

## **Requirements for inserting intercropping in aquaponics system for sustainability in agricultural production system**

### **ABSTRACT**

In recent years, the recirculating aquaponics system has gained high attention and significant popularity for organic vegetables and fruits production which contributes to the sustainable aquaculture for tropical regions. This review aims to summarize the possibility for practicing intercropping in aquaponics to produce high-quality fruits, vegetables and fish without any chemical fertilizer and minimum ecological impact for a sustainable agriculture. Although many studies have addressed about aquaponics for producing high-value crops such as tomato, cucumber, and lettuce, there is still a lack of complete information to support the development of intercropping in aquaponics and limited focus on its commercial implementation. Moreover, this study will focus first on the requirements for inserting intercropping in aquaponics and technical improvements needed to adapt as potential for sustainable food production system to increase productivity around the world, especially in countries have deficiency in water and land resources as well as soil problem like salinity and reduce environmental emissions. Secondly, the insertion of intercropping in aquaponics must be for crops with high value and for crops that can complement together such as tomato with basil and tomato with lettuce. Thirdly, in technical improvement in this study will summarize the strategies and factors that affect the intercropping in aquaponics system such as the nutrients needed for crops under intercropping aquaponics, stocking density and feeding rate which are important to know the concentration of ammonia that is produced and converted to nitrate so that the plants can uptake it. Studying the requirements for inserting and improving intercropping in aquaponics will increase our understanding of needed for new agriculture technique that contributes to the sustainable aquaponics for tropical regions.

**Keyword:** Intercropping; Aquaponics; Feeding rate; Feeding frequency; High crop value