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RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

Title: Stocking Densities and Fertilization Regimes for Nile Tilapia (*Oreochromis Niloticus*) production in Ponds with Supplemental Feeding

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Abstract: The purposes of the study, consisting of two experiments, were to determine the upper limits to tilapia production utilizing supplemental feeding and appropriate fertilization regimes for controlling nutrient addition and maintaining good water quality. In order to test these, Nile tilapia fingerlings were stocked at 3, 6, and 9 fish m⁻². The fish were supplementally fed to 50% satiation during culture of 155 and 194 days for experiments 1 and 2, respectively. While ponds were fertilized at fixed rates (4 kg nitrogen and 1 kg phosphorus per hectare per day) throughout experiment 1, ponds in experiment 2 were fertilized at various rates to balance nutrient contents of feeding wastes, bringing nutrient loading to the same levels as in experiment 1. The experiments were conducted at the Ayutthaya Freshwater Fisheries Station, Thailand.

Growth, survival, yield, and water quality were evaluated during both experiments. Growth continued in a linear fashion throughout the experiments. Survival also differed significantly among treatments in both experiments, with lowest rate at the highest density. Feeding rates averaged 1.86% and 1.65% of the body weight per day in experiments 1 and 2, respectively, and were not significantly different among treatments in each experiment. Feed conversion rates averaged 1.18 and 1.38 for experiments 1 and 2, respectively, and also were not significantly different among treatments. Most water quality parameters were not significantly different among treatments, and did not deteriorate at least during the initial 155

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days. The reduced growth and survival in high density ponds appears to be a behavioral or physiological response to density itself, not to water quality. Partial economic analyses indicated that the 3 fish m⁻² treatments were profitable, while the 6 or 9 fish m⁻² treatments were unprofitable in both experiments. At present, the best system seems to be culturing at 3 fish m⁻² with intensive feeding and balanced fertilization.

This abstract is excerpted from the original paper, which was a proceeding of the Sixth International Symposium on Tilapia in Aquaculture.

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