

NOTICE OF PUBLICATION



AQUAFISH COLLABORATIVE RESEARCH SUPPORT PROGRAM

RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

Title: Partial nutrient budgets for semi-intensive shrimp farms in Honduras

Author(s): David R. Teichert-Coddington ^a, Delia Martinez ^b, Eneida Ramírez ^b

^a Department of Fisheries and Allied Aquacultures, Alabama Agriculture Experiment Station, Auburn University, 203 Swingle Hall, Auburn, AL 36849, USA

^b Laboratorio de Calidad de Agua, La Lujosa, Choluteca, Honduras

Date: May 5, 2010

Publication Number: CRSP Research Report 00-A06

The CRSP will not be distributing this publication. Copies may be obtained by writing to the authors.

Abstract: Shrimp farms in Latin America typically have relatively low stocking rates and are managed without aeration. Nutrient budgets for these farms have not been well established. Intake and discharge from 21 ponds on six shrimp farms located on estuaries or embayments of the Gulf of Fonseca in Honduras were characterized during rainy and dry seasons. Mean shrimp stocking rate, yield, and feed conversion ratio FCR for these ponds were 8.2/m², 633 kg/ha, and 2.74, respectively. Mean intake values of soluble reactive phosphate (SRP), dissolved inorganic nitrogen (DIN), total nitrogen (TN), total phosphorus (TP) and BOD₅ were significantly higher in estuaries than in embayments during both seasons. Water exchange produced a mean net discharge of TN, TP, BOD₅, chlorophyll *a*, COD, total alkalinity and salinity, and a mean net intake of DIN; mean SRP was practically equal in discharge and intake water. Each kilogram of feed nitrogen and phosphorus applied to ponds resulted in 0.21 kg of net nitrogen discharge and 0.16 kg of net phosphorus discharge by water exchange. Use of inorganic fertilizers promoted net discharge of phosphorus and nitrogen. Net nitrogen discharge by water exchange significantly increased as nitrogen input by feed increased ($P < 0.01$). Ponds gained nitrogen primarily from intake water (63%) and feed (36%), and nitrogen was lost primarily from water exchange (72%) and harvested shrimp (14%). Ponds gained phosphorus mostly from intake water (51%) and feed (47%) and phosphorus was lost primarily from water exchange (56%) and harvested shrimp (9%). About 7% of input nitrogen and almost a third (31%) of input phosphorus were not accounted for in measured losses, and presumably were fixed or metabolized in ponds. Mean conversion of feed nitrogen and phosphorus to shrimp flesh averaged 41% and 20%, respectively. Each kilogram of

CRSP RESEARCH REPORTS are published as occasional papers by the Management Entity, AquaFish Collaborative Research Support Program, Oregon State University, 418 Snell Hall, Corvallis, Oregon 97331-1643 USA. The Aquafish CRSP is supported by the US Agency for International Development under CRSP Grant No. EPP-A-00-06-00012-00. See the website at <aquafishcrsp.oregonstate.edu>.

Continued...

shrimp production resulted in 16.8 g of net nitrogen loss and 2.3 g of net phosphorus loss by water exchange.

This abstract was excerpted from the original paper, which was in *Aquaculture* 190:139-154, 2000.

CRSP RESEARCH REPORTS are published as occasional papers by the Management Entity, AquaFish Collaborative Research Support Program, Oregon State University, 418 Snell Hall, Corvallis, Oregon 97331-1643 USA. The AquaFish CRSP is supported by the US Agency for International Development under CRSP Grant No. EPP-A-00-06-00012-00. See the website at <aquafishcrsp.oregonstate.edu>.