



Letter from the Director

Aloha,

As we take time to reflect on all that we are thankful for this year, I would like to express my sincere appreciation to all of our industry stakeholders who help CTSA achieve annual goals, especially our Industry Advisory Council, Technical Committee, Board of Directors, and outside expert proposal reviewers.

In addition, I would like to thank our PI's (and their host institutions) who work hard to improve regional aquaculture through research, demonstration, and outreach activities. Just last week, several researchers, invited by Dr. Dong-Fang Deng, collaborated to host a wonderful workshop on "Local Feeds" at the Oceanic Institute of HPU. Presenters included representatives from Cyanotech and Big Island Abalone, as well as researchers from the University of Hawaii and Oceanic Institute of HPU. Presentations from the event are included in this issue.

Last but not least, I would like to announce that Dr. Maria Gallo of CTAHR has been appointed as the new Chair of the CTSA Board of Directors. Through this appointment, we look forward to enhancing our working relationship with CTAHR. Dr. Gallo will succeed Dr. JoAnn Leong, who will continue to advise CTSA to ensure that the program achieves the maximum contribution to industry development. On behalf of the Center, I extend our gratitude to both of them for their commitment to CTSA and regional aquaculture.

Mahalo,

Cheng-Sheng Lee

Executive Director, CTSA

In This Issue

Letter from the Director

'Local Feeds' Workshop at OI:
Highlights & Presentations

COM Half Pearl Seeding Training in
the Republic of Marshall Islands

November AquaClip

Quick Links

www.ctsa.org

www.oceanicinstitute.org

[Join our Mailing List!](#)

Highlights from the 'Local Feeds' Workshop at Oceanic Institute of HPU



"Local Feeds" Workshop Participants

On Friday November 21, the Aquatic Feeds and Nutrition Department at the Oceanic Institute of Hawaii Pacific University hosted a "Local Feeds" workshop to share new information from several ongoing CTSA aquatic feed development projects.

The workshop was attended by 32 farmers, researchers, and other industry stakeholders, who enjoyed presentations by researchers and representatives from Oceanic Institute of Hawaii Pacific University, University of Hawaii at Manoa, Cyanotech, and Big Island Abalone Corporation. The participants were also treated to an on-site demonstration of Near Infrared Spectroscopy (NIRS) technology ([click here](#) to read an in-depth article on NIRS, featured in the September 2014 issue of e-Notes).

[Click here to view/download the workshop presentations on the CTSA website.](#) You can also click on the individual presentation titles below to go directly to the respective PDF. *Please note: two of the seven presentations are summarized in this article because the information discussed is not yet finalized, and the full presentations are not available for public release.*

"Development of Practical Local Feeds to Support Sustainable Aquaculture in Hawaii and Other Pacific Islands"

Dr. Dong-Fang Deng, Aquatic Feeds and Nutrition Department, Oceanic Institute of Hawaii Pacific University

This presentation focused on work completed under a CTSA-funded project to develop aquatic feeds using ingredients found locally in Hawaii and the Pacific region. To date, the research team has analyzed several ingredients, such as cassava, breadfruit, macadamia nuts, and a variety of oils including algal oil and insect oil; in addition, four test diets have been developed and a feeding trial was conducted. Initial results found that fish meal from the Republic of the Marshall Islands, Spirulina, and Black soldier fly are good protein sources, and that cassava is a potential carbohydrate source for local feed production. In addition, black soldier fly and *Haematococcus* may provide potential minerals for tilapia feed. Furthermore, the feed trial found that the production efficiency of the diet formulated with 94% of local ingredients is 85% of the commercial feed, and that growth performance (except for the PER) is similar for the tilapia fed the local diet and the control diet. A significant part of the project has been the utilization of Near Infrared Spectroscopy (NIRS), which allows the research group to quickly and efficiently conduct raw material testing/analysis, product quality control, and processing monitoring; this technology was demonstrated to workshop participants as part of this presentation.

"Fortifying Yeast as Enrichment Diets for Live Feeds in Aquaculture"

Dr. Wei Wen Su, Dept. of Molecular Biosciences and Bioengineering, University of Hawaii'i, Manoa

This presentation discussed the current CTSA project to utilize a common aquatic feed ingredient (yeast) as an alternative source of nutritionally-important EPA and DHA in feeds for fish larvae. To

date, the research group has successfully enriched the *Yarrowia* yeast (chosen for a variety of factors) through a 4-step process that includes incubation with scrap fish oil to increase the level of HUFAs. Preliminary results indicate efficient uptake and storage of EPA and DHA from fish oil, and work is ongoing to further optimize the process and to conduct rotifer feeding tests using the enriched yeast. This work has potential to eventually create a locally produced, sustainable source of fish larvae feed.

"Utilization of Local Agri-processing By-products to Produce Fungal Protein for Aquatic Feed Production"

Dr. Samir Khanal, Dept of Molecular Biosciences and Bioengineering, University of Hawai'i, Manoa

"Commercial Production of Spirulina"

Dr. Gerry Cysewski, Chief Science Officer, Executive Vice President, Cyanotech

"Developing Local Diets for Hawaii Cultured Abalone with Normal Shell Color and Growth Performance"

Dr. Zhi Yong Ju, Aquatic Feeds and Nutrition Department, Oceanic Institute of Hawaii Pacific University

"Utilization of Locally Available Algae in the Culture of the Ezo Abalone in Hawaii"

Dr. Cecilia Viljoen, R&D Director at Big Island Abalone

"Opihi Aquaculture, Feeds"

Dr. Harry Ako, Dept. of Molecular Biosciences and Bioengineering, University of Hawai'i, Manoa

College of Micronesia Land Grant Sponsors Black-Lip Pearl Oyster Half Pearl Seeding Training Program in FSM and RMI

The following is an article written by Dr. Manoj Nair of the College of Micronesia Land Grant Program. The work described is the continuation of several years of CTSA-supported work to establish aquaculture of black-lip pearl oysters and sea cucumbers in Micronesia.

The College of Micronesia Land Grant Program (COMLG) conducted an aquaculture training program for three College of Marshall Islands Land Grant Aquaculture Program staff at the COMLG Nett Point Aquaculture facility in Pohnpei, Federated States of Micronesia (FSM) from August 27-30, 2014. The three staff, Tabwi Aini, Harry Langrine and John Zedkia, were trained under COMLG Master Technicians Mr. Belenko Halverson and Clayton Maluwelgiye, and supervised by COMLG Aquaculture Program Director and Chief Scientist, Dr. Manoj R. Nair.

The three Marshallese candidates were taught hands-on Black-Lip Pearl Oyster Half Pearl seeding of oysters, post seeding handling and care at the COMLG Aquaculture facility in Nett Point in Pohnpei, FSM. In addition, the candidates also had an opportunity to witness and participate in Sandfish (*Holothuria scabra*) Sea Cucumber nursery and grow-out experiments being done at the Nett Point facility and in the community.

The COMLG team, consisting of Dr. Manoj R. Nair, Mr. Belenko Halverson and Clayton Maluwelgiye, travelled to Majuro, Republic of the Marshall Islands (RMI) and conducted an onsite training from September 28-October 3, 2014 for 11 candidates from seven Atolls of RMI, namely Majuro, Likiep, Ebon, Aur, Maleolap, Nandrik and Ailinglaplap. The candidates were taught the basics of pearl farming and had hands-on training in half pearl seeding of oysters, as well as post seeding handling and care at the CMI Land Grant aquaculture facility at CMI Arrak



The COMLG team plans to conduct a return visit to RMI after six months to assess the training program by harvesting the half pearls seeded by each trainee and give recommendations based on the results.

The COMLG wishes to thank Dr. Hilda Heine, Chairman Board of Regents College of Micronesia Land Grant Program, for taking active interest in the training program. Thanks are also due to Dr. Singeru Singeo, Executive Director of College of Micronesia Land Grant Program, for funding support and valuable inputs for the training program. The trainers also would like to acknowledge Mr. Carl Hacker, President, of College of the Marshall Islands and Mr. Biuma Samson, Dean, College of Marshall Islands Land Grant Program for all the necessary help rendered for the smooth running of the training program in RMI. The COMLG wish to thank Mr. Eltera Hermius for graciously agreeing to attend and chair the closing ceremony at CMI Arrak Campus in Majuro and for distributing the certificates of completion to the trainees.

AquaClip ~ FAO increases growth projections for aquaculture

by Aquafeed.com staff. November 17, 2014

Fish farming will likely grow more than expected in the coming decade, offering a chance for improved nutrition for millions of people, especially in Asia and Africa, according to a new report. Increased investment in the aquaculture sector - particularly in productivity-enhancing technologies including in the areas of water use, breeding, hatchery practices and feedstuff innovation - should boost farmed-fish production by as much as 4.14 percent per year through 2022, notably faster than the 2.54 percent growth forecast made earlier this year in a joint report by FAO and the Organization for Economic Cooperation and Development.

"The primary reason for increased optimism is that there is ample room for catching up with more productive technologies, especially in Asia, where many fish farmers are small and unable to foot the hefty capital outlays the industry requires to expand output without running into resource constraints," said Audun Lem, a senior official at FAO's Fisheries and Aquaculture Policy and Economics Division and one of the lead authors of the 120-page report.

Africa, with formidable water resources, should also host ongoing rapid growth of more than 5 percent a year, the fastest in the world but building on a very low current base level, according to the report.

Aquaculture is a young industry compared to livestock farming and has grown from virtually nothing in 1950 and to a record production of 66.5 million tonnes in 2012, up almost thirty-fold since 1970. About 50 percent of the \$127 billion in global fish exports in 2011 came from developing countries, which receive more net revenue from the fish trade than from their exports of tea, rice, cocoa and coffee combined, Lem said.

In terms of direct human consumption, farmed fish in 2014 surpassed captured fish, which reached a plateau in the mid-1980s and is expected to grow only 5 percent over the next decade, thanks largely to reduced waste as well as better gear reducing unwanted bycatch and improved fisheries management.

[Click here to read the full article on aquafeed.com.](#)

The Center for Tropical and Subtropical Aquaculture (CTSA) is one of five regional aquaculture centers in the United States established and funded by the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA) under grants 2008-38500-19435, 2010-38500-20948, and 2012-38500-19566. The regional aquaculture centers integrate individual and institutional expertise and resources in support of commercial aquaculture development. CTSA was established in 1986 and is jointly administered by the Oceanic Institute and the University of Hawaii.

[Forward email](#)



This email was sent to mbrooks@ctsa.org by mbrooks@ctsa.org | [Update Profile/Email Address](#) | Rapid removal with [SafeUnsubscribe™](#) | [Privacy Policy](#).



Center for Tropical and Subtropical Aquaculture | 41-202 Kalaniana'ole Highway | Waimanalo | HI | 96795