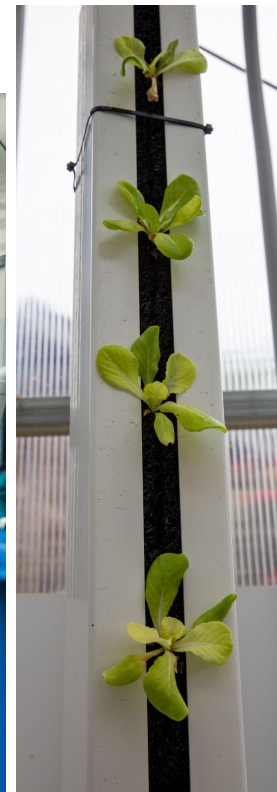


UCSC Aquaculture Greenhouse: ocean-friendly fish feeds, integrated aquaculture-agriculture



Funding: UC Santa Cruz, Webster Family Foundation, Vranos Family Fund, USDA, NOAA, CA Sea Grant

[HTTPS://KAPSAR.SITES.UCSC.EDU](https://kapsar.sites.ucsc.edu)

KAPUSCINSKI-SARKER
ECOLOGICAL AQUACULTURE LAB



The new feed eliminates conventional fish meal and fish oil while providing better fish weight gains and higher nutritional value in farmed fish for humans. (Photo courtesy of Robert Gill)

Aquaculture breakthrough: better fish-free feed

UC Santa Cruz researchers Pallab Sarker and Anne Kapuscinski have come up with a new aquaculture feed formula using marine microalgae that is more sustainable and eliminates conventional fish meal and fish oil ingredients.

New research on aquaculture feed will test alternative ingredients to help minimize water pollution

July 02, 2021

By Allison Arteaga Soergel

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Researchers from UC Santa Cruz's ecological aquaculture lab won a three-year, \$1 million grant from the Agriculture and Food Research Initiative at the USDA National Institute of Food and Agriculture. This funding will support collaborative research to develop, test, and evaluate new low-polluting fish feed formulas for farm-raised rainbow trout.

Associate Research Professor of Environmental Studies Pallab Sarker will lead this work alongside Environmental Studies Professor Anne Kapuscinski and Luke Gardner, a California Sea Grant extension specialist affiliated with UC San Diego. The team will use a marine microalga as an ingredient in their fish feed, and the resulting experimental formulas will be field-tested at working trout farms in California.



At UC Santa Cruz's ecological aquaculture lab, researchers are working with rainbow trout to test new sustainable fish feed formulas developed using alternative ingredients. Photo: Carolyn Lagattuta.

Integrated Aquaculture-Agriculture Pilot Test

Integrated Aquaculture-Agriculture (IAA):

- Aquaculture wastewater contains essential nutrients that plant crops need to grow.
- IAA diverts aquaculture wastewater to crop production.
- IAA increases nutrient and water use efficiencies of both production streams.

Project Objectives:

- Demonstrate principles of IAA at the Center for Agroecology.
- Test efficacy of recirculating aquaculture effluent as organic fertilizer.
- Investigate potential of wicking beds for IAA.



Plant growth over a three month period irrigating with aquaculture wastewater

Upcycling of Aquaculture Wastewater



Water is flushed from biofilters once a week, removing solid waste from recirculating aquaculture systems and stored in holding tank.



Water flows passively from holding tank into the IAA wicking beds.



Layers of Wicking Beds

Ag pipe, shade cloth, and mulch maximize water capacity in reservoir



Compost, potting mix, and cover crops provide soil fertility and structure

