

Research Article

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Growth Performance of *Clarias gariepinus* (Burchell, 1822) fed with Local Feed without Fish Meal

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Abstract In fish farming, feed accounts for a large proportion of production costs because of the use of fish meal and fish oil. The aim of this study was to develop a local feed from available local resources. To this end, a local feed balanced in essential amino acids and based on maggots (*Musca domestica*), earthworms (*Eisenia fetida*) and brewer's yeast as a total replacement for fishmeal was tested on *Clarias gariepinus* fry of average initial weight $P_{mi} = 4.39 \pm 0.01$ g for 90 days. Tested with three replicates, the feeds (control feed T0 - imported (*Gouessant*) and local feed T1) were used to feed fry distributed in tanks (volume 0.5m³ each) with a density of 100 individuals / tank. Results showed that no significant differences were found in final weight and weight gain ($p > 0.05$), whereas survival and protein intake differed significantly ($p < 0.05$) between T0 and T1. Feed utilisation parameters showed better utilisation of the T1 local feed, with a consumption index of 1.01 and a protein efficiency coefficient of 1.9. Economic analysis showed that local feed T1 was about half the cost of commercial feed T0. Nevertheless, further investigations are required to determine the impact of using this local feed on the organoleptic quality and reproductive capacity of the products obtained.

Keywords *Clarias gariepinus*; Total replacement; Local feed; Reproductive capacity

1 Introduction

Demographic pressure and rising global fish consumption have encouraged intensive, and often irresponsible, fishing. This overfishing has endangered many wild fish species. Biodiversity is also under serious threat from pollution of the natural environment and overfishing with prohibited gear, leading to the disappearance of certain aquatic species (Welly et al., 2020)

In this context, aquaculture, and in particular fish farming, appears to be the answer to reducing overfishing and satisfying the growing consumption of fish. In many African countries, like Guinea, aquaculture is being developed (FAO, 2024). Despite Guinea's considerable potential, fish farming is practised extensively, seasonally in ponds, puddles and reservoirs (MPAEM, 2015).

Furthermore, the development of aquaculture in Guinea is coming up against a number of problems, including a lack of high-performance feed on the local market at prices that fish farmers can afford. The main activity of rural Guinean populations is agriculture, which plays an unprecedented economic and social role (MPAEM, 2015).

In West Africa, maggots or black soldier fly (*Hermetia illucens*) and housefly (*Musca domestica*) larvae are increasingly used in fish feed (Djissou et al., 2020; Gangbazo Kpogue et al., 2024). Known for their high nutritional quality (protein and essential amino acid content in particular), maggot meal is increasingly used in the manufacture of fish feed because of its short production cycle and affordable price. Maggots are also biodegraders of organic waste, the management of which is a major environmental concern in Africa (Odjo et al., 2018).

The economic interest of aquaculture is highly dependent on the availability and cost of feed (Djissou et al., 2016). Reducing feed costs, and consequently controlling the production cost of farmed fish, is therefore one of the priorities in aquaculture (Djissou et al., 2020). In fact, fish meal is an essential and practically unavoidable