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Housefly Maggot Meal (Magmeal): an Emerging Substitute of Fishmeal in Tilapia Diets

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Abstract

Several feed ingredients have been investigated in an attempt to substitute fishmeal in the fish and livestock diets. These include animal and plant protein sources. Unfortunately attempts to use these ingredients for complete replacement of the fishmeal component in tilapia diets have not entirely been successful. A major reason is the suboptimal content of essential amino acids in the diets especially methionine. Fish growth and feed utilisation are reported to be optimal with proteins of animal origin, mainly fishmeal characterised by being of high nutritive value. However, based on cost effectiveness, availability and crude protein content, housefly larvae seems to be a candidate for replacement of fishmeal in fish diets. In this study a multi-dimensional biological approach was used to evaluate the suitability of House fly Maggot meal as an alternative protein source for Tilapia *Oreochromis niloticus* fingerling. Growth parameters, protein utilisation, carcass composition, stress indicators and haematological parameters were examined. Seven test diets were formulated (Protein content 36 % dry matter; Gross energy 20 kJ/g). Dietary fishmeal concentration, decreased with increasing concentration of magmeal. Amino acid content of magmeal used seemed balanced though slightly lower than the fishmeal. However, it contained higher methionine content than the fishmeal. Fifteen fingerlings (initial weight 2.0±0.1g) were stocked per experimental tank. Experimental diets were fed in triplicates at 5 % body weight in two portions daily. Results show that no significant differences were observed between different feeding groups in terms of fish weight gain (11.25 — 15.08 g), Standard Growth Rate (3.45 — 3.76 % /day), and Food Conversion Ratio (1.05 — 1.22). The mean values for haematocrit, plasma cortisol and glucose were not significantly different ($p < 0.05$) among the feeding groups. This shows that no physiological stressful condition was introduced in the fish by feeding magmeal diets. The observation suggests that magmeal can completely replace fishmeal in the diet of Tilapia *Oreochromis niloticus* fingerling. Magmeal may therefore compare favourably with fish meal in terms of their amino acid profile and can conveniently meet the nutrient requirements of Tilapia *Oreochromis niloticus* fingerling.

Keywords: Alternative protein source, fishmeal, Housefly maggot meal, Tilapia