

## Aquaculture — Now, Factory Fish Farming

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"Aquaculture 1983" was the title of a 5-day symposium and industry exhibit held in Washington, D.C., on January 9-13, 1983, sponsored by World Mariculture Society, Catfish Farmers of America, Fish Culture Section of the American Fisheries Society, U.S. Trout Farmers Association, Shellfish Institute of North America, and National Shellfisheries Association. While ecologists, economists, futurologists, and others have touted the virtues and potentials of intensive fish and shellfish farming, this growing industry in the U.S. may become blighted by the same problems that have come to afflict agribusiness' "factory farming" of crops, livestock, and poultry.

Industry exhibits told the story — there were displays on herbicides and algicides to control the proliferation of plant life in overstocked and polluted fish ponds, and aeration systems to help alleviate pollution from fish excrement and rotting food in the water. Antibiotics such as tetracycline and sulfonamides were promoted for incorporation into feed, along with other drugs to control fish parasites and fungal infections. And a variety of autogenous bacterins (vaccines) were also marketed to help combat disease. One industry exhibitor even admitted that all this was necessary because, just as in agriculture, the use of monocultures (raising of a single species) is ecologically unsound and creates disease problems. Another spokesman added that all these exogenous agents are necessary because the fish are crowded, and so are under stress and therefore more prone to dis-

ease. Bacterial resistance to some antibiotics has already emerged as a recognized problem.

In sum, aquaculture is now on the agribusiness treadmill of increasing dependence on technology and drugs (thereby providing a lucrative business for support industries, especially the chemical and pharmaceutical industries), in order to rectify intrinsically unsound husbandry practices. But does the U.S. really need more animal protein, at potential risk to consumer health from drug residues in fish and shellfish produce, and from antibiotic-resistant bacterial strains? Especially when aquaculture means new costs to consumers, who pay for the federal agencies that regulate chemical and drug residue levels and who thus help indirectly to subsidize chemical farming? And what of the welfare of the fish that are confined in crowded, polluted, chemical- and drug-saturated tanks and ponds? The possibility of "organic" and humane aquaculture, without overstocking and overuse of drugs, fades into improbability, as the values and economic structure of the rest of agribusiness begin to saturate this fledgling industry.

And an interesting postscript: One exhibit from the College of Veterinary Medicine, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, solicited donations to help support the University's Florida Foundation Gator Fund to develop new techniques in *alligator* production.