Design and testing of an aquaponics (fish/hydroponic plant) production system for use in a hot arid environment

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Aquaponics is the combination of fish production (aquaculture) with the soil-less production of plants (hydroponics). It operates within a closed-loop system and utilizes minimal resources. Fish feed provides most of the nutrients required for healthy plant growth. These nutrients, excreted directly by the fish, or generated by the microbial breakdown of organic wastes, are absorbed by growing plants. Nutrient removal by the plants in turn treats the water by removing nitrogenous compounds, such as dissolved ammonia, which are harmful to fish. Water is then re-oxygenated and returned to the fish tanks. Fresh, potable water is added to the system, as necessary to replace evaporative loss. In 2010, a report was published by a group of scientists from Sultan Qaboos University and the Ministry of Agriculture and Fisheries Wealth for the combined production of tomatoes and red hybrid tilapia. This research had support from the Agricultural and Fisheries Development Fund (MoAFW). Various types of salad crops have been grow with Nile tilipa in aquaponics system in climate-controlled greenhouse. This paper describes the testing of an aquaponics system using floating rafts. In this system the plants are grown in small coir pots and receive their necessary minerals from the fish tank via the water which circulates around their exposed roots beneath floating Styrofoam rafts. This paper reports the productivity of fish and plant crops, measures of the release and uptake of minerals and the results of microbial tests on produce.

Biography

Fatma Al-Abri received her BSc degree in Marine Science and Fisheries from Sultan Qaboos University in May 2004, Oman. She has worked as an Assistant Researcher at the Center of Excellence in Marine Biotechnology - Sultan Qaboos University since December 2011. She is highly involved in research interest with aquaculture and aquaponics. She had served as Specialist Fish Wealth Development at Ministry of Agriculture & Fisheries Before joining SQU, from 2009 to 2011. She has attended several national and international conference, symposiums, trainings and organized national workshops and conference.