

LEARNING AQUAPONICS POST COVID-19 THROUGH START-UP INDUSTRY PARTNERSHIPS

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PROBLEM

Pre-COVID-19 lockdowns (2019), we usually organise for our students to visit a commercial aquaponics facility, [Green Camel](https://greencamel.com.au/)¹, which is a start-up company located within The University of Sydney's Cobbytt campus. Green Camel produces both barramundi (fish) and pesticide-free organic vegetables, such as tomatoes and basil. Effluent from the barramundi is passed through a bioreactor which converts ammonium to nitrate, which is then utilised by the vegetables in a closed-loop system. During the COVID-19 pandemic (2020-21), we had to live-stream and video field visits to remotely located students and international students who are unable to travel to Australia to experience the field visits. We were not very happy with video recording field practicals, since the students did not get a hands-on experience with aquaponics.

PLAN

After the lifting of the COVID-19 restrictions, the first author partnered with start-up company, [Farmwall](https://farmwall.com/)², in its STEM Pilot Program. In this Program, Farmwall provided students with an aquaponic ecosystem classroom kit including a fish tank, plant trays, plants, seeds, gravel and micro-organisms for converting ammonium to nitrate, as well as a separate hydroponics kit. An online education platform was also provided with detailed instructions for setting up the aquaponics kit, as well as step by step video instructions on how to maintain the fish tank and grow the vegetables including microgreens. Teachers and students were able to engage with the step-by-step process of setting up the aquaponics system as well as monitoring the health of the system (e.g., pH, ammonium, nitrate and nitrite levels).

ACTION

Farmwall provided the students with an aquaponic classroom kit so that they can engage in setting up and maintaining a model aquaponics unit. One of the students also contributed biological filtration, white cloud mountain minnows (*Tanichthys micagemmae*; fish) and aquatic plants. During the lab practicals, students harvested and tasted the snow pea microgreens grown using the aquaponic classroom unit. Some students were also inspired to convert their home fish tanks into home mini-aquaponic systems.

REFLECTION

In addition to visiting or watching videos of field visits, students learnt to set up and maintain an aquaponics unit to produce vegetables such as microgreens, which is a life skill that they can use in the post-COVID-19 world. Live-streamed and in person practicals provided useful information on how students could set up and produce vegetables including microgreens, becoming potentially self-sufficient. In addition to learning the theory of aquaponic production, students gained the life skills of a close-loop system to produce their own organic vegetables at home.

¹<https://greencamel.com.au/>

²<https://farmwall.com/>