AQUA EXCEL 3.0

AQUAculture infrastructures for EXCELlence in European fish research 3.0

On The Horizon

EATiP Aquaculture Project Dissemination Service

AQUAWASTE: Improving Plant Health Through Nutrient Remineralization in Aquaponic Systems

On The Horizon Online Webinar – 12 May 2022

Victor Lobanov, University of Gothenburg

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KNOWLEDGE NEED

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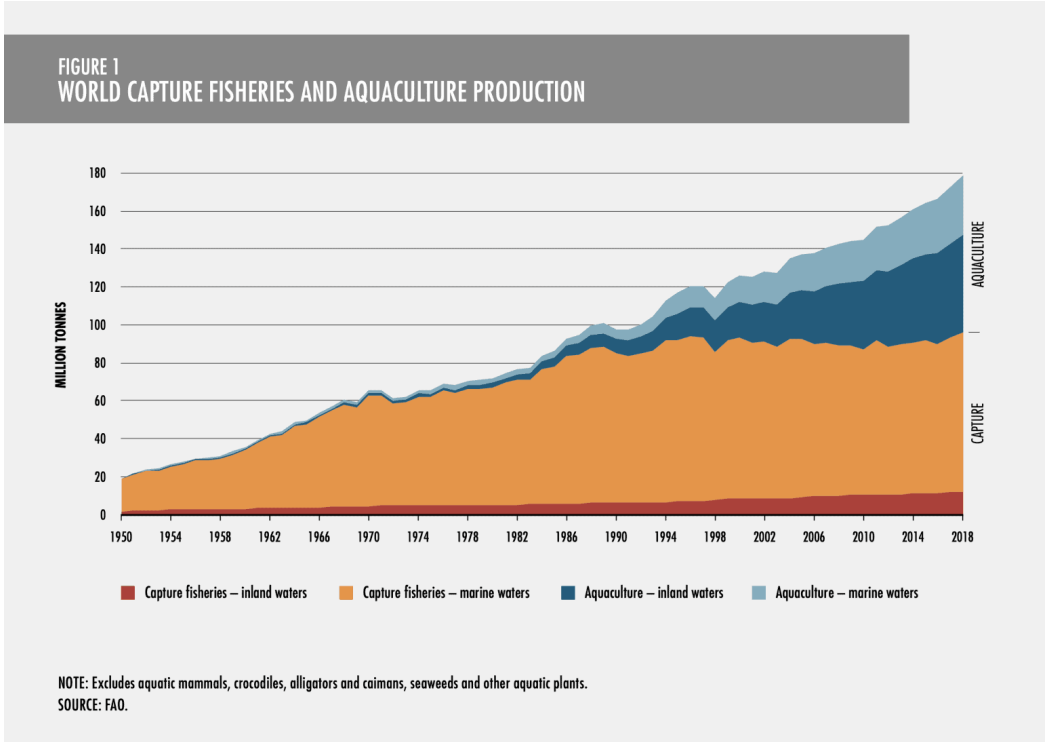
Aquaculture waste as a growing issue:

- Rich in carbon and nitrogen
- High in energy
  - Context: Norway produces 1.3 million tons of salmon annually, consuming 1.5 million tons of feed.
  - Equivalent energy yield = 12 million GJ; enough to supply 150,000 homes per year with electricity!
- Highly dilute, difficult to contain
- Currently little to no incentives for treatment



Growth in the aquaculture field is both a challenge and opportunity for waste revalorization.

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SOLUTION

Common solutions involve large settling basins, or otherwise require expensive infrastructure.

Goal here = inexpensive, efficient solution that could financially incentivize waste treatment.

Solution: AquaWaste

Improving Plant Health Through Nutrient Remineralization in Aquaponic Systems

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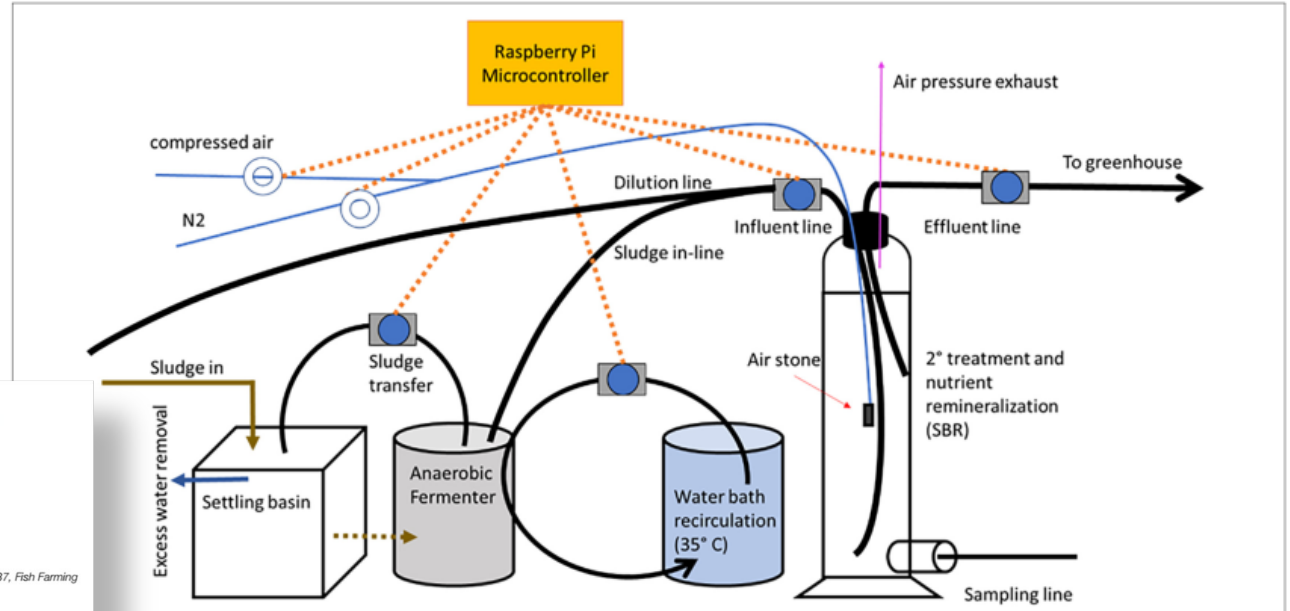

FIGURE 2 | An overview of the solid waste treatment system.

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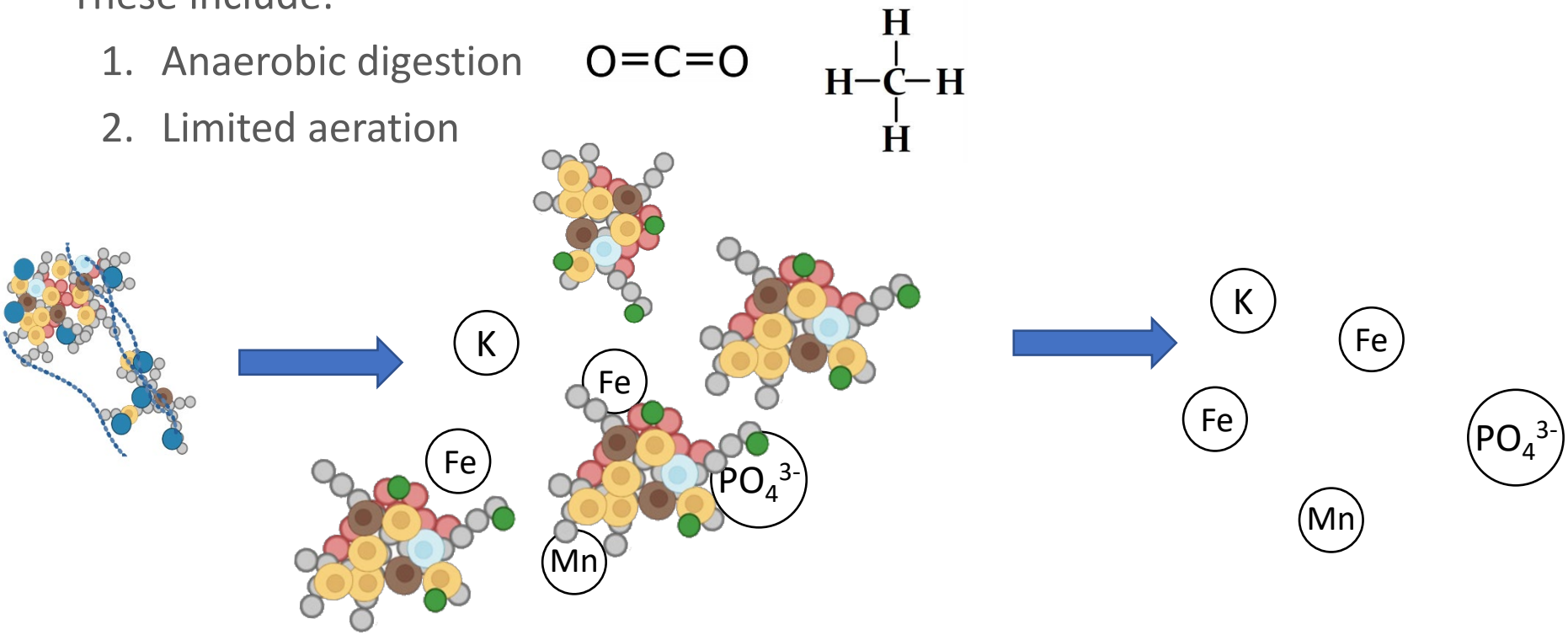
UNDERLYING MAGIC

- By creating unique compartments for the microbial communities, multiple waste breakdown phases are able to be combined in close proximity.
- These include:
  1. Anaerobic digestion
  2. Limited aeration



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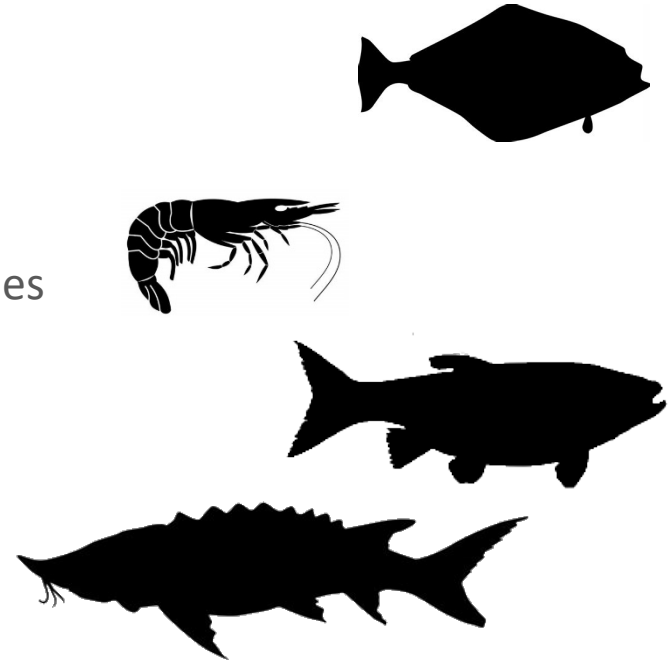
TARGET MARKET

- Global aquaculture market size = $285,359.7 million in 2019; 2027 projection = $378,005.5 million (Coppola et al., 2021)
- Main targets:
  - Recirculating Aquaculture System (RAS) facilities
  - Closed containment aquaculture facilities
  - Aquaponic facilities
  - Land-based concentrated animal husbandry facilities
- Function:
  - Economically profitable waste revalorization



Coppola D, Lauritano C, Palma Esposito F, Riccio G, Rizzo C, de Pascale D. Fish waste: from problem to valuable resource. Marine Drugs. 2021 Feb;19(2):116.

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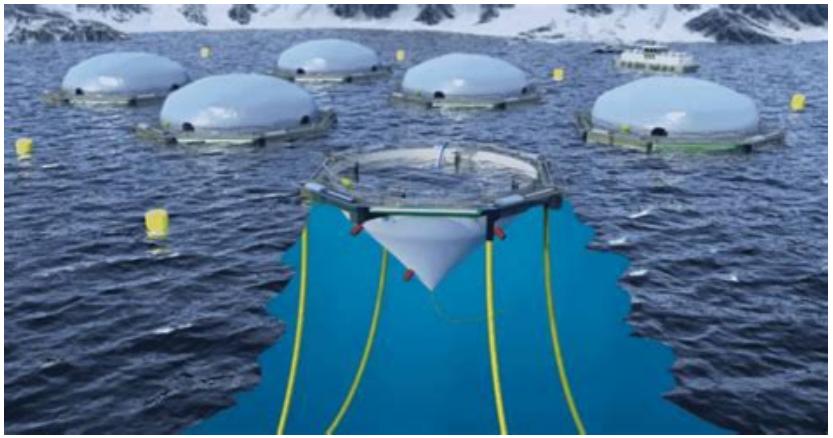
RESULTS and IMPACT

- Preliminary results indicate that remineralized nutrients are more bioavailable than hydroponic nutrients
- Ongoing follow-up research suggests that:
  - Solids treatment systems have the potential to efficiently produce methane when certain cultivation modifications are made to standard waste treatment processes
  - Process is adaptable to saltwater conditions

https://www.sfa.gov.sg/food-for-thought/article/detail/closed-containment-systems-an-answer-to-rising-eco-threats-30-by-30-goal



https://thefishsite.com/articles/a-fresh-take-on-closed-containment-aquaculture

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CURRENT STATUS

- Patent application in progress
- TRL 4 – technology validated in lab
- Five company contacts wish to implement the system at their facility, will commence summer 2022 (pilot stage)
- Need to package into an implementable product in order to be market-ready

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Thank you!

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