MULTI-LEVEL FARMING SYSTEM FOR TILAPIA *(Oreochromis niloticus)*, RABBIT *(Oryctolagus cuniculus)*, AND LETTUCE *(Lactuca sativa)* UNDER A GREENHOUSE

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ABSTRACT

MAG-ISA, CAMILLE D. and **GARCIA JOHN MCLEAN Q.**, Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, **JUNE 2023**, **MULTI-LEVEL FARMING SYSTEM FOR TILAPIA (*Oreochromis niloticus*), RABBIT (*Oryctolagus cuniculus*), AND LETTUCE (*Lactuca sativa*) UNDER A GREENHOUSE**

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To investigate the growth and yield of lettuce (*Lactuca sativa*) using Nile Tilapia (*Oreochromis niloticus*) culture with a percentage of rabbit dung in their feeds, a controlled environment greenhouse was equipped with three recirculating aquaponics systems, each replicated three times. Within the systems, water was lifted from an 800L IBC Tank to Hydroponics NFT System using 60-watt submersible pump. The water depth maintained at 800 Liter and hydroponically germinated lettuce seedlings planted on a sponge after 30 days of stocking 50 Nile Tilapia per IBC tank. Throughout the study, the environmental conditions and water quality parameter were carefully monitored. After 90 days, data were collected for lettuce, tilapia and rabbit. The results indicated that the systems maintained an average dissolved oxygen of 3.26-3.94 ppm. The pH level ranged from 7.87-8.01, promoting the retarded growth of tilapia and lettuce. Despite a low total TDS level less than 260 ppm, which was below the required threshold, the elevated pH hindered the growth of the lettuce. Among the three treatments, Treatment 3 (100% Commercial Feeds) demonstrated the highest growth and success in Nile Tilapia culture. Treatment 2 (20% rabbit dung, 80% Commercial feeds) performed best in terms of weight of lettuce and number of leaves in the multi-level system. In vertical tower, Treatment 2 demonstrated

the highest weight and length of leaves. In comparison for the lettuce in the multi-level system compared to the lettuce in vertical tower, the vertical tower showed higher weight, number of leaves and length of leaves.

Keywords: aquaponics; hydroponics; multi-level system

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