By and for the Big Island aquaculture community

Big Island Aquaculture News

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Announcements

Workshop: *Getting Started in Aquaculture* On Saturday, January 28, Jim Szyper will present this free workshop at the Komohana Agricultural Complex in Hilo. This session is for people who are looking for information about aquaculture for the first time, as well as those who have gathered some information and would now like to learn what can be grown in Hawaii and how to get started. The major products of Hawaii will be discussed, as well as the major considerations for starting to grow products for home use or commercial purposes. The session will begin at 9:00 A.M., and finish near noon. Sign in and refreshments will be available beginning at 8:30. Contact Jim at 981-5199 or email *jszyper@hawaii.edu* for further information.

Information Sources

The Office of Energy Efficiency and Renewable Energy (EERE) This U.S. Department of Energy division maintains the web site *www.eere.energy.gov/*, which bills itself as "a gateway to hundreds of web sites and thousands of online documents" on the title subjects. There are links to seven classes of renewable energy: biomass, geothermal, hydrogen, hydropower, ocean, solar and wind. All of these have been the subjects of research in Hawaii; at least five of them have been or are presently used in practical terms on the Big Island. The aquaculture extension service is conducting an R&D project in East Hawaii that includes a solar photovoltaic power system to support an innovative culture system. Details will be provided in this newsletter as the work goes on. Because Hawaii is the solar-energy-richest state (well, some parts of it), and one of the most dependent on external sources of fuel, it is worth our getting to know the solar energy technologies (*www.eere.energy.gov/solar/*): Photovoltaics, which use "semiconductor materials that convert sunlight directly to electricity"; Solar Heating, low temperature collection and distribution of heat from solar energy, as in home hot water systems; Concentrating Solar Power, use of "reflective materials that concentrate the sun's heat energy to drive a generator," as in one of the more recent James Bond films; and Solar Lighting, in which "parabolic collectors focus sunlight into a fiber optic system to illumi-

Readers' contributions are invited with aloha, and much appreciated, though not all can be used. They may be mailed, faxed or emailed to the editor at this address. Contributors understand that materials may be edited for space and other considerations.

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nate .." (maybe that's what was in the film?). The Big Island's "off-the-grid" farms and homes make these ideas even more important.

Updates

Soy Meal in Aquaculture Feeds It is well known to those who follow aquaculture feed development that soybean meal is the main plant protein source substituted for fish meal in feeds. It is also reasonably well known that soybeans naturally contain, in addition to their proteins, lipids, and carbohydrates, a number of compounds that work against use of the basic materials by animals that eat the beans. These are called antinutritional factors (ANF). ANF can be destroyed by heat treatment, including cooking feed components in extruder machines that make the final feed product. A note in the December issue of World Aquaculture magazine (vol. 36 no. 4) says that "ANF levels in SBM (soybean meal) vary depending on factors such as cultivar and growing conditions and there are relatively few definitive data on the effects of ANF in aquaculture species." A newly established research program aims to "develop a database that will serve as a ready source of information for the use of SBM in diets fed to aquatic animals, and will reduce the speculation regarding factors limiting its use." The program will analyze, free of charge, test diets for ANF, for presumably any researcher whose test plan will produce some basic standard results that can be shared in the database, which will be available to "all interested parties." The program is a collaborative effort of the United Soybean Board's Soy-in-Aquaculture (SIA) Managed Research Program, and Archer Daniels Midland Company (ADM). This offer of free analysis and information by these major agricultural players illustrates the importance of the animal-protein-substitution is-

TECHNICAL NOTES

Channel and Chinese Catfish

The U.S. channel catfish (*Ictalurus punctatus*) industry is huge and persistent, but characteristically operates with a "very thin profit margin" according to Steeby and Wagner (2005). The farm gate price of catfish is always well under $1.00 per pound, and their production costs include their being fed prepared feeds in earthen ponds that are often equipped with fuel driven paddlewheel aerators. The much smaller but still persistent Hawaii Chinese catfish (*Clarias fuscus*) industry operates with poorly known profit margins (not much data is collected; many farmers don't know their production costs). The prices received by Hawaii farmers range from $3 to more than $5 per pound in different places and different years; the fish are fed prepared feeds in a variety of (generally small and not earthen-bottomed) containers, with various approaches to aeration, which can be omitted if one counts on the fish breathing air when necessary. This note makes some further comparisons of the two industries. The channel catfish data are taken from the four largest-producing states detailed in the USDA's Catfish Production Report 2003, namely Alabama, Arkansas, Louisiana, and Mississippi. Many of the differences are accounted for by the two species being from different taxonomic families and living in different climate zones.

Twelve to fourteen percent of channel catfish businesses bred catfish or operated hatcheries, with some farms allowing eggs to hatch in breeding ponds, thus bypassing hatchery operation. In Hawaii, most producers breed their own fish, or used to. The percentage is smaller, likely less than 50%, on the Big Island due to the successful op-

eration of Jerome Sasaki's sizeable hatchery business. Chinese catfish may reproduce in production ponds, but not in practical numbers. The seasonal temperature regime on the U.S. mainland has the channel catfish spawning in their breeder ponds (spontaneously, in log cavities in pond banks or in artificial shelter such as the traditional milk cans) in spring and early summer. The hormone-induced spawning of Chinese catfish has been accomplished in every month of the year, with traditional perceptions of best readiness during April - October. Jerome's experience and accomplishments with year-round breeding indicate that good feeding, water quality, and hatchery practices are important in extending the breeding season, which is still more difficult during the coldest winter months. In a given year, 30 to 40 percent of channel catfish broodfish females spawn successfully; the hormone-assisted procedure for Chinese catfish works with nearly complete success.

The U.S. channel catfish industry maintains nearly 900,000 broodfish, which weigh an average of about 2.2 kg each, typically 2+ to 6 years of age. Chinese catfish can be spawned at about 1 year if they have grown large enough (0.12 kg) and appear gravid. Larger older fish produce more eggs if nutrition is adequate. Channel catfish broodfish are from actively improved lines, or selected on-farm less formally. Jerome has made some effort to renew genetic diversity in his breeding stock by taking in fish from other locations within the state; the practices of others here are undocumented. Reference:

Steeby, J.A., and B.A. Wagner, 2005. Channel catfish hatchery and fry production practices in the U.S. catfish industry. *World Aquaculture* 36 (4): 14-17 (December 2005).

Bottom-Feeding Daphnia *for Chinese Catfish*

Kevin Hopkins, professor of aquaculture at UH Hilo, and later Jerome Sasaki of Honomu Aquatics in East Hawaii, are to be credited with demonstrating some years ago that newly-hatched Chinese catfish fry do not need to be fed live brine shrimp nauplii. Kevin found a technical report from Auburn that described the use of hard-boiled egg screened through metal strainer mesh to feed fry, and was able to raise *Clarias* fry with that as the sole first feed. Fine-textured starter size prepared feed was offered after a few days. At our recommendation, Jerome started that way, but soon found that the egg was not needed, and he has since produced many good surviving batches with starter feed. Still, Jerome and others have observed that live feeds are highly pleasing to the fish, and appear to increase their vigor.

Jerome has been raising *Daphnia* as an alternative to purchasing brine shrimp cysts and hatching them. *Daphnia* and other planktonic feeds (the related *Moina* and the unrelated rotifers) will reproduce in culture, eliminating the cyst expense. Brine shrimp also reproduce in culture, but it is inconvenient to recover the smallest ones. He was feeding them with a mixture of yeast and powdered feed blended together in a coffee grinder, a development of Tommy Sakamoto in Hilo for his cultures.

Jerome recently found that he could skip the yeast component with the larger *Daphnia*. The other dedicatedly-planktonic animals need the yeast, which remains suspended in the water, and may help keep powdered feed particles with it. The *Daphnia* seem happy to visit the container bottom to eat the sinking feed. This saves the effort of making the yeast preparation. Thanks to Jerome for sharing this information.