5 was higher than the other treatments (P<0.05). No significant differences were observed on feeding rate, survival rate as well as milkfish carcass composition among 5 treatments (P>0.05). However, dry matter and protein digestibility in treatment 1 to 4 were greater than treatment 5 (P<0.05). No abnormalities of liver and intestine pathology of milkfish were found in all treatments. Therefore, rapeseed meal can be used for fish meal replacement in milkfish diets with optimum level of 15% crude protein.

Key words: feed ingredient, protein, apparent digestibility efficiency, milkfish (Chanos chanos Forsskal, 1775)

*164 Moo 9, Thaimaung Sub-district, Thaimaung District, Phangnga Province 82120 Tel. 0 7643 2212  
e-mail : pchainark@yahoo.com