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Sustainable Aquaculture for a Secure Future

Title: A Yield Model for Walking Catfish Production in Aquaculture Systems

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Abstract: A yield model for *Clarias* culture was produced using a combination of laboratory data for *Clarias lazera* and field data on *Clarias batrachus* culture in Thailand. The model was used for simulations to fulfil three distinct objectives: (1) to consolidate knowledge of fish physiology and aquaculture practices for *Clarias* into a model which can be validated; (2) to determine sensitivity of predictions to variation in model parameters; and (3) to predict yield of *Clarias* ponds under different stocking density, size at stocking, and type of containment. The accuracy of this model was tested with an independent data set of 32 grow-out periods. The model was relatively poor at predicting yield when the measured feeding rate was input ($r^2 = 0.022$), but reasonably good at predicting yield if maximum feeding rate was input ($r^2 = 0.52$). This may reflect poor data collection of feeding rate in the ponds. Sensitivity analyses indicated that changes in parameters related to maximum consumption showed high importance in predicting yield, while changes in metabolic parameters had low importance. A doubling of feeding rate increased yield 548% in earthen ponds and 465% in concrete tanks. Density stocked was of secondary importance in increasing simulated yield, while size at stocking was relatively unimportant. The maximum consumption rate of different food types (pellets, trash fish) was also extremely important in determining simulated yield.

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