Aquacultural Bioprocessing of Algal Biomass:
Enabling Sustainable Seafood & Biofuel Co-Production

ABSTRACT:
Increasing seafood supply will likely be dependent upon successful deployment of sustainable land-based marine aquaculture systems. The best hope for widespread, environmentally benign aquaculture is through development and implementation of integrated, open-pond, high-rate microalgae and marine aquaculture production. Microalgae production may be used to maintain water quality within zero-discharge aquaculture systems while simultaneously serving as the basis of a “designed ecosystem” providing complete replacement of imported marine fishmeal in cultured fish and shrimp diets. The environmental advantages of widespread deployment of “green water” aquaculture and misconceptions concerning algal cultivation for bioenergy and greenhouse gas reductions are highlighted. Economic projections suggest sustainable seafood with animal feeds and bioenergy co-production offers the most cost-effective application of algal technology, with 85% of cash-flow provided by shrimp and/or fish sales, with an additional 10% from animal feeds and 5% from bioenergy/biofuels co-production.

BIOGRAPHICAL:
D. E. Brune serves as Professor of Bioprocess and Bioenergy Engineering within the Division of Food Sciences and Bioengineering at the University of Missouri at Columbia. His research has been directed at quantifying, modeling, and optimizing the role of photosynthesis in existing and emerging aquacultural practices. At Clemson University he served as Endowed Chair of Natural Resources Engineering where his work led to U.S. patented, “Partitioned Aquaculture System” and “Controlled Eutrophication Process.” At the University of Missouri, he leads a research and extension effort targeting deployment of integrated aquaculture / algal culture systems supporting co-production of bioenergy with environmental protection and remediation. He is a founding member and past president of the Aquacultural Engineering Society. Dr. Brune has published or presented 60+ technical papers and 100+ presentations at national and international symposia and has served as technical advisor to national and international committees, including the “International Network on Biofixation of CO₂ and Greenhouse Gas Abatement with Microalgae.

DATE • TIME • LOCATION:
Tuesday April 30, 2013, 4:00 PM, 105 Agricultural Engineering Building