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Productivity and Economics of Nile Tilapia *Oreochromis niloticus* Cage Culture in South-East Brazil

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ABSTRACT

Fish cage culture is an intensive, continuous-flow fish farming system, allowing intensive exploitation of water bodies with relatively low capital investment. This study aimed to determine the production function of Nile tilapia, Oreochromis niloticus, in cages; the profit-maximizing biomass at 300–400 and 500–600 fish per m^3 for cages of different volumes; and the influence of water body conditions in fish performance. Feed intake, survival rate, and water temperature were monitored daily; dissolved oxygen, pH, and transparency of water were monitored each 15 days. Caged tilapia were fed daily on commercial, floating pellets (32% crude protein) at 0900, 1300, and 1700, and feeding rate was adjusted based on weight gain and survival rate. Data were analyzed statistically by ANOVA (P = 0.05) and regression analysis; the Mitscherlich function was chosen to represent the production function. Carrying capacity of both stocking

densities reached 200 kg/m^3 and no differences were found ($P > 0.05$) regarding accumulated biomass and individual average weight over time. The larger stocking density yielded larger accumulated biomass and had better feeding efficiency and no differences between individual average weights of fish at both densities were observed ($P > 0.05$). Profit-maximizing biomass at 500–600 fish/m^3 was 145 kg/m^3 and at 300–400 fish/m^3 was 121 kg/m^3. Cage farming of Nile tilapia at 500–600 fish/m^3, individual average weight 283 g, presented many advantages: optimization of space and production time, better feed efficiency, higher fish production per unit volume of cages, and increased profitability.

KEYWORDS:

Oreochromis niloticus | cage farming | production functions | biomass