Is fish quality healthier in aquaponics?

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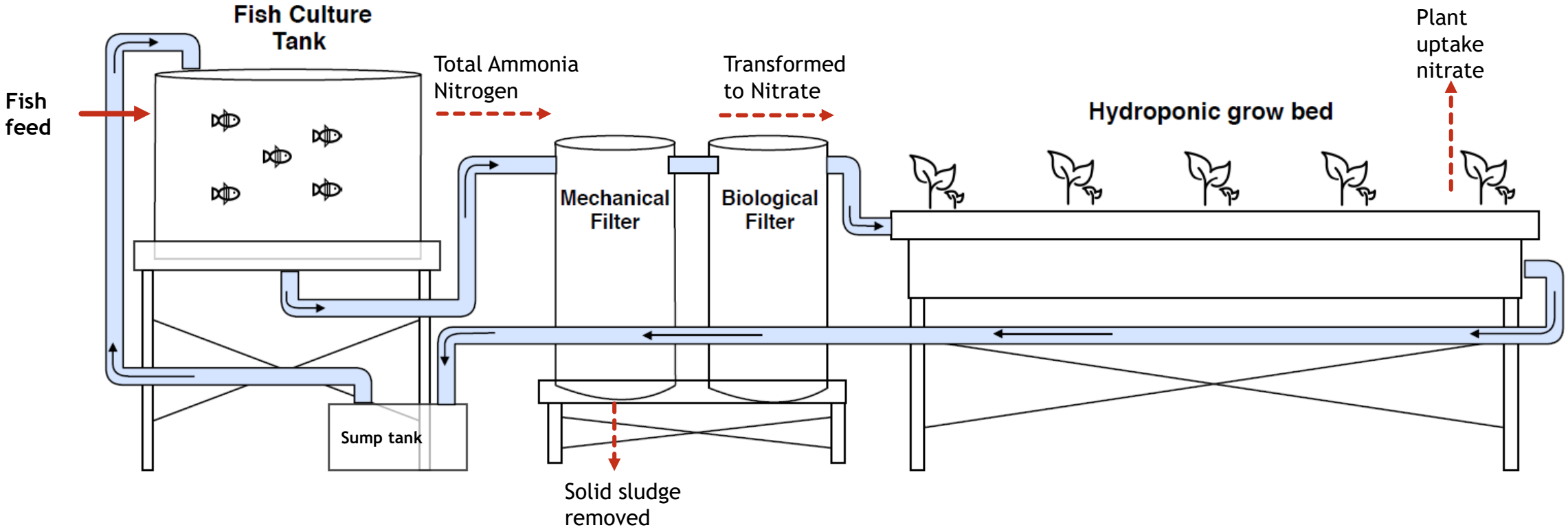
Introduction

- Aquaponics is a food production system which Integrates recirculating fish farming with hydroponic vegetables.
- Value-added products can be produced while lowering nutrients pollution into watersheds.
- It is a holistic approach to raise fish and vegetables together in a cost-effective way which can works well especially for marginal farmers.

Goal and Objective

The goal of our research was to determine the food quality of fish produced in aquaponics system that are **healthy** and **nutritionally enriched** as compared to conventional aquaculture fish available in the markets. Specific objectives are to analyze for:

Materials and Methods



Ref. Natalia Zappernick, (MS student), FABE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Fish and lettuce

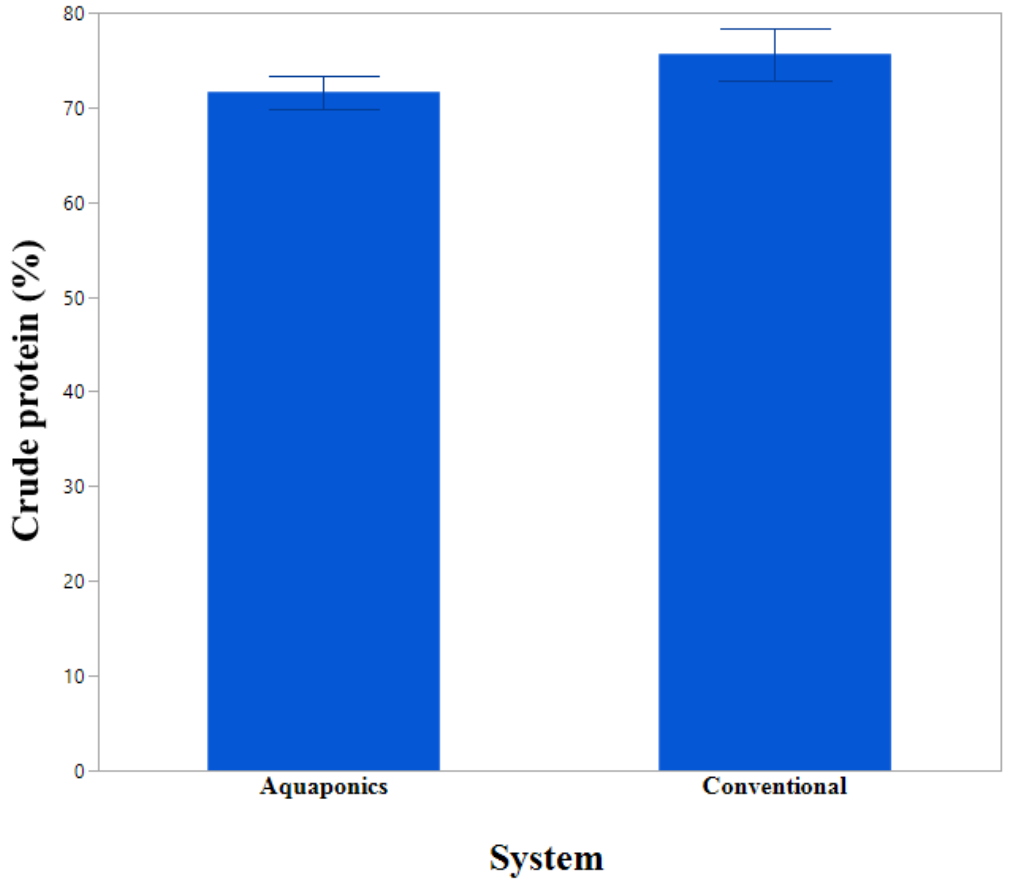
- Tilapia (*Oreochromis niloticus)* fish were reared in 1 m^3 tank in aquaponics system, 60 fish in each tank with three replications.
- Lettuce has grown on floating hydroponic bed (3 m x 1.5 m wide x 0.15 m deep)
- Commercial pelleted feeding @ 3% body weight
- Water recirculation (250 %)

Fish processing and analysis

- **Amino acids profiling**: Dried fish samples were hydrolyzed in 6M HCl at 110°C for 24 h. Excess acid was removed from the hydrolysate by flash evaporation and analysis was carried out using cation-exchange chromatography (AOAC, 1984).
- **Fatty acids composition**: Lipids were extracted by using chloroform/ methanol (2 : 1, v/v) and analyzed with gas chromatography mass spectrometry.
- **Mineral analysis**: Finely-grounded oven-dried fish samples were digested with 5 ml conc. HNO_3 and 2 ml H_2O_2 using the Anton Parr microwave digestion. The digestate was diluted with dH_2O, centrifuged, and filtered to obtain clear aliquot. The aliquots were analyzed using Inductively Coupled Plasma Emission Spectrophotometry.

Results and Discussion

Fig. 1: Average ***protein content*** of Aquaponics and Conventional Aquaculture fish **(p>0.25)**



Conclusions

- Protein and lipid contents of Aquaponics fish were comparable to those of conventional aquaculture fish.
- However, percent docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) contents significantly exceeded in Aquaponics fish.
- Both macro- and microelements density of aquaponics fish showed a good mineral source.
- Overall, tilapia fish quality produced in aquaponics system is **heathier** than that of the imported fishes.

Thank You