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## Isotopic applications for ecologically sound cost effective aquaculture production

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Aquaculture is the fastest growing food producing sector globally. Future growth of aquaculture depends on a more ecologically sound management practice. The dietary effects on nutrient assimilation, isotopic turnover rates and discrimination factors were assessed using exponential models to determine the influence of microalgal diets on the growth and survival of hatchery-reared Pacific oyster larvae. Of the four dietary treatments used, larvae fed with *Chaetoceros calcitrans* and a mixed diet had the best growth and high survival. Isotopic analysis of tilapia muscle tissue and all potential dietary sources from daily and weekly fed tilapia ponds suggests that natural feed such as detritus, algae and zooplankton appear to be favored more by tilapia than formulated feed. After 90 days of cultivation, the average final body weight of tilapia receiving daily feed inputs was 134 g while in weekly feed it was 92 g. The feed conversion ratio (FCR) was very high in the daily fed tilapia compared to a small FCR in the weekly fed ponds. Feed input cost for the weekly feeding treatment was much less than the daily feeding treatment. Isotopic techniques have the potential to develop cost-effective environment friendly aquaculture.

### Biography

Debashish Mazumder is a Senior Research Scientist in the Australian Nuclear Science and Technology Organization (ANSTO) with more than 20 years of experience in Aquaculture and Aquatic Ecology. He also holds adjunct academic positions at the University of New South Wales (UNSW), Macquarie University (both within Australia) and Beijing Forestry University, China. His area of expertise includes using nuclear and isotopic techniques to quantify the impacts of water management, land use and climate variability on the structure and function of aquatic ecosystems and to maximise the benefit of aquaculture operations. From 1990 to 1999, he worked with the WorldFish Centre to improve the production and management of aquaculture in Bangladesh. Since 2006, he has been collaborating with universities and government agencies in Australia, PNG, Malaysia and China on various environmental and aquaculture projects. He is an Associate Editor of WETLANDS, and published a significant number of peer reviewed journal papers and scholarly book chapters on stable isotopes.

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