## ABSTRACT

In Sub-Saharan Africa, Nile tilapia (*Oreochromis niloticus* L.) make up over 80% of aquaculture production. However, the local aquaculture farmers are restricted by the unavailability and expensive cost of formulated rations. To reduce reliance on the scarce and expensive fishmeal used in fish feeds, alternative insect protein has been successfully utilized in many aquafeeds. However, data on the influence of insect-based feed on the growth and economic benefit of feeding tilapia with the emerging insect-based diet are scanty. This study investigated the effect of partially and completely substituting fishmeal with black soldier fly larval meal (BM) on growth and economic parameters of tilapia. The *O. niloticus* was fed a standard commercial diet as a control (100% FM; 0% BM), BM33 (67% FM; 33% BM), BM67 (33% FM; 67% BM) and BM100 (0% FM; 100% BM) for 20 weeks in randomly assigned cages mounted in an 800 $m^2$ earthen pond. Results from this study showed that diet type significantly ($p < 0.05$) affected the feed intake of the fish as well as weight gain. The feed conversion ratio and survival rate of *O. niloticus* did not vary across the different diets. Fish fed $Diet_1$ had a 15% increase in weight when compared to fish fed the control diet. Return on investment and the cost-benefit ratio was similar across the diets, suggesting that BM is a suitable and cost-equivalent dietary supplement of FM up to 100% in aquafeed for growing tilapia fish in earthen ponds for the market.



**Keywords:** Kenya; aquaculture; earthen pond; fishmeal; fortified aquafeed; insect meal.