



Announcements

Employment Opportunities

- Aquaculture Technician. The Pacific Aquaculture and Coastal Resources Center (PACRC) at UH Hilo is seeking one or more full time technicians. The term of this temporary employment is limited to 3 to 6 months. One or more permanent positions are expected to be open at that time, and holders of the temporary position(s) may apply. For further information, email Dr. Kevin Hopkins at hopkins@hawaii.edu.

- Aquaculture company looking for general manager. Responsibilities include management of animal care, R&D, maintenance, payroll and bookkeeping. At least a minimum of 4 years of aquaculture experience required. Fax resume to 808 331-2457.

- Aquaculture R&D company, located at NELHA, is seeking aquaculture workers - fulltime. No experience needed, training will be provided. Main duty will be animal care. If you are motivated, willing to work hard and learn on the job, we are looking for you! We offer competitive salaries (\$11-\$13/hr), great benefits and a fun work-

ing environment. Send your resume to jobs@moanatech.com.

- Hatchery Technician. Full time/Part time position for an aquaculture company at NELHA, Kona. Duties include: Maintaining indoor/outdoor microalgae, rearing animal larvae and packing and shipping aquaculture products. Aquaculture or biology related experience preferred. Fax resume to 326-7962 or email to ohennig2002@yahoo.com or call 329-6662.

From Dean Toda at ADP: "The *Food and Agriculture Export Readiness Training Program* will begin in October 2006. If you are currently exporting product or are thinking of entering the export market, this program could be of great benefit to your company. To learn more about this program, attend one of the information sessions starting next week on all the major islands." (Hilo Tues. Aug. 15, 10-11:00 AM, Hawaii Innovation Center, 117 Keawe St.; Kona Wed. Aug. 16, 3-4:00 PM, King Kam Hotel). If you'd like a copy of the flier he sent around, or if you have questions, email Dean at dtoda@hawaiiaquaculture.org or call 587-0030.

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. This newsletter is part of a cooperative project funded by the University of Hawaii Sea Grant College Program, the UH Cooperative Extension Service, and the State of Hawaii Aquaculture Development Program.

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An interagency subcommittee of the U.S. government is developing a draft document titled, "*Charting the Course for Ocean Science in the United States: Research Priorities for the Next Decade.*" The draft is to be released for public comment soon. Public briefings on the national ocean research priorities will be held during the next few months in several cities including Honolulu (August 25, 2006 at 1:00 p.m. at the Hawaii State Capitol Auditorium, 415 South Beretania Street, Honolulu - see more at ocean.ceq.gov/about/sup_jsost_orpp_outreach.html). Information and discussion will be included at meetings of professional societies. "Members from the research community, industry groups, ocean educators, government representatives ..., non-governmental organizations, and any interested individuals are invited to attend." For the Honolulu session, they ask that attendees RSVP by August 18 to Shelby Walker at swalker@usgcrp.gov.

Information Sources

The TECHNICAL NOTES item below addresses the use of formalin in food-production aquaculture. For a comprehensive treatment on chemicals, see the latest (January 2004) multi-agency federal *GUIDE TO DRUG, VACCINE, AND PESTICIDE USE IN AQUACULTURE* at ag.ansc.purdue.edu/aquanic/jsa/wgqaap/drugguide/drugguide.htm. After that, consider an always-enjoyable look at AquaNIC, just back off the url to ...aquanic/.

Many of us in aquaculture would prefer to "just grow fish," but we can't do our best at that without getting along with the larger world. For a reasonably brief, informed-opinion perspective on this relationship, see *Axioms of Ecological Policy* by Robert Lackey (*Fisheries* 31(6):286-290, or on line

at www.fisheries.org/html/fisheries/F3106/F3106issuep286-290Lackey.pdf). The tag line on the index page says, "Those of us who provide information to help inform the participants involved in ecological policy debates must recognize the reality that scientific information is just one element in complex political deliberations in a democracy."

TECHNICAL NOTES

Formalin, Regulated

Both our state Aquaculture Development Program (ADP) and the U.S. Dept. of Agriculture have recently referred the aquaculture community to a reminder on the web site of the Food and Drug Administration's CVM (Center for Veterinary Medicine, www.fda.gov/cvm/bseAquaProducers.htm). This organization is responsible for administering the use of chemicals in commercial production of aquaculture food products. The reminder states that only three name brands of formalin are approved for disease treatment in commercial food fish aquaculture. This note addresses some questions and details pertinent to the subject.

First, ADP supports the state aquaculture veterinarian, as well as the aquaculture extension service. We are all on the same side with regard to advising producers about health management and government regulations. The ADP reminder item says, "...For access to the labeled formalin products (named at the above web site), contact the State Aquaculture Veterinarian, Allen Riggs." He can be reached at 808 832-5004 or email acriggs@hawaiiiaquaculture.org.

One reasonable question about the CVM Update is whether there is any difference among the approved products. A modest web-surfing effort indicates (with at least one credible direct comment) that they are not. It appears that one of them is available

in a lower concentration than the usual 37% concentration of formaldehyde, the active ingredient. This requires attention when making working dilutions for treatment. It appears that all 3 brands are made with approximately 10% methanol addition to prevent polymerization of formaldehyde into the more strongly toxic-for-fish compound paraformaldehyde.

The 3 approved products have different approved applications. This situation reflects the specific approvals that the chemical companies applied for, and what they conducted their tests upon. Two companies' products are approved for use against a variety of protozoan and trematode parasites on all finfish, for some protozoans on penaeid shrimp, and a common fungus infection on eggs of any finfish. The third is approved for a short list of fishes and fish eggs, and not at all for shrimp.

Another good question involves a major purpose of the reminders, which is to note that other brands and types of formalin are not approved. Why would a food fish producer consider using such products? Price and availability come to mind. Because the working concentrations for treatment are in the range 25-250 ppm, single uses in modest-sized containers don't require much product or expense, 2 to 10 drops per gallon. Aquarium stores sell non-approved brands in small amounts at relatively high unit prices, about \$5/ounce. One of the approved suppliers shows (thanks to Clyde Tamaru for the info) a price of \$85/gal, but cases of 4 gallons are offered for \$135, or a 55 gal drum for \$309. These prices are similar to those of suppliers of non-approved brands and forms. Note that the ADP reminder says that the state veterinarian has offered to help with access to approved products.

What's wrong with the products from non-approved sources? The CVM Update

says vague words about manufacturing standards, but large quantities of formaldehyde are made in the U.S. each year (for synthesis of many common building and other materials), essentially all by the same process. However, the purest grades of formalin from chemical companies don't have methanol added to prevent formation of paraformaldehyde. It appears as a precipitate when it does form, and it has not formed in some 3 year old jugs at a UH Hilo laboratory. Still, this shows that a farmer would need to know some technical detail to evaluate other products, and the farmer is therefore protected from some kinds of risk when using the approved brands. The best-managed businesses generally accept the professional advice they seek or pay for, and they also pay to minimize risks, for example by purchasing insurance coverage. In the unlikely event that a consumer or farm worker is harmed in any way, a farmer wouldn't want to have someone's lawyer examining the sources of all chemicals used on the farm.

Does any of this really affect fish after their parasites are killed? The FDA/CVM regulations say that there is no "withdrawal time" for formalin treatment, meaning that fish can be sold immediately. This suggests confidence that no residues are left behind on surviving fish after formalin treatment for external parasites. Therefore, the reminders are more about the regulatory regime than a technical discourse.

Also important, if we're discussing reminders, is that formalin requires caution during use and storage (it is rated flammable). Folks with biology lab or work experience remember the noxious smell and irritation of eyes and respiratory passages; some people are highly sensitive to these effects. Protective gear and ventilation are advised.

Reference: Francis-Floyd, R., 1996. Use of formalin to control fish parasites. (web site) edis.ifas.ufl.edu/BODY_VM061