

Abstract

The primary objective of this study was to evaluate the implications of substituting fish oil with sunflower oil, both with and without concurrent acetic acid supplementation, on the growth performance and lipid profile of GIFT Tilapia. This investigation encompassed various critical aspects, including growth performance, hematological parameters, lipid profiles, and liver health. The examination of initial and final weights of the tilapia fingerlings across distinct dietary groups revealed noteworthy improvements in all experimental groups, with the most substantial enhancements observed in the group subjected to both sunflower oil substitution and acetic acid supplementation. Several key growth-related parameters, including specific growth rate, percentage weight gain, feed conversion ratio, and feed efficiency ratio, exhibited notable variations among the dietary groups. Hematological parameters, such as hemoglobin, hematocrit, red blood cell counts, mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration, and white blood cell counts, exhibited significant disparities among the groups, with particular sensitivity to the effects of sunflower oil substitution and acetic acid supplementation. Furthermore, the analysis of lipid profiles uncovered marked distinctions, with the group receiving sunflower oil and acetic acid supplementation consistently demonstrating the lowest values in cholesterol, LDL, triglycerides, VLDL, and HDL. Notably, liver health parameters, specifically alkaline phosphatase and aspartate aminotransferase, displayed significant variances, thus highlighting the discernible influence of dietary interventions on liver function. These findings collectively underscore the intricate relationship between dietary composition and the ensuing physiological responses in GIFT Tilapia, thereby providing valuable insights into the optimization of aquafeed formulations for the promotion of sustainable aquaculture practices.