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Establishing a Special Open Field Test Appliance for Tree Shrews Evaluates their Stressed Locomotor Behavior

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Abstract

Objective: This research was performed to explore the timess of guanidinoacetic acid (GAA) supplementation of fish diets with variable energy contents on the growth performance and blood serum parameters of Nile tilapia fish.

Methodology: Nile tilapia Juveniles with an average weight of 20 g were cultured in glass aquaria and fed four formulated pelleted diets for 60 days. Our experiment was divided into four experimental groups: the first group (G1) was fed a basic control diet without any GAA supplementation. The other experimental groups, G2, G3 and G4, were fed diets with different levels of energy (25, 50 and 75 kcal/kg less than in the control, respectively) and supplemented with 0.06% GAA.

Results: The fish in G2 and G3 had significantly higher final body weights (FBWs) and body weight gains (BWGs) than those in the other experimental groups. In addition, the fish in G4 had significantly lower (BWGs) and protein efficiency ratio (PERs) than those in the other experimental groups. The serum levels of glucose and urea in G4 fish were significantly higher than those in fish in the other experimental groups. No significant differences in liver superoxide dismutase (SOD) or nitric oxide (NO) levels were observed among the experimental groups.

Conclusion: A reduction in digestible energy by up to 50 kcal / kg with supplementation of GAA at a level of 0.06% improved the growth performance of Nile tilapia fish.
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Introduction

Tilapia sometimes referred to as the "aquatic chicken" due to its rapid growth, adaptation to a broad spectrum of environmental circumstances and ability to grow and reproduce in captivity, is among the most promising species for aquaculture and has lower dietary energy requirements than other fish as it does not have to maintain a steady body temperature [1].

It has been reported that feed additives may be both nutritive and non-nutritive ingredients and work by either direct or indirect methods on the system. Feed additives are supplemented in small amounts (alone or in combination) for a specific purpose, such as to improve the quality of fish as a final product, to preserve the physical and chemical quality of the diet or to maintain the quality of theaquatic environment. There are diverse ranges of feed additives used in aquatic feeds. Some dditives are used in fish feed to preserve the nutritional characteristics of a diet or feed ingredients prior to feeding (e.g. antioxidant and mold inhibitors), enhance ingredient dispersion or feed pelleting (e.g. emulsifiers, stabilizers and binders), facilitate feed ingestion and consumer acceptance of the product (e.g. feed stimulants or attractants) and promote growth (e.g. growth promoters, including antibiotics, probiotics and hormones). Also, Enzymes also used to improve the availability of certain nutrients (e.g. proteases, amylases) or to eliminate the presence of certain antinutrients (e.g. phytase) [2-4].

Guanidinoacetic acid (GAA) is available commercially as a feed additive and is more effective than arginine (Arg) or creatine (Cre) as a supplement because of its lower price and higher chemical stability [5]. GAA is a naturally occurring compound synthesis in

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