EFFECT OF FERMENTED SOYBEAN MEAL AS MAIN PROTEIN SOURCE ON GROWTH OF FISH FED NON-FISH MEAL DIETS

By

ALAA SAID HASSAN MOHAMED

B.Sc. Agric. Sc. (Animal Production and Fish resources), Suez Canal Univ, 2010

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ABSTRACT

Alaa Said Hassan Mohamed EL-karargey. Effect of Fermented Soybean Meal as Main Protein Source on Growth of Fish Fed Non - Fish Meal Diets. Unpublished M.Sc., Thesis, Animal Production Department, Faculty of Agriculture, Ain Shams University, 2017.

The present work was conducted in fish nutrition lab, Faculty of Fish Resources, Suez University, Suez, Egypt, to investigate the effect of fermented soybean meal on the growth, feed utilization, hematological blood parameters and histological section for liver and intestine of Nile tilapia *Oreochromis niloticus* .

Commercial soybean meal (44% CP) was fermented with *Bacillus subtilis* ATCC35854 using the solid-state fermentation technology. Bacteria fermentation increased the crude protein content of soybean meal by 6 % after solid-state fermentation the total amino acid of fermented soybean meal increased by 19.66% compared to soybean meal.

Five isonitrogenous (25% protein and isocaloric 4.4Kcal/g gross energy) practical diets were formulated as a replacement of fish meal by fermented soybean meal with *B.subtilis.* The first is the control diet which contained 15% fish meal. In the other three diets, fish meal was replaced by fermented soybean meal at levels of 33, 66 and 100%, respectively and the final diet contain 100% soybean meal without any treatment. Each diet was fed to three replicate groups of fish with an initial weight 10.±0.1 g for 98 days, represent the first experiment.

The best final body weight (BW), weight gain(WG), specific growth rate (SGR), protein efficiency ratio (PER) and protein productive value (PPV) were recorded by fish fed fish meal diet (control diet) followed by fish fed fish meal was replaced with fermented soybean meal at level of 33% (D-33FSBM).

Best approximate analysis for body protein and ash contents tended to be higher in control diet and (D-33FSBM). And lower in lipid content

compared to fish fed other diets. No significant different in Hematology blood parameters of fish fed different diets.

Morphological abnormalities in the distal intestine observed in fish fed SBM diet were moderately improved in fish fed control diet and (D-33FSBM) and were not observed in fish fed (D-66FSBM) and (D-100 FSBM diets. Morphological abnormalities in the liver of fish fed SBM diet were also improved in (D-33FSBM) diet groups.

In the second experiment five isonitrogenous (25% protein and isocaloric 4.4 Kcal/g gross energy) practical diets were formulated as fish meal free diets. The first contained 12% fish meal , the second diet fish meal was replaced with fermented soybean meal , the thired diet fish meal was replaced with fermented soybean meal and corn gluten, the fourth diet fish meal was replaced with fermented soybean meal and methionine , the fifth diet fish meal was replaced with fermented soybean meal, corn gluten and methionine. Each diet was fed to three replicate groups of fish with an initial weight 10.±0.1 g for 98 days.

The best final body weight (BW), weight gain (WG), specific growth rate (SGR), protein efficiency ratio (PER) and protein productive value (PPV) were recorded by fish fed fish meal diet (control diet) followed by fish fed mixed plant protein diet (FSBM+CG+M).

Best approximate analysis for body protein and ash contents tended to be higher in control diet and followed by fish fed mixed plant protein diet (FSBM+CG+M).. And lower in lipid content compared to fish fed other diets. No significant different in Hematology blood parameters of Nile tilapia fed different fish meal free diets.

Morphological abnormalities in the distal intestine observed in fish fed dish meal free diets were moderately improved in fish fed mixed plant protein diet (fermentend soyabean meal, corn gluten and methionine and were not observed in fish fed athor fiah meal free diets. Morphological abnormalities in the liver of fish fed fish meal free diet were also improved fish fed mixeid plant protein diet (fermentend soyabean meal , corn gluten and methionine.

These results indicate that fermentation of soybean meal under appropriate conditions is beneficial for preventing various physiological abnormalities that occur in Nile tilapia fed soybean meal. We conclude that properly fermented soybean meal is a promising ingredient as the main protein source in a non-fish meal diet for Nile tilapia.

Key words:- fish meal free diet - soybean meal – growth performance – *Oreochromis niloticus*.

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