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## RESEARCH REPORTS

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**Title:** Ammonia Dynamics in Fertilized Fish Ponds Stocked with Nile Tilapia

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**Abstract:** Total ammonia nitrogen pathways in fertilized fish ponds stocked with Nile tilapia *Oreochromis niloticus* were investigated. Three fertilizer treatments were used in a field experiment in Thailand: weekly application of 500 kg dry chicken manure/ha (1.2 g N/m<sup>2</sup>), 44 kg dry chicken manure plus 24 kg urea/ha (1.2 g N/m<sup>2</sup>), and 500 kg dry chicken manure plus 280 kg urea/ha (14.3 g N/m<sup>2</sup>). Substantial quantities of ammonia were reduced from pond water in each treatment during daylight hours. Ponds lost 36-75% of the average total ammonia that was present in early morning during daylight hours. Losses to the atmosphere (flux) were relatively small, varying from 1-5% of the total diurnal ammonia reductions. Uptake by algae was the most important mechanism for removal of ammonia from pond water. Net primary productivity varied between treatments and increased with the increased availability of inorganic nitrogen. Increasing the total ammonia present in the early morning increased net primary productivity. Fish mortalities were 71% in ponds with the highest weekly nitrogen input (14.3 g N/m<sup>2</sup>) and were between 22 and 26% in the two treatment ponds with low weekly nitrogen input (1.2 g N/m<sup>2</sup>). Average maximum concentrations of un-ionized ammonia (0.6 mg/L at 1600 hours), and low dissolved oxygen (2.8 mg/L at 0600 hours) may have combined to increase mortality in ponds with high nitrogen inputs. In the highest nitrogen treatment, neither the uptake of ammonia by algae nor its volatilization to the atmosphere reduced un-ionized ammonia concentration to a level safe for fish.

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