INFLUENCE OF LOCAL CLIMATE AND DIETARY PROTEIN LEVEL ON GROWTH AND FEED PERFORMANCE OF NILE TILAPIA UNDER INTEGRATED BIOFLOC AND AQUAPONIC CONDITIONS

By

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ABSTRACT

The current experiment was designed to test the effect of crude protein content (25, 30 and 35% C.P.) as well as restricted feeding in biofloc culture on growth performance of Nile tilapia (*Oreochromis niloticus*), and water quality dynamics and aquaponic production of lettuce plants (red leaves lettuce). Starting with average initial weights of 13.5 to 20.3 grams/fish, Nile tilapia juveniles grew to harvest weight of 310.2 to 342.1 grams/fish. Increasing dietary protein from 30% to 35% within the biofloc treatments did not improve final body weight at harvest. It is recommended to feed Nile tilapia at crude protein level 30% in order to obtain acceptable growth with economic returns. Among the dietary treatments, Nile tilapia had higher FCR with the 25% crude protein treatment (2.23:1) compared to all FCR values obtained by other treatments (1.51 - 1.87). The deterioration in feed conversion ratios in 25% crude protein treatment was due to the slightly slow growth rate of Nile tilapia which was negatively affected by lower protein content. The results of the current study demonstrated that when Juveniles of Nile tilapia were reared in the biofloc tanks, the amount of daily feed inputs can be reduced without affecting the production costs. Aquaponic production of plants included three cycles lettuce production during fall, winter and 2nd summer. The duration of lettuce culture lasted for 30 day during each season. The total yield of fresh weight per plant ranged 13.3-21.6 grams/plant during summer season, being lower than those of fall season which increased to 60.3-83 grams/plant during fall season. The total yield of fresh weight per plant greatly increased to 181.4-234.8 grams/plant during winter season since red leave lettuce is a winter crop. The sales revenue of red leave lettuce plant per tank (raft) ranged 69-75L.E. and 72-75L.E. during fall and winter seasons, respectively. Since fish production per tank averaged 154L.E. during the current study, the market value for lettuce production is nearly equal to that of fish production.

Keywords: Nile tilapia, crude protein, restricted feeding, Aquaponic, Biofloc technology, Water Quality, urban innovative agriculture, smart sustainability, Soilless culture, local Climate, Red leaf Lettuce.

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ARABIC SUMMARY