

A Study on Malaysian Sewage Treatment Plant Effluent Application in Aquaponics System

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Abstract — An estimate of the amount of effluent produced from sewerage treatment plants around Malaysia run into millions of litres per day and these usually go unused, ending up in surrounding natural water bodies. The study presented in this paper was conducted to assess the feasibility of using locally produced sewerage treatment plant effluent in an aquaponics environment. The effluent used in this study came from two sewerage treatment plants that conform to Standard B of the Environmental Quality (Sewage) Regulations 2009. The aquaponics system used was a media bed unit with tilapia fishes and winged beans as the aquatic organism and vegetation, respectively. This study contained three parts where in the first part, the characteristics of the sewerage treatment plant effluent were established. In the second part, effluent was added into the aquaponics system biweekly while in the third part effluent was added daily. At the end of the third part, the fish and plant samples were tested for heavy metals. The results showed that after 14 weeks of minimal exposure continued by daily infusion of sewerage treatment plant effluent, the tilapia fishes and winged beans samples tested were within the heavy metal limits established in the Fourteenth Schedule of the Malaysian Food Regulations 1985. This shows that using sewerage treatment plant effluent in aquaponics systems is a viable method of producing food, though similar studies with longer duration and from different aspects are still needed to fully establish the safety of the food produced from these types of systems.

Keywords: *Aquaponics, Heavy metals, Sewage effluent, Tilapia, Winged beans.*