

# REGIONAL NOTES

CENTER FOR TROPICAL AND SUBTROPICAL AQUACULTURE

## ***Hawaii Pacific University hooks up with The Oceanic Institute***

On June 9, 2003, Hawaii Pacific University (HPU) and The Oceanic Institute (OI) signed a contract of affiliation that will realize both organizations' goals of expanding their scientific and educational programs in marine aquaculture, biotechnology, and marine environmental science. Their aim is to establish a leading global center for research and education in these fields. The mutually beneficial partnership will take effect on July 1 and is not expected to affect any existing or future partnerships OI or HPU have with other institutions. This includes OI's collaborative relationship with the University of Hawaii.

The contract will create more opportunities and options for both organizations while still allowing them to retain their separate identities. HPU is the state's largest private university, and OI is an independent not-for-profit research organization. The reciprocal relationship will allow HPU students and faculty to conduct research using OI's facilities and will allow OI's scientists to teach at HPU and involve students in their research when possible. It will enable HPU to expand degree and certificate programs in the marine sciences, building upon its small, but first-rate undergraduate program in that discipline. Both organizations will now be eligible for a much broader scope of funding opportunities that will benefit the state and attract leading researchers.

The financial portion of the arrangement involves HPU providing \$1 million a year to OI for ten years plus an endowment of at least \$10 million within ten years. In terms of organizational structure, HPU President Chatt Wright will serve as Chairman of

the OI Board of Trustees, and OI President and CEO Thomas Farewell will serve as an ex-officio member of HPU's Board and as an Executive Vice President of HPU.

Effective and timely technology transfer is essential for industry growth, and as Farewell pointed out, the contract will help OI strengthen its education and training programs, "thereby enabling a broader dissemination of the marine science and aquaculture technologies developed by our scientists." One of the buildings currently under construction at OI's 56-acre Makapuu location is envisioned to become an educational hub. This Information Technology and Training Facility (ITTF) will facilitate hands-on training for farmers, teachers, and students. This will directly enhance development of a skilled workforce in Hawaii to support technology development.

Some of the collaborative efforts projected to occur as a result of the contract already take place on a small scale. For instance, Shaun Moss expends the majority of his brainpower and energy as OI's Director of Shrimp Technology, but devotes a good amount of the same to HPU as an Associate Professor of Biology. He usually teaches one evening class per semester. Despite his busy schedule, he finds both roles to be fulfilling. From his vantage point, he views the OI-HPU affiliation as an optimal way for both to take advantage of the other's areas of expertise. He explained that "OI excels at research and grant administration, and HPU excels at education and marketing."

***Continued on page 3***



*Hawaii Pacific University  
photo courtesy of HPU*



*Chatt Wright and Thomas Farewell  
photos courtesy of OI*



*The Oceanic Institute*

## Letter from the director



The middle of summer is an interesting time for CTSA as we look forward to the start of our new projects and continue the process of developing proposals for the following funding cycle.

One improvement that I would like to recognize involves project duration. Project principal investigators are increasingly completing projects in a more timely manner, and I commend them for this. We are well aware that research results need to reach users as soon as possible. CTSA strongly discourages projects from extending beyond 18 months. For this reason, an additional no-cost extension requires approval from the Board of Directors.

We could further shorten the length of time between research funded and technology transferred by spending less time determining what the industry's most pressing problems are. Our Industry Advisory Council members represent various sectors as best they can, but they need your feedback. Help us to help you!

*Cheng-Sheng Lee*



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# AQUA CLIPS

### **New research lab will focus on creative feed production**

*By Kristen Sawada, Pacific Business News - Friday, April 11, 2003*

One man's trash is another man's treasure. That's what the folks at the Oceanic Institute aim to prove at a new agriculture and aquaculture feeds-research lab planned for the Big Island. The Oahu-based nonprofit that does research and development in aquaculture, environmental science and marine biotechnology will launch the first phase of a \$7 million project next year, partnering with the University of Hawaii at Hilo to create a feeds research lab and pilot production facility in Panaewa, outside of Hilo. A major focus will be researching and producing new feeds for aquatic and terrestrial animals, including swine, poultry and cattle, using agricultural byproducts and waste products such as off-grade macadamia nuts, papaya and coffee pulp, said Warren Dominy, an Oceanic Institute scientist. The first phase of construction will begin next year with a 2,600-square-foot laboratory expected to be completed in 2005.

### **Leading nutrition scientist joins Oceanic Institute**

*The Oceanic Institute press release - Monday, April 28, 2003*

Dr. A. Reza Kamarei has joined the Oceanic Institute as the Director of Nutrition. In this capacity, Dr. Kamarei will expand the Institute's research on marine shrimp and fish nutrition to include the nutritional benefits to humans of consuming aquacultured seafood and seafood products. Dr. Kamarei and his team will develop innovative feed, food, and nutrition technologies for application by the aquaculture and associated industries.

### **Healthier shrimp may mean jumbo profits for the University of Hawaii and one local company**

*By Kate Wester, UH News - Monday, April 28, 2003*

The University of Hawai'i and Genentex, a biotechnology company founded to commercialize a proprietary university aquaculture technology, have established their first joint venture. Genentex has exclusively licensed a gene transfer technology the university has been developing for several years and in turn, UH will own equity in the newly formed company. . . . Based on UH's unique gene transfer technology, UH and Genentex are developing methods to make a variety of shrimp species resistant to viruses that cost the industry billions of dollars every year. Genentex believes that its proprietary gene transfer technology will revolutionize shrimp farming by eliminating disease, lowering operational costs, and helping the environment. Genentex will license these technologies to major agribusinesses and governments as well as to large shrimp farms and hatcheries.

### **Aquaculture options discussed**

*By Scott Radway, Pacific Daily News - Tuesday, May 27, 2003*

KOROR, Palau - Despite the current domination of the aquaculture industry by large Asian countries, regional experts believe Pacific islands can use their diverse and healthy environments to find niches in the growing marketplace. Pointing to the success of the black pearl industry in French Polynesia—which netted \$170 million in sales last year—Simon Ellis of Mid-Pacific Marine Consultants in Pohnpei said the opportunity is there if matched with aggressive marketing to get the product sold abroad. Ellis said at a seminar here last week the pearl industry allowed French Polynesia to provide economic opportunities, even on far-flung atolls. Pohnpei, a state in the Federated States of Micronesia, is following suit with a fledgling pearl farm on Nukuoro Atoll, 200 miles south of the main island. The farm already employs six people and has made a modest profit because pearls allow easy shipping: They can fit in one suitcase, he said. Ellis explained small island nations are up against the cost of shipping that leaves them unable to compete head-to-head with large Asian nations when exporting seafood, such as tilapia and milkfish. But in specialized markets that have higher yield upon export, islands can see profits.

## UPDATE



### **CTSA Year 17 pre-proposals in review:**

CTSA received fourteen pre-proposals in response to the twelve priority areas identified by the Industry Advisory Council (IAC). The IAC and the Technical Committee are currently reviewing the pre-proposals and will soon determine which ones will become full proposals.

### **CTSA PRAISE and Publications projects to join forces:**

In Year 17, the Library Aquaculture Workstation, also known as the Pacific Regional Aquaculture Information Service for Education (PRAISE), will begin working more closely with CTSA's Publications project to better coordinate efforts for improving information dissemination throughout the CTSA region. The Board of Directors viewed this collaboration as a logical step toward maximizing resources and streamlining the proposal review process.



## CTSA wants to hear from you!

CTSA welcomes your feedback and suggestions for articles for future issues of the Regional Notes. If you would like to advertise an event or share interesting aquaculture-related news with the rest of the CTSA region, please contact the editor at: [dsasaki@oceanicinstitute.org](mailto:dsasaki@oceanicinstitute.org).



## HPU hooks up with OI cont'd from page 1

HPU students have also done work at OI, and the affiliation will give more students the chance to gain "real-world" experience. Moss occasionally brings his students to OI to do school projects and assist technical staff. He said students get a much better understanding of science when "theoretical lecture material is reinforced with hands-on experience." OI Research Assistant Komarey Moss knows exactly what he means. She is a graduate of HPU's Marine Sciences program and conducted her senior research project "Effects of Artificial Substrate on the Nursery Production of Pacific White Shrimp *Litopenaeus vannamei*" at OI under the guidance of none other than project advisor Shaun Moss. Komarey similarly described the process as "an effective means of bridging what I learned in class with practical research experience." Despite sharing the same last name, the two are not related.

In addition to working at OI, Komarey is currently pursuing a Master's Degree in education. She spent her student teaching segment at Kamehameha Schools where she taught a one-month unit on aquaculture. She said, "The students were really intrigued and enjoyed all the different aspects of the subject." Upon graduating at the end of this year, she expressed an interest in teaching aquaculture because "it is so important for students, especially in Hawaii, to learn about conservation and preserving our natural resources." In addition to her research background, she also has experience in the commercial sector.

If the Moss success stories are any indication of what could develop from offering similar opportunities to other students, scientists, and professors, then the future looks especially promising. U.S. Senator Daniel Inouye said the affiliation "will further Hawaii's stature as a global center for research and education in aquaculture, biotechnology, and the marine sciences," as well as inspire local and visiting students "to enter a variety of science fields, even as entrepreneurs of the technologies developed." 🐟

## Fish feeds manufactured in Canada barred from U.S.



On May 20, 2003, following the confirmation of a single case of bovine spongiform encephalopathy (BSE) or "mad cow" disease in Alberta, the USDA instituted a temporary ban on all ruminant animals (such as cattle, goats, or sheep) and ruminant products from Canada. The list of products includes "processed animal protein, regardless of species of origin" and "animal feed."

Despite the low risk for contamination, aquatic animal feeds are among the products prohibited to enter the country. Fish feed consists primarily of fish meal, but some varieties may also contain ruminant by-products. The U.S. government is taking every precaution to protect the country from BSE during these early stages of the investigation. BSE has never been found in the U.S. It is believed that people who eat infective products from animals with BSE could contract variant Creutzfeldt-Jakob disease, a fatal neurodegenerative condition.

Clayton Lee of local feed company Land O' Lakes said that in terms of fish feed, the one brand the company imports from Canada makes up quite a bit of its market share. However, it is too soon to determine how the ban will affect business. There are comparable domestic products, but some Hawaii companies prefer the Canadian brand because of its high quality.

With the support of countries such as the U.S. and the U.K., the Canadian government is working as quickly as possible to address the problem. The diseased cow did not enter the food chain, and every effort is being made to systematically inspect the industry for any other traces of the disease. In a statement to the House of Commons on May 26, Canada's Agriculture and Agri-Food Minister Lyle Vanclief said, "Anything that we need to do is already underway." 🐮

# AQUA TIPS

## Aquaculture extension agents absorb new techniques and ideas at national conference

Jim Szyper

University of Hawaii Sea Grant Extension Service, Cooperative Extension Service, and  
Hawaii State Department of Agriculture Aquaculture Development Program

*This article was written as part of the work for the project, "National Aquaculture Extension Conference," which was funded by the Center for Tropical and Subtropical Aquaculture under a grant from the U.S. Department of Agriculture Cooperative State Research, Education, and Extension Service.*

### Introduction

CTSA, along with the other four USDA Regional Aquaculture Centers (RACs) and the NOAA National Sea Grant College Program, sponsored the third National Aquaculture Extension Conference. It was held during the week of April 7-11 at the Marriott Hotel next to the scenic campus of the University of Arizona in Tucson, which served as the host institution. This is the first time this conference has had National Sea Grant sponsorship, which is important because both NOAA Sea Grant and USDA are major players in U.S. aquaculture development.

CTSA, like the other RACs, contributed financial support to the conference, as well as supported the travel expenses for the author, for CTSA Director Dr. Cheng-Sheng Lee, and for David Crisostomo of the University of Guam, an important institution in CTSA's region of responsibility. I presented a poster titled, "Aquaculture Extension in Hawaii," that showed the great diversity of products, culture systems and businesses, and extension activities we have in the state.

The two previous conferences were held in Little Rock, Arkansas in 1992 and in Annapolis, Maryland in 1997. These sessions, "stimulated the development of a national extension network that has played an important role in supporting U.S. aquaculture." A detailed rationale for the further development of this network and for new efforts to improve extension support of aquaculture development in the U.S. is summarized below and is part of the background material posted on the conference website (<http://ag.arizona.edu/azaqua/extension/National/extensionconf.html>). The site also provides the abstracts and PowerPoint slide shows from the presentations at this conference. The abstracts are also available on CD-rom.

Most of the sessions during the two days of individual presentations were "plenary," that is, intended for the entire international group of about 100 participants. Some sessions,

however, were concurrent, and no one person could attend them all. There was another day on which five half-day workshop sessions were presented concurrently during both the morning and afternoon. Each participant could choose to attend two of them. Finally, the last day offered a choice of one of three tours to fish and shrimp farms or to the Arizona-Sonora Desert Museum and the BioSphere 2 ecosystem.



### Extension and Aquaculture

Extension service is an agricultural tradition in which professional agents and specialists bring information derived from university-based research to farmers in a timely and useful manner and bring the needs of the user group to the attention of researchers. Aquaculture is one of the most rapidly growing and diverse sectors of U.S. agriculture. It has large, diverse, and rapidly changing needs for extension services.

The Background section of the conference website details the dynamic role of extension in U.S. aquaculture as follows:

- The rapid diversification into a large number of species and production systems has led to increased demand for information from existing and potential producers, government agencies, educators, and consumers. Questions regarding the environmental impacts of certain aquacultural practices has further stimulated demands for science based information.
- Several important new issues are impacting aquaculture in the U.S. including: new regulations from EPA, consideration of new legislation on drugs for "Minor Use and Minor Species," and defining "organic standards" for aquaculture products.
- Nationally, aquaculture is a diverse business that involves numerous disciplines in the production of food and non-food items.
- The Web has completely changed how information is distributed to clientele. Rapid dissemination of information critical for private industry decisions is becoming more important in today's competitive world.

## Find conference abstracts and presentations at:

[http://ag.arizona.edu/azaqua/extension/  
National/extensionconf.html](http://ag.arizona.edu/azaqua/extension/National/extensionconf.html)



- The U.S. is a leading nation in aquaculture research and development, therefore, it is critical that new discoveries and knowledge reach potential beneficiaries as quickly as possible. Effective networking of extension professionals with a common vision of benefiting private sector development is an important element for continued and future success.
- Growing interest in vocational education with aquaculture as a component has led to establishment of numerous programs across the U.S.
- The role of *extension education* within the RAC Program is evidenced by the realization of the need for an effective extension component in most, if not all, RAC funded projects.
- While Land Grant and Sea Grant agents and specialists work together in some parts of the nation, this is not the case in all areas. Linking these organizations can only result in the whole being far stronger than the sum of the parts.

The conference aimed to address these needs and concerns, as well as several categories of information that were prioritized by participants at the previous conference.

### Highlights

The rest of this article consists of selected highlights of presented topics, aiming to show the diversity of the information and to pique the interest of readers. Material in quotation marks comes from actual presentation text or slides.

#### The Nature and Conduct of Extension Work

- Here is an update of the statistics often quoted about the importance of aquaculture: it “. . . contributes nearly 40% of world seafood supplies, valued at \$56 billion . . . U.S. imports \$10 billion, or 2/3 of seafood supply.” U.S. production of both freshwater and marine species can expand.
- Environmental issues are rapidly gaining public attention; public advocacy is increasing, particularly in opposition to some aquaculture activities. Professionals must be well-informed and prepared to answer criticism. A recent survey of aquaculture extension professionals shows that they agree in great majority that extension “should provide an important role and contribution on public policy issues.” Also, “Extension of environmentally compatible technology and management information is becoming ever more important for coastal extension agents.” Sea Grant programs support many such agents nationwide, who do not necessarily specialize in aquaculture.
- Department of Commerce (the home of NOAA/Sea Grant) “aquaculture policy of 1999 calls for a five-fold increase in U.S. aquaculture production and a three-fold increase in jobs.” [Author’s note: Jobs and business development are the main rationale for the aquaculture extension service in Hawaii, which is supported by UH Sea Grant, the state Aquaculture Development Program, and other partners.]

- Extension agents and specialists should see themselves as “agents of change,” as the model of effectiveness and impact used by USDA and others demands. Continual effort for learning is necessary. [Author’s note: This explains why so many aquaculture extension professionals were away from their desks and telephones during the week of the conference, but we hope that the clientele will soon receive the benefits.]

#### Aquaculture and Teaching

There are major efforts and programs in several states that aim to develop materials and techniques to help teachers teach aquaculture, as well as to use aquaculture as a high-interest context for teaching science in general. The University of Arizona program, “Aquaculture in the Classroom,” was given to all participants on CD-rom.

The Aquaculture Network Information Center (AquaNIC - <http://aquanic.org>) is “the gateway to the world’s electronic resources for aquaculture information and education.” Last year, the site was accessed by 1.2 million visitors from more than 140 countries. Its “Future Directions” include:

- “Development of online instruction for K-12, university, and adult learners.”
- “Convert the Web from a source of information to a source of instruction.”

#### Technical Developments and Their Extension Contexts

- The paper, “Recirculating Systems, What’s Going On?” points out that many systems have been too intensive, and thus expensive, to contribute to a business’ profitability. This subject is near and dear to the hearts of the author and his colleagues in Hawaii. We have some inexpensive systems that potential users can see and duplicate and we will synthesize the information some time soon.
- Offshore aquaculture: a University of Miami team reported exciting developments from the project off Culebra, an island near Puerto Rico, which is working toward production of cobia and snapper in cages like the ones used for moi in Hawaii. This work is a complex partnership among governments, universities, and private sector companies. CTSA was a major supporter of offshore cage culture development in Hawaii, which has now gone to the commercial stage.

The third day consisted of half-day sessions, with each participant able to attend two out of the five workshops offered:



*Conceptual offshore sustainable aquafarm*

## HAA conference brings industry together for information exchange

It's tough to stay competitive in Hawaii's aquaculture industry, and businesses often instinctively hold their cards close to their chest to hang onto any edge they may have. However, the importance of working together was emphasized at the Hawaii Aquaculture Association's (HAA) fifth annual conference on Wednesday, May 7, 2003, at Windward Community College. Guest speaker Chef Sam Choy fittingly said, "Everybody's in the same boat." Government, farmers, researchers, and chefs alike all need to help each other.

More than 100 people attended the conference, which was divided into four sessions. In the opening session, representatives of the conference co-sponsors and other key organizations gave institutional overviews. Session two covered basic and advanced aquaculture topics. Session three focused on cutting-edge technologies for emerging aquaculture species such as kahala, feather dusters, and sturgeon. Finally, session four summed up strategies that aquaculture businesses should employ.

Some of the key advice given was to keep product size and quality consistent, find niche markets, and diversify when times are good. Although aquaculture can be a frustrating and difficult business, Linda Koch of Mokuleia Aquafarm said, "If you aren't having fun, you're doing something wrong."

HAA is celebrating its tenth anniversary this year, and there is much to look forward to as the association continues to grow and evolve. The familiar moi logo may soon be replaced by a more representative one in time to be prominently displayed on all Aquaculture 2004 conference material. HAA has the honor of hosting the international conference next March, which will be held in Honolulu. HAA President Ron Weidenbach requested everyone's support in preparing for this big event. HAA also recently launched its own website at [www.hiaqua.org](http://www.hiaqua.org) where members can advertise their businesses free of charge.

The HAA Conference concluded with the "Taste of Hawaii Aquaculture" reception, which featured farm-raised products prepared by some of Hawaii's top chefs. 🦀

"Everybody's in the same boat."

--Chef Sam Choy



## A Taste of Hawaii Aquaculture

(From L to R) the Oceanic Institute's Charles Laidley, David Vaughan, and Robin Shields enjoy the food and fellowship.



photo: C. Tamaru



photo: C. Tamaru

HAA President Ron Weidenbach



Chef Henry Holthaus and his crew from the Kapiolani Culinary Institute fried up **moi** from **Cates International** and **shrimp** from **CEATECH**.

Indigo Restaurant's Chef Glenn Chu prepared **tilapia** from Lita Weidenbach's farm **Hawaii Fish Co.** and featured **abalone** from **Big Island Abalone** in another dish.



Chef Chu created bite-sized towers of rice using sections of PVC pipe, a material very familiar to aquaculturists.

Haleiwa Joe's Chef Dan York prepared **moi** from Cates International and **shrimp** from **Kahuku Shrimp Co.**



(From L to R) Harry Ako (University of Hawaii), Clyde Tamaru (Sea Grant), Dave Bybee (UH), and Jim Szyper (Sea Grant) smile for the camera.

## Aquaculture ext. cont'd from page 4

- "Remote Training and Other Computer Applications"
- "Education in the Classroom"
- "Recirculation Systems"
- "Recent Developments and Trends in Pond Aquaculture"
- "Introduction to Aquaculture Pathology"

The fourth day offered a choice of one of three tours:

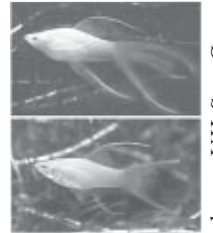
- Shrimp farms in western Arizona
- Fish farms in central Arizona
- The Arizona-Sonora Desert Museum and the BioSphere 2 ecosystem



It is well known to conference participants worldwide that some of the greatest benefits derive from the opportunities, both planned and unplanned, to meet and speak with other participants. This conference was especially good in that way because the participants shared a more specific interest than is true at most conferences, such as those of professional societies. The conference was a valuable experience for the author, who obtained a design for an inexpensive fluidized-bed sand biofilter from a new colleague, among many other items of information and inspiration. We hope that the conference materials will be helpful to our clients, colleagues, and to the extension mission in Hawaii. 🐟

## New publication available

Sea Grant Extension Agents Kathleen McGovern-Hopkins and Clyde S. Tamaru along with Glenn Takeshita and Mike Yamamoto have released their handbook: *The Procedural Guide for the Artificial Insemination of the Lyretail Swordtail, Xiphophorus helleri*. This publication is part of the CTSA project, "Transitioning Hawaii's Freshwater Ornamental Aquaculture Industry." Other supporters of this book include the University of Hawaii Sea Grant College Program and the State of Hawaii Department of Agriculture Aquaculture Development Program.



Lyretail swordtails

photo: UH Sea Grant

For copies of the handbook please contact Debra Sasaki at: dsasaki@oceanicinstitute.org.

The research of Dr. Tamaru and team was also featured in the magazine, *Tropical Fish Hobbyist*. The article "Creating the Homozygous Genotype for Lyretail Swordtails" appeared in the May 2003 issue.

Congratulations to the researchers for their excellent work.

## International Sustainable Marine Fish Culture Conference and Workshop

October 9-10, 2003  
Fort Pierce, Florida



Aquaculture Division  
Tel: 1-772-465-2400 x 416  
Fax: 1-772-466-6590  
Email: mnaranjo@hboi.edu

Early registration deadline:  
September 15, 2003

[www.aquaculture-online.org/conference](http://www.aquaculture-online.org/conference)

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# CENTER FOR TROPICAL AND SUBTROPICAL AQUACULTURE

The Center for Tropical and Subtropical Aquaculture (CTSA) is one of five regional aquaculture centers in the United States established by Congress in 1986 to support research, development, demonstration, and extension education to enhance viable and profitable U.S. aquaculture. Funded by an annual grant from the U.S. Department of Agriculture's Cooperative State Research, Education and Extension Service (USDA/CSREES), the centers integrate individual and institutional expertise and resources in support of commercial aquaculture development.

CTSA currently assists aquaculture development in the region that includes Hawaii and the U.S.-affiliated Pacific islands (American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, Guam, Republic of Belau [Palau] and the Republic of the Marshall Islands.)

In its fifteen years of operation, CTSA has distributed over \$7

million to fund more than 161 projects addressing a variety of national aquaculture priorities.

Each year, the Center works closely with industry representatives to identify priorities that reflect the needs of the aquaculture industry. After consultation with appropriate technical experts, CTSA responds with a program of directed research with objectives that focus on these industry priorities. The Board of Directors is responsible for overseeing the programmatic functions of CTSA. Results of CTSA projects are disseminated through its print publications, hands-on training workshops, and Web site.

CTSA is jointly administered by The Oceanic Institute and the University of Hawaii and is located at The Oceanic Institute's Makapuu Point site on the island of Oahu in Hawaii.

For further information, contact Cheng-Sheng Lee, Ph.D., Director, by phone (808-259-3107), fax (808-259-8395) or email ([cslee@oceanicinstitute.org](mailto:cslee@oceanicinstitute.org)).

## FAST FACT

*In 2000 China, "produced 71 percent of the total volume and 49.8 percent of the total value of aquaculture production."*

*-- UN Food and Agriculture Organization*

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