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Study on the Inclusion of Black Soldier Fly Larvae (BSFL) in Feeding Regimen of Catfish (*Pangasius* sp.) Fingerlings

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Structured Abstract

Background: The aquaculture industry is expanding rapidly due to increasing global demand for fish protein. However, the industry faces sustainability and cost challenges, with feed accounting for over 60% of production costs. Conventional ingredients like fishmeal and fish oil are unsustainable due to overfishing and rising costs. This study explores the use of black soldier fly larvae (BSFL) as an alternative, sustainable, and economical feed ingredient to enhance the growth and health of Pangasius sp. fingerlings.

Methods: BSFL was incorporated into aquafeeds at 20% levels. Two different pellets of fermentation were done; inclusion of BSFL before fermentation and inclusion of BSFL after fermentation of substrate. Commercial pellet was used as the positive control. Proximate analysis of feed pellets was conducted to know the nutrients content. A total period of two weeks was spent to feed the fishes with the pellets. Growth performance and feed conversion ratio (FCR) were monitored over the study period. Polyunsaturated fatty acid (PUFA) content in catfish flesh was analysed using Gas Chromatography-Mass Spectrometry (GC-MS).

Results: Diets incorporating BSFL enhanced growth performance, improved FCR, and increased PUFA levels in fish flesh. Fish fed with both fermented and unfermented BSFL pellets exhibited improved growth performance compared to those fed with commercial pellets. Although the differences were not statistically significant, the FCR proved a better result when fed with BSFL incorporated pellets. After the two weeks of the feeding regimen, oleic acid, arachidonic acid and other beneficial fatty acids were observed. Fish fed with pellet incorporated fermented BSFL showed the highest and a significant increase in PUFA content, suggesting the potential of BSFL as a superior aquafeed ingredient.

Conclusion: Incorporating BSFL into aquafeeds demonstrates significant promise in addressing sustainability challenges by offering a cost-effective solution that supports the growth and health of cultured fish. This study contributes to advancing aquaculture practices and reducing dependency on costly feed ingredients.

Keywords: Turmeric, medicinal properties, volatile compound, optimization

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