

**Effects of dietary fish oil replacement with vegetable oils on growth and tissue fatty acid composition of humpback grouper, *Cromileptes altivelis* (Valenciennes)**

**Abstract**

The replacement of dietary marine fish oil with vegetable oils was examined in fingerling humpback grouper, *Cromileptes altivelis*, over the course of an 8-week growth trial. Five isolipidic (10%) and isoproteic (50%) fish meal-based practical diets were formulated to contain iso-ingredients but with different sources of lipids [crude palm oil (CPO), refined, bleached and deodorized, palm olein (RBDPO), soybean oil (SBO) or canola oil (CNO)], and their performance was compared with the control diet, which contained cod liver oil (CLO) as the added lipid source. The experimental diets were fed close to apparent satiation twice a day to triplicate groups of fish ( $10.6 \pm 2.2$  g). The grouper fingerlings were randomly distributed into groups of 12 fish in cylindrical cages (61 cm depth and 43 cm diameter) that were placed in a 150 tonne polyethylene seawater tank. There were no significant differences ( $P > 0.05$ ) in terms of growth, survival, feed conversion ratio, protein efficiency ratio, net protein utilization, hepatosomatic index and condition factor among fish fed the various dietary treatments. Similarly, the dietary lipid source did not significantly affect the whole body proximate composition of the fish. Muscle and liver fatty acid composition of fish was influenced by the experimental diets. Replacement of dietary CLO with CPO, RBDPO, SBO or CNO produced fish with lower n-3 highly unsaturated fatty acids and increased levels of 18:2n-6 in the muscle and liver. The n-3:n-6 fatty acid ratio in the muscle of fish fed the CLO-based diet was 3.0 compared with 0.5-0.8 in the muscle of fish fed the various vegetable oil-based diets. The present study demonstrated that various vegetable oils can be used in fish meal-based dietary formulations for humpback grouper without compromising growth or feed utilization efficiency. © 2008 The Authors.