

SCALEUPCATALYST

CASE STUDY: FOULING DOCTORS PPB

The Fouling Doctors has developed an automated cleaning device for large onshore and offshore aquaculture farms.



CLEANING UP AQUACULTURES BIG PROBLEM

Dr Tim Hülsen holds a PhD in environmental biotechnology and during his time at the University of Queensland (UQ) developed a device to address the challenge of biofilm 'fouling' of submerged surfaces in round tanks, which is a common problem in aquaculture systems.

Cleaning in aquaculture systems is normally only undertaken when there is a significant biofilm load because of the high cost and time commitment of the task. This leads to further problems including: release of organisms which leads to re-colonisation and spread of biofouling species and pathogens; damage to surfaces, nets and coatings; and water quality and fish health issues related to the release of large amounts of biomass.

RESEARCHER TO FOUNDER

Tim had validated the need for his solution through an earlier pre-accelerator program, so he sought and was granted an assignment of the rights to the technology from the University. This enabled him to file a patent to protect the invention and establish the Fouling Doctors company to pursue the opportunity on a full-time basis. Whilst Tim had every confidence in the solution, he quickly recognised the need to engage directly with commercial and research customers in the aquaculture industry to conduct demonstration trials and get feedback from the end-users.

A prototype trial conducted over three weeks in a 30,000L tank at Hervey Bay has clearly demonstrated the efficacy of the Fouling Doctors technology in removing the need for manual cleaning of tank walls and floors. Whilst further trials are underway to further refine the system, the success of the initial demonstration has resonated with potential partners and customers globally. Tim is pursuing a commercial relationship with an Australian company to manufacture and distribute the technology to the aquaculture industry in the first instance, and then provide the on-going support to the customers and end-users.

A FISHY PROBLEM

The Fouling Doctors cleaning solution was adapted from a design originally developed at UQ to harvest Purple Phototrophic Bacteria (PPB) from photobioreactors as part of Tim's research. PPB are an emerging alternative protein source that have been shown to substitute fishmeal in various aquaculture species.

During the Scaleup Catalyst program, Tim applied the business principals he had learned to the opportunity presented by PPB as an aquaculture feed. Through this analysis he identified the rapid development of the alternative protein sector from a niche product to a mainstream phenomenon, with a forecast compound annual growth rate (CAGR) of 18% between 2022 and 2032.



"With the help of the Food Futures team I established a new network and learnt how to grow my business. The continued coaching remains extremely helpful to guide me on my journey."

Dr Tim Hülsen
Founder, Fouling Doctors



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Food Futures Company Scale Up Catalyst Program



KEY RESULTS

- ✓ Tim has built relationships with global customers and supply chain partners for both the Fouling Doctors and PPB.
- ✓ Fouling Doctors is establishing a commercial relationship with an Australian company to manufacture and distribute the technology in the aquaculture industry.
- ✓ Through the aquaculture industry engagement, a new market opportunity in water storage tanks has recently emerged and is being explored with a commercial provider in this sector.
- ✓ A commercial relationship has been established with a global aquaculture feed company to develop and trial PPB feed formulations.
- ✓ Finalising pre-seed investment and completing commercial trials



“During the program pathway, I learnt how to validate my business ideas and how to develop suitable business models and go-to-market strategies... Food Futures’ unwavering support and expert guidance have played a pivotal role in our business growth.”

A FISHY PROBLEM

The growth of global aquaculture production and consumption is expected to increase demand for protein-rich fish meal to an estimated 192,000 tonnes per day. However, the supply of harvested fish for fishmeal has drastically reduced in recent years amid unsustainable pressure on wild caught resources, resulting in a doubling of fishmeal price since 2020. Current systems cannot meet the demand and emerging alternatives are proving too costly to be a viable alternative.

PPB are characterised by a high protein content, a range of important nutritional compounds such as carotenoids and bacteriochlorophylls, and compounds with immune-modulating effects. This nutritional profile coupled with low production costs represents an opportunity for PPB to address the fishmeal supply issues that constrain the aquaculture market, which is worth over \$1 billion in Australia and more than US\$280 billion globally.

As a further advantage, PPB production can utilise nutrient rich wastewater streams from food processing as a substrate. Valorisation of these waste streams represents a value proposition for food processors and supports the sustainability credentials of the aquaculture supply chain.

A commercial relationship has been established with a global aquafeed company to develop and trial PPB- based feed formulations – with an option for an offtake agreement for commercial feed. This commercial relationship and path to end-product provides a strong investment case and pre-seed investment is being finalised to support the construction of a pilot facility to produce PPB for these trials.

TAKING IT TO THE WORLD

Tim attended the world’s largest aquaculture technology exhibition, Aqua Nor, in Norway in August 2023 and validated that the aquaculture industry challenges solved by both Fouling Doctors and PPB are global problems. He has established new relationships with potential global supply chain partners and customers and will continue to keep them engaged with the development of both solutions in Australia, to provide the commercial pathway to the global aquaculture industry.

Scaling Australia’s agrifood innovation businesses for global growth

Our goal is to help startups grow and succeed. The Food Futures Scale Up Catalyst™ incubator supports agrifood tech and innovation startups from across the value chain who are looking to create positive IMPACT on the agrifood system and to scale their ventures globally.