



Aquaculture in American Samoa

Aquaculture Extension Agent: Darren K. Okimoto



Introduction

Attempts by the American Samoa government to diversify its economic base are hampered by American Samoa's remote location, limited means of transportation into and out of the Territory, and exposure to severe weather. With a 12 percent unemployment rate on average, and little infrastructure to support tourism, there is a critical need for creating industries that will be sustainable and compatible with traditional Samoan culture.

In September of 2002, the University of Hawai'i Sea Grant College Program, with the assistance of Congressman Eni Faleomavaega and American Samoa Community College President Adele Satele-Galea'i, established a Sea Grant Extension presence in American Samoa for the purposes of promoting aquaculture development, including:

- Developing economically feasible aquaculture in American Samoa that is culturally relevant, incorporates best management practices and is accepted by the community
- Working with Pacific Regional Aquaculture Extension Service partners to create economically viable giant clam and tilapia industries in American Samoa and the surrounding region

UH Sea Grant Extension plays a vital role in the American Samoa community by serving as a conduit for information and technology transfer between researchers and aquafarmers.

These activities, which focus on education and outreach programs, and capacity building and training of personnel throughout Hawai'i and the U.S.-affiliated Pacific Islands, are designed to assist in the development of the aquaculture

industry and produce an educated community that will make significant contributions to the local economy and foster wise stewardship practices in American Samoa.

1999-2003 Sea Grant Funding

UH Sea Grant: \$104,579



Samoa Family Sunfish Cooperative President Alosina To'omalatai shows his red tilapia brood stock tank.

Activities

- Provide information and technical support remotely and on-site to facilitate aquafarm development and improve production
- Partner with Hawai'i aquaculture extension agents, researchers and the local tuna canneries on a cooperative research project to examine the feasibility of utilizing tuna cannery by-products to produce cost-effective locally produced feeds/feeding regimes for use by aquafarmers in American Samoa

- Attend monthly meetings held by the Samoa Family Sunfish Cooperative, an organization composed of tilapia aquafarmers in American Samoa, and provide advice and/or information as needed to improve production and lower costs
- Conduct at least two training/technical aquaculture workshops in collaboration with local, regional and international aquaculture researchers and extension service partners
- Provide K-12 educators with information and technical support on developing an on-site aquaculture program at their schools
- Collaborate with the Pacific Business Center Program to assess the local market demand for tilapia and the international market demand for giant clams

Results and Impacts

UH Sea Grant Extension:

- Promoted development of the American Samoa tilapia aquaculture industry by establishing tilapia hatchery and grow-out farms, and assisting in the formation of the Samoa Family Sunfish Cooperative, a tilapia co-op
- Promoted and developed the local ornamental clam industry by partnering with, and providing technical support and assistance to Native Resources Developer, Inc., a local non-profit, to establish a giant clam hatchery/educational training facility in Alao
- Conducted five training/technical aquaculture workshops in 2003, including: Micro-loan Business Planning, Tilapia Culture, Tilapia Culture with Special Emphasis on Pond Management, Tank Construction and Cost-effective Feeds, and Feeding Regimes for Aquaculture Producers



Tilapia aquaculture workshop at Le'atele Elementary school being conducted by UH Sea Grant aquaculture interns



Development of the giant clam hatchery at Alao.

Industry Applications

Sustainable industries that are compatible with traditional Samoan culture are represented by the following:

- Seven tilapia farmers submitted business plans for \$500-2,500 micro-loans following participation in a micro-loan workshop
- A tilapia hatchery for the tilapia farmer's co-op is being built on an aquaculture farm in Onenoa
- Construction of 16 raceway tanks and two 12-foot diameter circular tanks to raise giant clams and red tilapia at an aquafarm in Alao
- Tilapia are being raised at Le'atele Elementary School in Fagasa village by elementary school students as a school project designed to teach aquaculture principles to the students

Education

UH Sea Grant Extension in American Samoa enhances opportunities for undergraduates seeking a career in the aquaculture industry through the Minority Serving Institutions Student Internship Program in Aquaculture and in natural resources through the Micronesia-American Samoa Student Internship Program.

Extension also fosters and enhances academic programs and collaborations between the University of Hawai'i at Mānoa, American Samoa Community College and its partners to develop undergraduate educational programs in marine science and build local capacity.



Samoa Family Sunfish Cooperative Vice President Maiava Hunkin receiving his micro-loan workshop completion certificate from Okimoto.

Publications

R.D. Howerton, D.K. Okimoto and E.G. Grau. 1992. The effect of orally administered 17 α -methyltestosterone and 3,3'-triiodo-L-thyronine on growth of seawater-adapted tilapia, *Oreochromis mossambicus* (Peters). *Aquaculture and Fisheries Management* 23: 123-128.

G.M. Weber, D.K. Okimoto, N.H. Richman, III and E.G. Grau. 1992. Patterns of thyroxine and triiodothyronine in serum and follicle-bound oocytes of the tilapia, *Oreochromis mossambicus*, during oogenesis. *General and Comparative Endocrinology* 85: 392-404.

T.T. Kuwaye, D.K. Okimoto, S.K. Shimoda, R.D. Howerton, H. Lin, P.K.T. Pang and E.G. Grau. 1993. Effect of 17 α -methyltestosterone on the growth of the euryhaline tilapia, *Oreochromis mossambicus*, in fresh water and in sea water. *Aquaculture* 113: 137-152.

D.K. Okimoto, G.M. Weber and E.G. Grau. 1993. The effects of thyroxine and propylthiouracil treatment on changes in body form associated with a possible developmental thyroxine surge during post-hatching development of the tilapia, *Oreochromis mossambicus*. *Zoological Science* 10(5): 803-811.

D.K. Okimoto, J.J. DiStefano, III, T.T. Kuwaye, B. Ron, G.M. Weber, T.T. Nguyen and E.G. Grau. 1994. On plasma volume measurement and effects of experimental stress in the male tilapia, *Oreochromis mossambicus*, maintained in fresh water. *Fish Physiology and Biochemistry* 12(5): 431-438.

Partners

- American Samoa Community College and its Land Grant Program
- American Samoa Resource & Development Council, Inc.
- Coral Reef Advisory Group
- UH Hawai'i Institute of Marine Biology
- Le'atele Elementary School
- Native Resources Developer, Inc.
- Pacific Aquaculture and Coastal Resources Center
- Pacific Business Center Program
- Samoa Family Sunfish Cooperative
- Secretariat of the Pacific Community
- USDA Natural Resources Conservation Services
- American Samoa Women's Business Center



Darren K. Okimoto is UH Sea Grant's aquaculture and marine biology specialist who coordinates UH Sea Grant aquaculture activities in American Samoa. Acting as a liaison with the aquaculture industry, he works with the local community and other extension staff.

Okimoto also directs the Marine Science Program at American Samoa Community College, where he instructs a course on marine science, and teaches and assists in the management of student internship programs.

Okimoto grew up in Honolulu and attended Kaimuki High School. Aspiring to become a marine biologist, Okimoto majored in zoology at the University of Hawai'i.

He received his Ph.D. at the University of Delaware.

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