

Appraisal of Different Levels of Soybean Meal in Diets on Growth, Digestive Enzyme Activity, Antioxidation and Gut Histology of Tilapia (*Oreochromis niloticus*)

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Abstract : Replacement of fish meal with soybean meal is an effective way to relieve the pressure on fish meal as the supply of this feed ingredient is dwindling and certainly is not sustainable in long term at present levels in commercial feeds. This study was designed to determine the effect of fishmeal (FM) replacement with soybean meal (SBM) in diet on growth, digestive enzyme activity, antioxidation and gut histomorphology of tilapia (*Oreochromis niloticus*). Five diets were formulated where SBM0 contained 100% FM, FM substituted with graded levels of a mix of SBM to replace 25% (SBM25), 50% (SBM50), 75% (SBM75) and 100% (SBM100) of FM. Juvenile tilapia having weight and length of 6.60 ± 0.13 g and 5.42 ± 0.17 cm were randomly divided into five treatment groups having 40 individual each group and fed to visual satiation for 90 days. Diet with SBM was increased significant in body weight gain and specific growth rate in fish compared to the fish fed with SBM100. Fish having the similar weight (74.34 ± 5.41 g) fed the diets SBM50, SBM75 and SBM100 containing higher level of SBM showed significantly longer intestine compared to SBM0. Villus height of stomach and intestine were significantly greater in the fish fed with the diets SBM0, SBM25 and SBM50 compared to SBM100. Muscular thickness was inversely changed with the increasing villus height. Protease activity was increased significantly in stomach, anterior and posterior intestine of fish fed with SBM0 and SBM25 compared to SBM100. In anterior and posterior segment of intestine, significantly higher lipase activity was observed in fish fed with the diets SBM0 and SBM25 compared to diet SBM100. In stomach, amylase activity was also significantly greater in SBM0 compared to SBM100. The antioxidant enzymes including catalase and superoxide dismutase of liver were significantly ($P < 0.05$) higher in the *O. niloticus* fed SBM100 compared to the ones fed SBM0. These results suggest that the replacement of FM upto 75% with SBM could be possible considering the growth performances, gut health and activities digestive enzymes and antioxidant enzymes in *O. niloticus*.

Keywords : soybean meal, fish meal, digestive enzymes, anti-oxidant enzymes

Conference Title : ICFA 2020 : International Conference on Fisheries and Aquaculture

Conference Location : Toronto, Canada

Conference Dates : June 18-19, 2020