

**INCORPORATION OF AQUAPONICS IN POULTRY-FISH
INTEGRATION: A FEASIBILITY STUDY**

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Although aquaponic is considered as a sustainable method, which integrates nutrient-rich effluent for plant growth, studies are scanty. This study focused to evaluate the possibility of utilizing poultry-fish integration for aquaponics, based on the performances of tomato (*Lycopersicon esculentum*) plants. The experiment was conducted in a Completely Randomized Design with four treatments and four replicates. Performance of coupled (CDWCA), decoupled (DDWCA) deep water culture aquaponics, conventional farming (CF), and hydroponics (HS) were compared for eleven weeks. Aquaponic systems were configured to have the same pond water. The pond (50 m x 20 m x 1.5 m) comprised of breeding stock of tilapia and carp at a density of 10 fish per m³, integrated with poultry. Fish and poultry fed *ad-libitum*, 3 times per day with commercial diets having 28% and 16% crude protein, respectively. Growth of plant was measured weekly, in terms of plant height, girth, leaf number, leaf length, and leaf width. DDWCA showed significantly higher ($p < 0.05$) plant height and leaf length (103.65 ± 6.18 cm, 26.02 ± 1.89 cm) than the CF (37.82 ± 6.18 cm, 17.35 ± 1.89 cm). Hydroponic system showed significantly higher ($p < 0.05$) leaf number, leaf width, leaf length, and plant height (71.5 ± 4.74 , 33.4 ± 1.79 cm, 43.65 ± 1.89 cm and 184.75 ± 6.18 cm) than the CDWCA (45.75 ± 4.74 , 8.92 ± 1.79 cm, 16.45 ± 1.89 and 37.37 ± 6.18 cm) and DDWCA (19.5 ± 4.74 , 15.27 ± 1.79 cm, 6.02 ± 1.89 cm and 103.65 ± 6.18 cm), respectively. Overall, the hydroponic system performed better. Further investigations are required to evaluate the reproductive, yield, and quality parameters of different horticultural crops.

Keywords: Conventional farming, Deep water culture aquaponics, Hydroponic, *Lycopersicon esculentum*