

**EFFECT OF DIFFERENT STOCKING DENSITIES AND CARBON SOURCES ON WATER QUALITY AND PRODUCTION PERFORMANCES OF TILAPIA**

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Aim of this study was to examine the effect of biofloc systems supplied with different carbon sources on water quality and growth performances of genetically improved farmed tilapia (GIFT) fingerlings cultured in different stocking densities. Treatments were arranged in a two-factor factorial experiment with three carbon sources; wheat flour (WF), molasses (MOL), a mix of WF-MOL and a control (without carbon addition). Four stocking densities; 40, 50, 60 and 70 m<sup>-3</sup> were set as the second factor. Fingerlings were stocked with a mean body weight of 2.4 ± 0.4 g in 32 tanks. Water quality parameters, body weight and length were measured and specific growth rate (SGR), weight gain (WG), and mortality were calculated. The interaction effect of carbon sources and fish density was not significant ( $p > 0.05$ ) on water quality parameters and growth parameters of fish (except body length). The pH (6.77 ± 0.04) and floc volume (7.44 ± 1.05 mL<sup>-1</sup>) was significantly higher ( $p < 0.05$ ) and total ammonia nitrogen (0.45 ± 0.18 mgL<sup>-1</sup>) was lower in MOL compared to the other treatments. However, dissolved oxygen was significantly higher ( $p < 0.05$ ) in control compared to others. The body weight and length, SGR, and WG were significantly higher ( $p < 0.05$ ) in fish reared with carbon sources compared to the control while no differences were observed among the carbon sources. Further, body weight of tilapia was significantly higher ( $p < 0.05$ ) in 40 m<sup>-3</sup> and 50 m<sup>-3</sup> (27.61 ± 2.98 to 28.04 ± 2.98 g) densities compared to other two densities. Further, pH was significantly affected ( $p < 0.05$ ) by different fish densities. The addition of wheat flour resulted in significantly higher ( $p < 0.05$ ) mortality (19.40%) of tilapia compared to that of the other treatments. In conclusion, the addition of MOL with 40 - 50 m<sup>-3</sup> fish densities, positively affect on growth parameters, while maintaining better water quality and higher survival rates in the GIFT tilapia.

**Keywords:** Biofloc, Carbon sources, GIFT tilapia, Growth, Water quality