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Title: Influence of Nile tilapia (*Oreochromis niloticus*) stocking density in cages on their growth and yield in cages and in ponds containing the cages

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Abstract: An experiment was conducted for 90 days at the Asian Institute of Technology in Thailand to investigate the appropriate stocking density of large Nile tilapia placed in cages in earthen ponds where small Nile tilapia were stocked in open water to utilize the wastes derived from the cages. Large male tilapia (141 ± 11.1-152 ± 2.1 g) were stocked at 30, 40, 50, 60, and 70 fish m^{-3} in 4-m^3 net cages. One cage was suspended in each of 15 earthen ponds, and three replicates were used for each density. Small male tilapia (54 ± 2.3-57 ± 1.2 g) were stocked at 2 fish m^{-3} in open water of all ponds. Caged tilapia were fed twice daily at 3%, 2.5%, and 2% body weight day^{-1} during the first, second, and third month, respectively, with commercial floating pellets containing 30% crude protein. Water quality was analyzed biweekly.

Stocking densities of caged tilapia had significant ($P<0.05$) effects on the survival, growth, and food conversion ratio of caged tilapia, and on the growth of open-pond tilapia. The survival of caged tilapia decreased from 91.4% ± 5.0 to 57.2% ± 8.1 with increased stocking densities from 30 to 70 fish m^{-3}, while survival of pond tilapia was higher than 90.0% in all treatments. The average treatment mean weights of tilapia harvested from cages ranged from 509 ± 26.0 to 565 ± 13.9 g. The growth of pond tilapia was quite slow, with daily weight gain increasing from 0.30 ± 0.02 to 0.47 ± 0.08 g per fish day^{-1}, in response to increased feed inputs to caged tilapia. The combined net yield of both caged and open-pond tilapia was highest in the treatment with 50 fish m^{-3}. Water quality analyses indicated that the wastes from caged tilapia were insufficient to generate abundant natural food for the growth of open-pond tilapia.

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