

Replacement of fish meal with poultry by-product meal in diets formulated for the humpback grouper, *Cromileptes altivelis*

Abstract

An eight-week feeding trial was conducted to examine the possibility of replacing fish meal with poultry by-product meal (PBM) at high inclusion levels in the diets of the humpback grouper, *Cromileptes altivelis*, a carnivorous marine tropical fish. Six isolipidic (12%) and isoproteic (50%), experimental diets were formulated to contain graded levels of PBM. Fish meal protein was replaced with a feed-grade PBM at 50, 75 or 100% level (FPBM50, FPBM75, FPBM100, respectively), or a pet food grade PBM at 75 or 100% replacement level (PPBM75 and PPBM100, respectively). The control diet contained Danish fish meal as the sole protein source. The experimental diets were fed close to apparent satiation, twice a day to triplicate groups of humpback grouper fingerlings (12.4 ± 0.2 g). The grouper fingerlings were randomly distributed into groups of 15 fish in cylindrical cages (61 cm depth and 43 cm diameter) and placed in a 150-ton seawater polyethylene tank. Except for fish fed the FPBM100 diet, growth performance, survival, and feed utilization efficiency for fish fed PBM-based diets were not significantly lower ($P > 0.05$) compared to fish fed the control diet. The PBM source and dietary level did not significantly affect ($P > 0.05$) the hepato- and visero-somatic indices or the condition factor of fish. Dry matter and protein apparent digestibility coefficients (ADC) of the diets decreased with increasing dietary PBM, and ranged from 64.3-71.5% and 86.2 to 91.2%, respectively. High values (91.7 to 96.7%) for lipid ADC were observed in all diets, with no significant differences among dietary treatments. Whole-body moisture and lipid contents of the fish were not affected by the inclusion of PBM in the diets. With the exception of fish fed the FPBM100 diet, whole-body protein of fish fed the PBM-based diets was slightly higher than that of fish fed the control diet. There was a trend of increased whole-body ash with the increase in dietary levels of PBM. The results from this study indicate that good quality terrestrial PBM can successfully replace more than half the protein from marine fish meal in the diets for humpback grouper. However, total replacement of fish meal with PBM might be constrained by lowered nutrient digestibility

and limiting essential amino acids, especially lysine and methionine. © 2007 Elsevier B.V.
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