

Evacuation of Fish meal using Soy protein and Carbohydrate sources in diets of *Tilapia mossambicus* and its physiological alterations

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ABSTRACT:

Achieving factual sustainability in fish farming needs the addition of most of the fish meal exploited as feed stuffs. The current experiment described two feeding trials, that resulted in the complete replacement of fish meal in the fingerling of *Tilapia mossambicus*. The initial trial was accompanied with three stages of fish meal replacement (50, 75 and 100% of dietary protein) viz., one level of soy protein and two levels of Lactat[®] Probiotic (0 (or) 0.3% of the diet). Since probiotic has been reported to promote gut health, it was incorporated in order to examine the growth enhancement and whether it would ease high levels of fish meal replacement in *T. mossambicus*. Lipids were provided by Cod liver oil. The better weight gain was observed in the treatments 50/50⁺ of fish meal replacement and 0/100⁺ of fish meal replacement. The optimum Specific Growth Rate, Food Conversion Ratio and Survival were also observed in 50/50⁺ fish meal replacement and 0/100⁺ fish meal replacement. The higher serum Acetyl Choline, Leucocytes, and Erythrocyte were observed in 50/50⁺ and 0/100⁺ than the other diets. The Lysozyme activity was higher in 0/100⁺ and 50/50⁺ than the other diets.

In the Second feeding trial, fish meal was replaced by various carbohydrate sources on the growth performance and hepatic carbohydrate metabolic enzyme activities of the fingerlings of *T. mossambicus*. Five experimental diets were formulated to contain glucose, sucrose, maltose, dextrin, corn starch and control were maintained separately. The results indicated that the better weight gain, SGR, FCR and survival were also better in starch, dextrin and sucrose diet fed fish. There were significant differences in the total plasma, glucose and triglyceride concentration in fish fed with different carbohydrate sources. Plasma total protein, red blood cell, leucocytes and hemoglobin were significantly affected by various carbohydrate sources. The activities of glucose 6-Phosphate dehydrogenase, (G6PD), 6- Phospho fructokinase (PFK) and fructose 1, 6 – bisphosphatase (FBase) were significantly affected by these carbohydrate sources. While this two feeding trial indicated that the 50/50⁺ and 0/100⁺ of soy flour replacement with fish meal showed the optimum growth performance and in carbohydrate sources the corn starch, dextrose, and sucrose showed the better growth for tilapia fingerlings.

Keywords:

Fish meal replacement, probiotic, *Tilapia mossambicus*, growth