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NTU Singapore and Temasek Polytechnic scientists replace fishmeal in aquaculture with microbial protein

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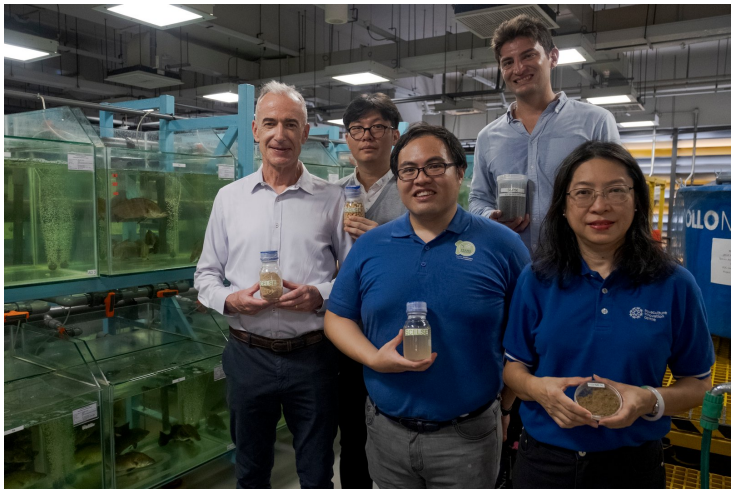

Single cell protein derived from soybean processing wastewater is a sustainable alternative

Scientists from **Nanyang Technological University, Singapore (NTU Singapore)** and **Temasek Polytechnic** have successfully replaced half of the fishmeal protein in the diets of farmed Asian seabass with a â??single cell proteinâ?? cultivated from microbes in soybean processing wastewater, paving the way for more sustainable fish farming practices.

The use of a cultivated protein is new to aquaculture production, say the scientists from the **Singapore Centre for Environmental Life Sciences Engineering (SCELSE)** leading NTUâ??s efforts in the study, and **Temasek Polytechnicâ??s Aquaculture Innovation Centre (AIC)**.

Farmed aquaculture species rely heavily on feed made from wild-caught fish, known as fishmeal, which is not sustainable and contributes to overfishing of the seas.

Single cell protein, a sustainable alternative, can be cultivated from food processing wastewater. In particular, the wastewater from soybean processing contains organisms with probiotic potential that are essential for healthy fish growth.

Wastewaters from the food-processing industry are free of pathogens and other contaminants, make them suitable for growing microbes. Normally after processing the wastewater is discharged and flows into a wastewater reclamation plant. Its nutrients are not recovered, resulting in a lost opportunity to maximise resource use.

Co-lead author of the study, Dr Ezequiel Santillan, senior research fellow at SCELSE,said, â??Our study represents a significant step forward in sustainable aquaculture practices. By harnessing microbial communities from soybean processing wastewater, we have demonstrated the feasibility of producing single cell protein as a viable alternative protein replacement in fish feed, reducing the reliance on fishmeal and contributing to the sustainability of the aquaculture industry.â?

The joint research team said that their waste-to-resource approach tackles food security and waste reduction, supporting the development of a circular economy with zero waste as outlined in the United Nations Paris Agreement.