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Student Ambassadors Gain Leadership Experience

By Kirsten Compton

As a student ambassador for the University of Arizona College of Agriculture and Life Sciences (CALS), Katy Groseta visits high schools across the state to talk about CALS programs.

"I have had the opportunity to speak with students in rural communities who felt they had no chance of ever attending college and help them to realize that a college education is possible," says the animal sciences junior.

Along with 36 other CALS students, Groseta volunteers her time in an organization that focuses primarily on recruiting new students. The group has grown since its inception in 1992, when former associate dean Dave Shoup decided to launch a group of 10 students who would act as young recruiters for the college. They serve as examples of what the college has to offer, and encourage others to enroll in CALS.

"Ambassadors are chosen based on their demonstrated qualities of leadership, tenacity, and initiative," says Jack Elliot, professor in the Department of Agricultural Education and advisor to the CALS Ambassadors. An application, interview and a minimum 3.0 grade point average are required for undergraduate applicants to be considered for acceptance as CALS Ambassadors. Ambassadors can be freshmen, sophomores, juniors or seniors.

CALS Academic Programs

The 2003-2004 CALS Student Ambassadors

"We can relate to students," says ambassador Mike Gaspar, senior in agricultural education. "We are the student voice for the college."

Ambassadors visit high schools once or twice a month. While at the school, the CALS students set up displays during lunch hours, at career fairs and in classrooms. They speak with younger students about CALS and the opportunities that are available to help pay for higher education.

Unlike other leadership groups, CALS Ambassadors are not scripted during their presentations. Students are given themes to use during the recruiting but not a set guideline for what to say during the visits.

"I want their individuality to emerge," Elliot says.

The group's 22 annual activities, funded by the CALS Office of Academic Programs, include not only the high school visits, but also participation in the National Agriculture Ambassadors Conference at California Polytechnic Institute, the University of Arizona's homecoming and various CALS events on and off campus. At official functions the group wears khaki pants and matching collared shirts in blue, red, white, or all three, depending on what is selected for each academic year.

Unlike the other 30 clubs in CALS, the CALS Ambassadors organization has no officers. Each student is placed on one of five committees: ambassador operations, FFA, off-campus recruiting, off-campus events or campus activities. Because the number of ambassadors has nearly quadrupled in 13 years, the current practice is to replace only the ambassadors who graduate, so the number of new members fluctuates from year to year. The group strives to have a student representative from each department in the college.

The ambassador experience offers more than a chance for CALS students to recruit others. It's also a chance to develop skills that will prepare CALS graduates for future careers.

"A metamorphosis takes place–students' leadership skills and public speaking skills become fine-tuned in ambassadors," says Bobby Browning, coordinator for career and multicultural activities and academic programs in CALS. "Real leaders are developed in this program. And the ambassadors realize that there are careers in the agricultural industry."

In addition, past ambassadors have gone on to be surgeons, nutritionists, teachers and extension agents.

"I currently do applied research and educational programming in agriculture, natural resources and youth development," says Dean Fish, past ambassador and current Santa Cruz County Extension director. "Ambassadors really reinforced the foundation for what I do today."

For more information contact Jack Elliot (520) 621-1523, or visit the website at cals.arizona.edu/OAP/ambassadors.

Spring 2004 Issue Highlights

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cals.arizona.edu/landandpeople

NEW CALS PUBLICATIONS

Cacti, Other Succulents and Unusual Xerophytes of Southern Arizona

M. Johnson

This pocketsized field guide, published by the Boyce Thompson Southwestern Arboretum, features 83 species of cacti and other succulent plants that can be found in southern Arizona. One or more color photographs illustrate each plant in its natural habitat, and many include closeup images of the flowers.

The book is organized with related plants located on consecutive pages to facilitate identification. The text lists both scientific and common names. Information on habitat and distribution of each species is provided along with a brief, nontechnical description, flowering times, interesting facts about the plants and useful tips on distinguishing similar species. The price is $9.95.

The BEST Exercise Program for Osteoporosis Prevention

The Bone Estrogen Strength Training (BEST) study, funded by the National Institute of Health, identified the six exercises that are the most effective for preventing osteoporosis and improving bone mineral density in postmenopausal women. Authors include researchers from the University of Arizona College of Public Health and the College of Agriculture and Life Sciences: Timothy Lohman, Scott Going, Linda Houtkooper, Lauve Metcalfe, Terri Antoniotti-Guido and Vanessa A. Stanford. The book features the six exercises, training protocols, and specific programming and motivational strategies to help women adhere to a lifetime of exercise for bone health. Geared toward the health professional, the text discusses general information on osteoporosis; osteoporosis screening measures; the relationship between exercise and osteoporosis prevention; the BEST exercises; the BEST intervention and support program; nutrition and bone health; and medical intervention for osteoporosis. The book costs $37.

These publications can be obtained through CALSmart online:
cals.arizona.edu/calsmart.

University Distinguished Professor Dennis Ray Makes Significant Impact

By Susan McGinley

M. Hartshorn

As a University Distinguished Professor, Dennis Ray is honored for his longstanding and continued record of excellent contributions to undergraduate teaching over more than two decades, not only in the classroom, but also through his involvement in the university-wide general education program. He is a professor of both plant sciences and arid lands studies in the College of Agriculture and Life Sciences.

According to his colleagues, Ray has had a powerful and positive impact on the quality of the general education program and on academic advising. He has worked with faculty at all three Arizona universities and at Arizona's community colleges in the statewide articulation effort, and in the assessment of the quality of the University of Arizona's general education curriculum.

"I've always been very committed to teaching," says Ray, whose research focuses on the development of new crops such as guayule, guar and lesquerella for arid and semi-arid regions. "I think the next generation of students needs to know how important plants are to us so they can make informed decisions. They need to know where their food comes from, who grows it, and how plants in general are important in our lives."

In the classroom, this translates to steady attendance that does not decline through the semester, students say, because Ray's dedication as a teacher, tutor, mentor and scholar keeps them coming back.

"He has a gift for making incredibly complex scientific concepts appear simple and straightforward," says a former student who is now a doctor at the Yale University of Medicine.

"Dennis' success as a teacher is not just his ability to present interesting and clear lectures, but he also has the unique ability to motivate students to want to study and learn," adds Robert Leonard, head of the plant sciences department. "His knack for engaging students in learning is really special."

Beyond the classroom, Ray serves as a faculty fellow for students at Cochise Hall, speaks at various colloquia, offers student advising workshops, and is active in student honorary societies. He has mentored a large number of graduate assistants and undergraduate preceptors.

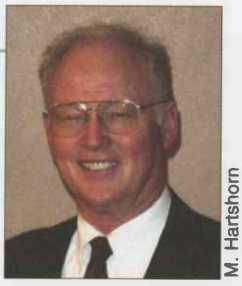
Ray's numerous other awards include the Honors College Five Star Faculty Award for Outstanding Teaching; his election as a Fellow in the American Society for Horticultural Sciences; the UA Provost General Education Teaching Award; the College of Agriculture Faculty Teaching Award, and many other national and international honors.

Yet he says his own accomplishments are not what is most important to him.

"Most significant would be some student I have reached who will do something great someday." ■

Ralph Price's All-Around Dedication Earns Recognition

By Susan McGinley



M. Hartshorn

Since 1976, thousands of students have taken Ralph Price's nutritional sciences course, NATS 104: Food, Nutrition and You. Filled with multimedia presentations, hands-on projects, and practical information, it has become one of the most popular of the general education biological science Tier 1 classes at the University of Arizona, garnering consistently high ratings from students.

Price, a professor in the nutritional sciences department of the College of Agriculture and Life Sciences, is the honored recipient of the 2003 Provost's General Education Teaching Award. In his nomination packet, colleagues and students alike note his enthusiasm, organizational skills, knowledge and love of his subject, deep appreciation for undergraduate students, and dedication to mentoring others as a "teacher's teacher." He has won five other teaching awards.

Price leads the team of faculty, graduate assistants and student preceptors that delivers NATS 104 to more than 2200 students annually. With 500 students in each class, it is a tremendous undertaking to keep the course fresh. To hold interest, Price incorporates current songs—he once sang a duet with a football player, and brings cartoons and images into the class sessions to convey serious nutritional information in an entertaining way.

"I ask questions to at least awaken them," Price says. "I like to get the students to relate their bodies and nutrition with what they're eating." Students assess the nutrient content of their actual diets over a three-day period, do nutritional case studies, and learn about the effects of various diets, pregnancy and lactation, physical fitness, anorexia and bulimia, and alcohol on the body.

"As a consequence of exposure to NATS 104, we have also seen a steady increase in the numbers of students transferring into our major programs of study," says Linda Houtkooper, nutritional sciences department head. "This is a direct result of Dr. Price's influence in the classroom."

During his 35 years at the UA, Price has also directed the Better Process Control School, delivering his food safety certificate program to more than 5,000 enrollees. He is an elected Fellow of the Institute of Food Technologists, one of only twelve individuals honored annually nationwide. Fluent in Spanish and Portuguese, he has made presentations worldwide on various aspects of food safety and the uses of multimedia and the Internet in science.

As one student wrote, "His style of teaching does not make the students feel overwhelmed but rather encouraged to learn about nutrition for their own benefit and longevity of life." ■

Take Charge America Endows $10 Million to the School of Family and Consumer Sciences

By Sarah Wadsworth

Pledging up to $10 million to the College of Agriculture and Life Sciences' School of Family and Consumer Sciences, Take Charge America, Inc. (TCA) established the TCA Institute for Consumer Finance Education and Research in 2003, an institute that will educate students on all aspects of personal money management.

The money—2.4 million of which has already been received—will create an endowment to fund the expansion of classes and increase financial literacy among college students.

"Words cannot begin to express our gratitude," said UA President Peter Likins. "The University is delighted with the opportunity that TCA's generous endowment offers and we are looking forward to becoming one of the nation's leading centers in personal financial education and research."

Founded in 1987, Take Charge America is a non-profit charitable organization headquartered in Phoenix. TCA is committed to helping consumers gain control of their finances through education, counseling, and when necessary, debt management.

Supported by the School of Family and Consumer Sciences, the new institute brings together the resources and expertise of academia and the credit counseling industry, two very different entities with a shared goal of developing knowledgeable consumers. Activities will include outreach programs, research, and the creation of new knowledge in consumer behavior and education for all ages. Students had the opportunity to enroll in money management classes starting in fall 2004 that were designed to provide them with lifelong financial skills, in addition to counting for college credits.

"This program provides students with much-needed information on personal finance, wise use of credit and strategic planning to be financially secure throughout their lives," says Melinda Burke, the institute's interim director.

The endowment is among the top five largest donations the College of Agriculture and Life Sciences has ever received, according to Bryan Rowland, director of CALS development and alumni affairs. Initial contact with TCA was through the Students In Free Enterprise (SIFE) Team's Credit-Wise Cats student credit counseling project. Credit-Wise Cats is a student-run organization that provides free financial advising to UA students and faculty.

The average college student's debt amounts to $2,700, according to Credit-Wise Cats, an amount that can quietly accrue through seemingly innocent transactions—lunch, gas, trips to the movies, etc.

"It's often a shock to graduates when they realize how much they've been spending," said Kimberley Brooke, program coordinator for the center. "The Institute is going to help students focus on what's going into their checking accounts as opposed to what's coming out."

The TCA Institute is part of the Southwest Retail Center for Education and Research in the School of Family and Consumer Sciences and the College of Agriculture and Life Sciences.

The TCA Institute for Consumer Finance Education and Research will be led by a newly created endowed chair. The position will have faculty appointment in teaching, research and outreach, beginning in August, 2005.

TAKE CHARGE AMERICA PRIORITIES

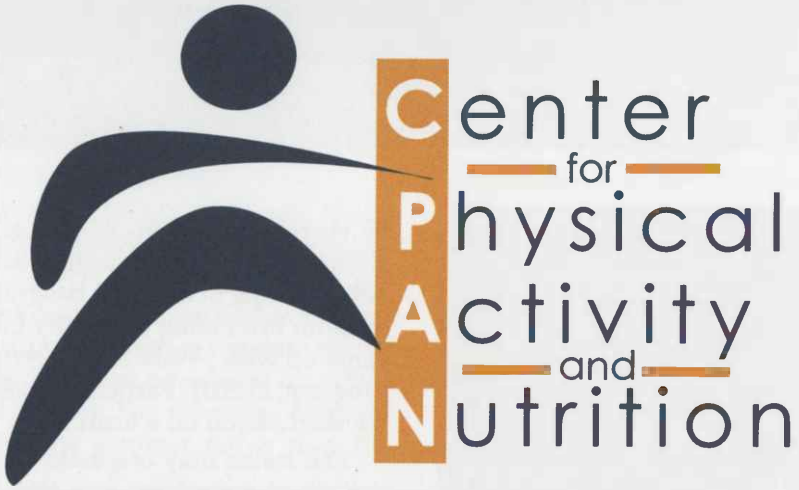
The Take Charge America Institute addresses financial literacy though a three-pronged approach in both informal and classroom programming:

Education – reaching a broad audience, including students, adults, and families through educational programs.

Research – investigating the causes and effects of consumer debt and financial stress.

Outreach – providing assistance, materials, and speakers to schools, organizations and community leaders.

For more information contact Melinda Burke (520) 621-1140, mburke@ag.arizona.edu, or see cals.arizona.edu/fcs/tcai.



Center for Physical Activity and Nutrition (CPAN)

Improving the Health and Well-Being of People of All Ages

Scientific studies have shown that physical inactivity and unhealthy nutritional practices are root causes of chronic diseases such as obesity, cardiovascular disease, diabetes, osteoporosis, and some forms of cancer.

The consequences—poor health, increasing disability, loss of independence, poor quality of life, and premature death—are severe.

The costs in pain, suffering and medical expenditures to individuals, families and communities in Arizona and across the nation are staggering, reaching $117 billion dollars and causing 400,000 American deaths annually.

The good news is that healthy physical activity and nutritional practices can help reverse these trends. Under the direction of Linda Houtkooper and Scott Going, professors in the College of Agriculture and Life Sciences, and Dr. Tim Lohman and Lauve Metcalfe in the College of Medicine, concerned faculty and staff in more than 10 University of Arizona departments and special centers have created the Center for Physical Activity and Nutrition (CPAN).

Launched on April 8, 2004, CPAN is a collaboration between the University of Arizona College of Medicine and the College of Agriculture and Life Sciences. Its mission is to improve the quality of life and longevity of people and communities in Arizona and America through physical activity and nutrition research, education and services.

CPAN evolved from several National Institutes of Health-funded research projects over the past 20 years that focused on the effects of physical activity and nutrition on body composition and health. Out of this research came follow-up studies over a two-to-eight-year period showing specific beneficial long-term effects of healthy physical activity and nutrition practices on disease prevention.

For example, CPAN team members have already developed and implemented several innovative nutrition and physical and activity-based osteoporosis prevention and healthy weight management programs. These programs promote healthy long-term physical activity and nutrition practices that improve the health and well-being of children, adolescents, and young and older adults.

The Bone Estrogen Strength Training (BEST) study found that women between the ages of 40 and 55 who followed a specific weight training and exercise program were able to raise their bone density an average of 1 percent per year at a bone site in their hip, which is roughly equivalent to the amount of bone mass lost per year in individuals with osteoporosis. In the Healthy Weight 4 Life study, participants following a combined program of proper nutrition, regular exercise and motivational meetings were able to lose an average of 11 pounds over a 16-week period.

Based on these and other research results, the many faculty involved in CPAN have identified physical activity and proper nutrition as key areas in a strategic plan for improving the health of the nation. To translate this plan into action, CPAN is bringing together basic and applied scientists, educators, practitioners, and community leaders to:

- Foster innovative research and translate new discoveries into culturally appropriate and effective individual and family programs. These will include state-of-the-art exercise and nutrition research and education programs.
- Lead the way in advancing the understanding of the long-term effects of physical activity and nutrition on health promotion and disease prevention. ■

For more information on CPAN see www.cpanarizona.org or contact Michele Graves, mgraves@u.arizona.edu,(520) 626-2639.
The BEST exercise manual is described on page 2.

Walk Across Arizona

Community Fitness Program

By Joanne Littlefield

Photo courtesy of Green Valley News & Sun

Comfortable shoes, sunscreen and a bottle of water are all you need to start a walking program.

Despite what the name may imply, you won't see bands of people linked arm-in-arm, plodding across the desert, over mountain ranges and along the Colorado River. Rather, "Walk Across Arizona" has become a way for local community members to learn more about their neighbors while participating in a healthy alternative to the life of a couch potato.

It all began in Green Valley, Ariz., where many retirees from colder climates spend the winter. Since their permanent residences are somewhere else, the retirees may often feel disassociated from the community they live in only temporarily, according to a 1998 study compiled by the Health and Human Services Committee (HHSC) of the Green Valley Community Coordinating Council.

The initial goal was to design an activity that would build community, says Pima County Family and Consumer Sciences Extension Agent Linda Block. "They wanted first of all to build community in getting the message across that 'Green Valley is my home'." The second goal–promoting a healthy lifestyle–works hand-in-hand with a need to maximize the retirees' independence by encouraging them to stay as active as possible. Some children from the Sahuarita area participated the first year. After looking at different programs in the country, the task force on Promoting a Healthy Lifestyle, part of the HHSC, came up with "Walk Across Arizona," a 16-week walking program, in 2001. Participants register for the program and are then placed on a team.

"The teams may originate in the homeowners' association, or at a worksite or a club," Block says. "They track their miles and report them each week to their team captain who in turn reports them to the central gathering place for information." This varies with the group, and can include the Cooperative Extension office, or Green Valley Recreation.

In the first year of the campaign, 34 teams of 10 individuals from Green Valley and one from Tucson walked 48,872 miles with 329 registered participants; the average number of days walked by participants increased from 4.1 at entry to 4.6 upon exit, and an average of 11.4 miles per person and 91.2 miles per team were walked per week.

The second year the program expanded to 37 teams, walked 62,054 miles, with a total of six counties represented. Participants included a range of ages and lifestyles, from retirees, homeowner associations, cooperative extension staff. They walked in neighborhoods, schools, wilderness trails, anything that was convenient to them. Some did mall walking, some folks who couldn't get out used walking videos to record their miles. Fifty-one percent of the walkers in the second year reported at the end of the 16-week walking program that they had increased energy, while another 43 percent reported feeling less stressed. Teams walked an average 4.6 days per week and averaged 48.5 minutes of walking per day.

Each program includes a kick-off phase, a motivational program, the 16 weeks of group walking, and a wrap celebration. When the official program ends, participants are encouraged to walk on their own, and make it part of their lifestyle.

"The whole idea of having it for 16 weeks is that when it ends, people will continue walking or some form of physical activity," Block says.

The third year of the campaign started in early-November 2003 with 47 teams, including 15 teams of 150 miners at Phelps Dodge, Sierrita, Inc., registered in Pima County. As of December 31, 2003, 460 individuals reported 38,455 miles walked in Pima County.

At one retirement community in Green Valley, the team captain is a 90-year-old woman with a team member 93 years of age, the oldest participant in the program. At the

same retirement community, 82-year-old identical twin sisters walk an average 16 miles per week and lead walking excursions around the retirement campus three mornings per week.

"We love to exercise, but it isn't to try to live to be 100," they say. "We just want good quality of life."

Cooperative Extension teams in Maricopa and Yuma started in December 2003 and January 2004, respectively.

"Statewide we have about 525 people enrolled in the 2003-2004 campaign," Block says. "Because we have different weather conditions in different areas of the state, we've designed the 16-week program to be scheduled by different counties to fit their climates. For example, Flagstaff may want to participate in the summer rather than the winter."Another program developed by the Cooperative Extension Community Health Advancement Partnerships (CHAPS) program is a physical activity program for seniors.

"It's a nine-week curriculum where we go into their congregate meal sites, introduce the concept of physical activity and implement the program," Block says. Participants are given a pre- and post-test to discern their activity level. "It is our hope that these individuals too will form walking clubs to continue to stay physically active."

The counties participating in 2003 included Apache, Cochise, Santa Cruz, Maricopa, Yuma and Pima. In 2004, Cochise, Maricopa, Yuma and Pima counties are involved. ■

For more information or to participate, contact: Linda Block, (520) 626-5161, lblock@ag.arizona.edu.
Examples of activities are located at msg.calsnet.arizona.edu/walkacrossaz/.

Exercising to Prevent Adolescent Obesity and Diabetes

By Susan McGinley

Physical inactivity is a risk factor for obesity and non-insulin dependent diabetes mellitus in children and adults. Studies show that physical activity declines more dramatically in girls than in boys during and after puberty, and this decline is associated with greater adolescent obesity and on earlier onset of diabetes.

To fill a need for physical activity programs designed to suit the unique interests and needs of adolescent girls, researchers in the Department of Nutritional Sciences, together with colleagues in the UA Colleges of Medicine, Public Health and Education, are working together to develop and test a comprehensive physical activity program tailored specifically to the interests of adolescent girls. The scientists are collaborating with investigators at seven other universities: Johns Hopkins University, University of Maryland, University of Minnesota, University of South Carolina, University of North Carolina-Chapel Hill, Tulane University, and San Diego State University.

In 2002 a comprehensive program was developed to engage adolescent girls in regular physical activity. Known as TAAG (Trial of Activity of Adolescent Girls), the project promotes a unique university-community-agency-school partnership to develop, deliver, and sustain the program. Girls have the opportunity to participate in diverse school-based community-based programs designed to appeal to many interests (e.g., P.E. and traditional sports teams, dance, kick-boxing, Jump Rope for Heart and others). The program is currently being tested for its appeal to adolescent girls and its efficacy for increasing physical activity and improving heart and lung function.

More than 1,800 girls participated in Phase I, including 310 girls in Tucson, in studies designed to test intervention activities and develop measurement protocols. Girls took part in dance and drama, ethnic dance, Jazzercise, and other girl-friendly activities, and a new equation was developed for estimating body composition in Anglo, Hispanic and African-American girls.

Approximately 3,000 girls in six cities are currently participating in innovative activity programs during and after school. In Tucson, 450 seventh-grade girls in Amphitheater, Sunnyside and Catalina Foothills School Districts are participating. If successful, it is expected that schools and communities nationwide will adopt this one-of-a-kind program developed specifically for adolescent girls. ■

For more information or to participate, contact Scott Going, (520) 621-4705, going@u.arizona.edu.

J.S. Littlefield

DIRECT FARM MARKETING AND AGRI-TOURISM IN ARIZONA

By Joanne Littlefield

Ten years ago just a handful of agricultural producers in Arizona were directly marketing their crops and value-added products to the general public. The owners of apple orchards in Cochise County had developed ways to serve consumers through roadside stands, bakeries and restaurants. In Yavapai County, the Young family was refining their operation around sweet corn and pumpkin harvests.

Today, visitors can buy products on-site at farms in nine Arizona counties and on one Indian reservation, thanks in part to an educational program developed by the University of Arizona College of Agriculture and Life Sciences (CALS). Faculty in the college have been teaching local growers and ranchers the value of selling their products directly to farm visitors since 1995.

"There are many people who are two or three generations removed from the farm," says Russ Tronstad, a co-developer of the Direct Farm Marketing Tourism Conference and notebook, and CALS agricultural economist. "They just don't have an uncle or aunt or grandpa to visit and experience the farm like they used to."

The range of activities may include taking children to see farm animals, purchasing wholesome, organic food or simply a ride out to the country. Tronstad says educating and entertaining an urban audience is also increasing profitability for the holders of valuable land near urban centers. "Producers realize that there's no profitability in just producing raw commodities so they've turned to direct marketing for higher prices in particular."

He notes that the only way many farmers justify not selling their land for development is if they can fetch prices that are substantially above raw commodity prices for the products and activities that come off their land. Marketing directly to the general public, while not without its hassles, has proven to be a way–for some–to preserve a part of the family farm that has been in the family for generations.

The effort to expand direct farm marketing, or agri-tourism, in Arizona, began more than a decade ago when Julie Leones, a CALS extension economist in the Department of Agricultural and Resource Economics, began to quantify the economic impact of agricultural direct marketers in Cochise County through a research survey. Her results were a catalyst for developing the direct farm marketing notebook. This resource, available online, offers Arizona growers information on planning their agri-tourism enterprises.

The educational curriculum was designed to provide producers with an A to Z publication for finding the essentials needed to start and develop a direct farm marketing enterprise. Topics include marketing trends, crop selection, roadside stands, selling to restaurants, value-added items

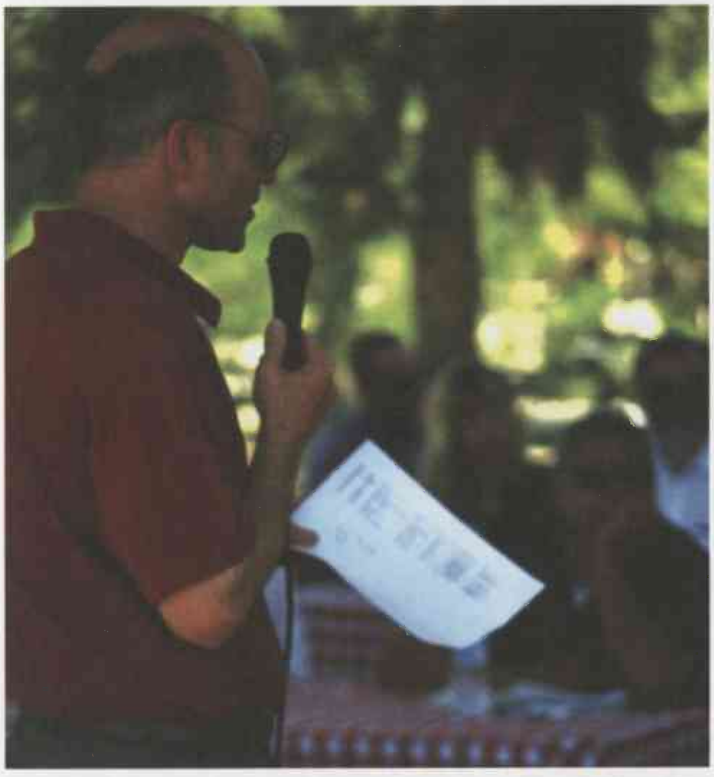
such as bakery goods, advertising, pricing, legal aspects, and risk assessments.

Along with the notebook, agricultural and resource economics faculty designed and offered the annual Direct Farm Marketing and Tourism Conference. Now in its 10th year, the event draws interested producers from throughout the Southwest. It draws both regular and new participants who are investigating whether they should try direct farm marketing. Generally 50 to 100 individuals attend the conference, and the notebook has reached thousands of people.

Requests to use the notebook for a short course or class have come from other Western states, Australia, Canada and South Africa. Producers have been able to network and learn from each other at the annual conference by sharing their failures and successes. Last year an Arizona Farmers' Direct Marketing Association was formed so direct marketers could better share ideas and coordinate marketing activities.

Another direct marketing resource recently made available is *Western Profiles of Innovative Agricultural Marketing: Examples from Direct Farm Marketing and Agri-tourism*.

"This publication examines how several operations in the West have migrated from a traditional commodity-focused business into a successful direct marketing enterprise within the last 10 to 15 years," Tronstad says. "It is not intended to be a step-by-step guide on how to start a direct farm marketing or agri-tourism enterprise, but rather a tool to identify the more subtle and unique factors behind the failures and successes of the enterprises examined, to help farmers determine their strategies for meeting future challenges and risks."

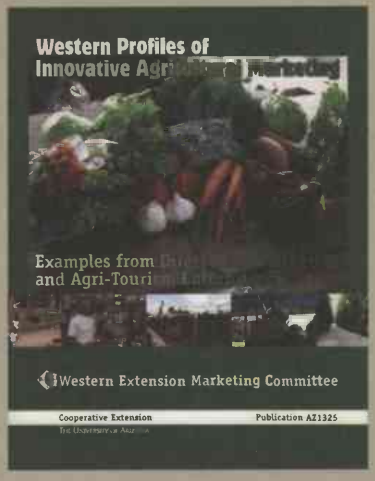


J.S. Littlefield

Russ Tronstad addresses local producers at an agri-tourism conference.

J.S. Littlefield

Western Profiles of Innovative Agricultural Marketing: *Examples from Direct Farm Marketing and Agri-Tourism Enterprises*



Published by the Western Extension Marketing Committee and University of Arizona Cooperative Extension, this book is a collaborative effort with authors from seven western states. The publication identifies the sometimes subtle and unique factors behind the failures and successes of seventeen enterprises located in western urban and rural settings. Using a case study approach, farmers learn concepts that can be applied to stabilize and enhance their businesses, as well as strategies to meet future challenges and risks. Enterprises include a Nevada farm using e-commerce to sell hay to pet owners, a Hawaiian farm marketing processed Kona coffee to Japanese customers through agri-tourism, and Colorado ranchers working as a cooperative to develop a market for "natural" beef. Contents of the 122-page color publication are available as free downloads at **cals.arizona.edu/arec/wemc/westernprofiles.html.** Printed copies may be purchased online for $10.00 at **cals.arizona.edu/calsmart.**

Resources: The Direct Farm Marketing and Tourism notebook is available online at https://cals.arizona.edu/AREC/pubs/pubs.html. For more information contact Russ Tronstad, (520) 621-2425, tronstad@ag.arizona.edu.

Cultivating Edible Seaweed in Hawaii

New technique helps local farmers

By Mari N. Jensen

S. Nelson

Seaweed cages in lagoon.

S. Nelson

This edible red seaweed, called "long ogo" by the Japanese, is eaten by people in Hawaii, Asia and the Pacific.

Although a yearning to surf was what first drove native Tucsonan Edward Glenn to Hawaii, what keeps him going back is his life-long interest in marine agronomy. Now, instead of hanging out in the waves, Glenn spends his time on the leeward side of the island of Molokai, working with the local community on sustainable aquaculture projects for the ancient fishponds that dot the island's south coast.

Rather than growing fish, Glenn and his colleagues are focusing on the edible red seaweed *Gracilaria parvispora*. The alga, known as "long ogo" by the Japanese, is eaten by people in Hawaii, Asia and the Pacific and is also a source of agar, a common thickening agent in Japanese cooking.

"Long ogo" was once the most important edible seaweed on Hawaii's reefs. In the past, people would go out to the reef and yank the seaweed off the rocks or even take the whole rock, Glenn says. Ultimately, the reef populations of seaweed declined. People started to grow another species of seaweed in tanks on land, but the replacement just wasn't as good.

"This particular seaweed is the one that people desire the most, and it has become overharvested on the reefs of Hawaii," says Glenn, a professor of soil, water and environmental science in the University of Arizona's College of Agriculture and Life Sciences (CALS). "Our scientific challenge was to find a way to put the seaweed into a practical aquaculture system. People have been trying for years to grow this particular species, and they haven't been able to do it."

However, Glenn and his colleagues *have* done it. The group, which includes researchers from the Department of Soil, Water and Environmental Science's Environmental Research Laboratory (ERL) and others in Hawaii, has developed a way to grow the complete life cycle of "long ogo" without needing to harvest starter plants from the ocean. Glenn says the sustainable system for growing fresh "long ogo" is unique in the United States.

In 1990, Glenn was in Hawaii helping his former graduate advisor, Maxwell Doty, find places in the Hawaiian islands suitable for cultivating seaweed. Molokai stood out as the best spot for such a project: the ancient fishponds still existed, some islanders had begun a fishpond revival movement and the local community wanted the kinds of enterprises that would mesh with their rural lifestyle.

Molokai is a relatively undeveloped island, without the coastline-oriented tourist industry prevalent on Hawaiian islands such as Oahu and Hawaii. Many Molokai residents cherish their rural lifestyle and want to continue traditional Hawaiian ways of life, rather than converting the island's economy to one dependent on tourism, Glenn says. However, Molokai also has limited opportunities for employment. An aquaculture project focused on growing "long ogo" in the ancient fishponds would satisfy a lot of different needs.

So Glenn applied for some funding from the National Coastal Resources Institute, a branch of the National Oceanic and Atmospheric Administration and has been working on

the project for over a decade. In 1998 he teamed up with Stephen Nelson, former director of the University of Guam's marine biology lab, who had retired to Tucson. Currently a senior research scientist at ERL, Nelson's primary research focus is the Molokai project.

Now the "long ogo" project is a $300,000 enterprise that, by supplying seaweed to markets in Honolulu, provides additional income for about 40 farmers. The project has also developed several seaweed-based specialty foods, such as Molokai Limu Salsa, thereby enlarging the market for the farmers' harvest. Having a small aquaculture business is a significant source of additional income for many of the farmers.

A key part of the project is the hatchery, run by Ke Kua'aina Hanauna Hou (KKHH), a nonprofit organization that develops aquaculture enterprises for coastal residents. In KKHH's hatchery tanks, algal spores are allowed to settle onto rocks or coral chips and start growing. Then those rocks or chunks of coral are given away to the farmers so they can start their own plot of "long ogo." Farmers can have a load of seaweed-covered rocks delivered by pickup. The starter plants can be grown in a variety of places: an ancient fishpond in the ocean, as part of a land-locked fishpond, or even in the effluent runoff ditch from a shrimp-farming operation.

If the plants are grown in the ocean, once the mass of seaweed gets big enough, the farmer harvests it and sells the harvest back to KKHH, which then sells the fresh seaweed to markets in Honolulu. Once a plot is established, it provides a continual source of "long ogo," because the base of the seaweed remains in place and keeps growing anew. The little plots of "long ogo" that are grown in the ocean also release spores periodically, thereby replenishing the natural population.

"This is actually repopulating the reef," says Nelson.

Growing the plants in the unappetizing waters of fishponds or shrimp-farming effluent provides the seaweed with a ready source of the nutrient nitrogen, but plants from those environments cannot be marketed as is. So KKHH will buy back the fertilized plants and place them in a cage in a clean-water lagoon. Once there, the lagoon's waters cleanse the plants. The plants bulk up, doubling or tripling in weight as they use their stored nitrogen. At that point, KKHH sells them.

What does "long ogo" taste like? Glenn says it is eaten fresh and often combined with other foods. "It's crunchy and slightly salty, like a pickle without the vinegar taste." One of his favorite long ogo dishes is ahi poke, a Hawaiian dish like sushi that combines cubes of fresh, raw tuna, pine nuts, chopped ogo and sesame oil with some soy sauce.

The team is working on a way to combine "long ogo" production with fish farming in the ancient fishponds. Although the ponds were used by the ancient Hawaiians for fish aquaculture, the walls have not been maintained and the ponds no longer hold fish securely. However, fish could be stocked in the ponds within net pens. If the pens were large enough, basket cages of seaweed could be placed inside the pens, allowing the plants to take up the nitrogen from the fishes' waste products. The researchers are still working out the details. Nelson says such combination aquaculture would help smooth out the income stream for fish farmers.

"For fish, you have to wait several months to sell them, but the seaweed could be sold every couple weeks and make the operation financially stable."

The project has been so successful that Glenn and his colleagues are looking for new markets for the specialty seaweed. Last year, the team received a $49,000 grant from the U.S. Department of Agriculture's Cooperative State Research, Education and Extension Service that will let Glenn, Nelson and KKHH develop additional Hawaiian ogo products, such as sports gels, gourmet recipes and healthcare products.

Processing the seaweed could be done as small family businesses, Nelson says. Some large-scale seaweed-processing plants use harsh chemicals to extract the agar, but Nelson sees an opportunity to extract Molokai agar in gentler ways so it can be marketed as an organic product. "We can say this was grown in the pristine waters of Hawaii."

S. Nelson

Fish tank on Molakai, Hawaii.

The Environmental Research Laboratory

The Environmental Research Laboratory (ERL) is a specialized off-campus component of the Department of Soil, Water and Environmental Science in the College of Agriculture and Life Sciences. It fulfills a unique function within the University of Arizona by conducting innovative, applied environmental research and education programs relevant to desert ecosystems. Areas of ERL research include:

- Water quality and human health protection
- Risk assessment
- Sustainable arid land food production
- Community lifestyles and resource efficiency
- Desert ecosystem maintenance and restoration

The facility is located on an 8.6 acre facility 10 miles south of Tucson.

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Making Compost at the UA Dairy Saves Money and Recyles Waste

By Susan McGinley

Lots of backyard gardeners have tried composting—tossing clippings and leafy kitchen waste into piles that are turned and fed periodically until a crumbly mulch results. It helps the plants grow, saves money on fertilizer and recycles waste that otherwise would have gone into the trash or down the drain.

On a larger scale, that's what is happening at the University of Arizona's dairy at the Campus Agricultural Center in Tucson.

Four years ago, after paying to haul 1500 cubic yards of manure yearly from the dairy, manager Dan Foster switched to composting. Since then, the rich mix of manure and clippings from the College of Agriculture and Life Science farm on north Campbell Avenue has served as a soil amendment for landscaping needs both on and off campus.

"We have a dairy with 300 cows," says Tracy Everingham, who succeeded Foster as farm manager. "It used to take one of our full-time employees nearly half his time to load the manure and haul it away. Some of it went to a farm in Marana or to other places with active farming and gardening. When they had all they could use, the rest went to the landfill."

Disposal costs amounting to $1000 a month included the employee's wages, the truck and dumping fees. Although they are still refining their techniques after four years, the dairy is producing such rich compost already that others now are willing to pay the cost to haul it away. It's the mix of materials that makes the difference.

Farm supervisor Ken Kriederman says the farm's sources for compost ingredients include a lot more than the manure from the brown Swiss and Holstein cows.

S. McGinley

As a part of the composting process, this tractor attachment turns, waters and aerates the manure pile.

"We add horse manure from the equine center, sheep manure from the farm, the sawdust used as bedding material for livestock, grass clippings from the turf center and our own landscape trimmings," he says.

The compost also includes green waste generated in the greenhouses of the Controlled Environment Agriculture Center, and chipped waste from campus fields and grounds. The farm crew takes anything that can be recycled—alfalfa cuttings from variety trials, even palm fronds.

The farm crew begins each batch of compost by adding manure from the livestock pens to rows of green waste that have been deposited on the open ground behind the dairy. Each row is about 250 feet long, seven feet wide and four feet high.

"Twice weekly we turn, aerate and water the pile, and monitor the temperature and moisture," Everingham says. Temperature is critical.

"We want to get it up to over 140 degrees for as long as we can keep it there to eliminate pathogens and weed seeds," Kriederman says. The compost generates its own heat as the various beneficial microorganisms in the manure and clippings interact. UA faculty and students have sent samples of the compost for laboratory analysis to make sure the heat of the pile has "cooked" any pathogens out of it.

It takes about four months to "cook a row," or turn each raw pile into finished compost, depending on the mix of ingredients used, according to Kriederman. The Campus Agricultural Center generates more than 2400 cubic yards of compost per year for use on ornamentals, trees and vegetables. Much of it is applied on campus, where it serves as a mulch around trees. There are plans to include developing a compost for fertilizing the pastures, but right now the farm lacks the equipment needed to haul and spread it.

The farm also provides compost to various community organizations. "We donate a lot to gardens at the Tucson Community Food Bank, the Arizona School for the Deaf and Blind, several elementary schools, and the Tucson Food Coop," Everingham says. Some of the compost has also been donated to the Native Seeds/SEARCH farm in Patagonia, and the Department of Corrections (DOC).

"We were very happy when the UA said they'd donate compost," says Michelle Phillips, executive director of Stepping Stones, a DOC graffiti abatement project that focuses on nature and gardening to interest youth in caring for their community.

Through the compost program, the campus farm is doing far more than saving the money it used to spend to truck the compost away, Everingham says. "We're recycling materials from all over the farm and generating a product that is useful so it doesn't have to end up in a landfill." ▣

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Can We Restore Wetlands and Leave the Mosquitoes Out?

By Kara Rogers

E. Willott

The Sweetwater Wetland was built in 1996 to help treat secondary effluent from the adjacent wastewater treatment plant.

When it comes to restoring nature, some members of the natural world are shunned for good reason. Restoring wetlands has a foreseeable and inevitable downside: the creation of mosquito habitat.

Breeding disease-transmitting mosquitoes isn't just a surprising side effect of creating wetlands, but an inevitable and foreseeable consequence that must be acknowledged when planning wetland restoration projects, says Elizabeth Willott, an assistant professor in the department of entomology.

Wetlands do have benefits for people, she says. "Wetlands clean water, help in flood control, provide habitat and have aesthetic value." Even so, she adds that environmental ethics require taking into consideration that after a wetland is restored or created, people's exposure to mosquito-borne diseases may increase.

To understand the impact that mosquitoes can have, just consider the mosquito-borne West Nile virus. In just a few years, West Nile virus, first found in the United States in New York, has already spread as far as Washington state and Arizona.

Diseases transmitted by mosquitoes, such as malaria, encephalitis and West Nile virus, can be just one bite away. In the 1800s, when Tucson's now-dry river beds had water more regularly, malaria was present in the Tucson basin.

Although malaria is not in the Tucson area now, Arizona's West Nile virus season has already begun.

"Several obstacles block people from frankly discussing mosquito problems," writes Willott in her paper "Restoring Nature, Without Mosquitoes?" The article is published in the June 2004 issue of *Restoration Ecology*. Willott's work was supported in part by a fellowship from the University of Arizona's Institute for the Study of Planet Earth and the UA's Udall Center for Studies in Public Policy.

The short-term nature of funding is one problem. Another is the fear that bringing up negative aspects of a wetland restoration project makes it more likely the project will be rejected. However, Willott suggests that a proposal is strengthened by explicitly addressing mosquito control. Ultimately, the location and ecology of a restored wetland will determine whether intervention is necessary—or even possible—to control mosquito populations.

The social climate of a region also plays a role. "When we restore wetlands we not only alter nature in a particular spot, we also typically alter social contexts," Willott notes. "We also want to build healthy, sustainable human communities." The upsides and downsides of restoring a wetland should be addressed before a project begins. Considering all aspects allows better decision-making about what is best for the community as well as the wildlife, according to Willott.

She cites the Sweetwater Wetland in Tucson, Arizona, as a good example of a well-managed, human-made wetland. The wetland is monitored regularly for mosquitoes, and a range of tactics are used to keep mosquito populations at bay. At Sweetwater, those tactics include managing the vegetation and using biological insecticides to keep mosquitoes populations down.

Historically, mosquito problems were often dealt with by just draining or filling in wetlands. More recently, broad-spectrum chemical pesticides have been used in the United States for mosquito control. Willott says there are better ways to manage mosquito problems.

"What is best depends on both the local ecological and social contexts," Willott says. "We need to know answers to questions such as: What mosquito species are present? What threats do these pose for people? If the threat is significant and mosquitoes need to be controlled, we must also ask: How can mosquitoes be managed effectively in this location and in such a way that there is minimal risk from our management strategy?"

E. Willott

American coots, one of the many species that use the wildlife habitat provided by Tucson's Sweetwater Wetland.

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What If I Don't Like Bananas?

Kids Café offers better nutritional choices

By Kirsten Compton

S. McGinley

Clap once if you can hear me; clap twice if you can hear me NOW." Two claps ring out and a hush falls over the children seated in lines on the floor at the Marty Birdman Neighborhood Center in Tucson. As part of the Kids Café after-school feeding program they're getting a nutrition lesson this Monday afternoon on avoiding germs and bacteria. Then they'll help prepare—and eat—their own healthy snack before going out to play.

"After I call your name stand up, go wash your hands and then sit down at the tables so we can start the lesson" says Anthony Pabst, a University of Arizona freshman at the center. Activity books featuring today's topic are distributed to the 16 students present, and recreation assistant Carrie L. Joe begins.

"What happens when you put the milk in the cabinet instead of the fridge?" she asks. Ten hands fly up but they're too late. Someone blurts out the response, "It gets rotten!" The lively exchange continues as Joe and the children discuss ways to store food properly and prevent food poisoning.

Part of the challenge in Kids Café is to hold the children's attention after they've already spent the day in school. There is just enough time to give them a 15-minute lesson at 4:30, offer a snack and let them play outside before they are picked up about an hour later. Lessons have to get to the point quickly, according to Patricia Sparks, a lecturer in the UA department of nutritional sciences, who has been involved with Kids Café since its inception in Tucson in 2001.

"The Community Food Bank or site manager may come up with programs and lessons based on needs," Sparks says. "I've done lessons on a variety of food groups, on calcium and other topics, using games, worksheets, crossword puzzles—things to help reinforce the lesson because attention spans range pretty dramatically."

She says the lessons may focus on physical activity as well because some of the children may have difficulties with weight control.

Sparks worked with food bank staff in developing the curriculum and also coordinates student volunteers and interns from her courses on food management and food sciences. About 75 nutritional sciences students volunteer at five neighborhood centers twice each semester; they can go twice more for extra credit. There are 500 to 600 student visits annually, which works out well for nutritional science students, since applicants for dietetic internships must document volunteer hours or work hours related to nutrition or nutrition education.

They assist the recreational workers at the centers during the lesson, and actually teach the lessons at three locations. This was made possible by a grant obtained through Arizona Cooperative Extension's involvement in the Food Stamp Nutrition Education Program (FSNEP).

"Kids Café provides participating children the opportunity to interact with students who are much closer to their age than the typical volunteer," Sparks says. The students in Kids Café range from about 6 to 12 years old, and many have never before seen or tried some of the foods they eat during their lessons.

"A typical snack might include milk or yogurt, a fruit or vegetable, such as baby carrots or celery sticks, perhaps a half sandwich or a granola bar," Sparks explains. "Even just showing these kids fruits and vegetables and giving them the opportunity to taste them is fun because their experience is limited. Mango, kiwi, pineapple and other fruits can be something different for them."

Food choices are limited to what the Food Bank has on hand, which often is more variety than the children get at home. This is echoed by Soroosh Behshad, another UA nutri-

S. McGinley

"Kids Café allows these kids to be exposed to nutrition education, many for the first time, by bringing attention to new foods, the food pyramid and food intake."

—Michael Rozen, a nutritional sciences student and Kids Café volunteer.

tional sciences student, who volunteers at Kids Café. He says many of the kids had their first experience with yogurt at Kids Café, and now they not only have tasted it, but really like it.

"It's very useful to get the children involved in food preparation because it gets them to try things they might otherwise stick up their noses at," Sparks adds. Today's snack is graham crackers topped with peanut butter, jelly and sliced bananas. Each child makes his or her own, and for a while the room is filled with the sound of small mouths chewing crackers. The food is disappearing but not everyone is satisfied.

"I hate bananas, do I have to eat them?" complains a boy sitting up front. No, he doesn't have to, but the instructors do encourage the youngsters to try everything at least once. "Just try two or three bites" is the Kids Café mantra. While it doesn't always change a child's mind, sometimes it does make a difference.

"We get to try new things," said one little girl. "One time we had yogurt with nuts and I don't like nuts. But there are different nuts and I keep trying them. I like the different ones." Having the children prepare their own snack portions also helps.

"They love it because they get to prepare everything," Joe says. "They cut up foods with plastic utensils." Most of the food offered is cold, although the centers have also featured hot food in the past; it depends on the facilities and what is available.

Volunteers in the program have seen a difference in the children's habits.

"The kids are learning a lot, like washing their hands. I am not at home with them, but I know it is making a difference," Pabst notes.

Stacy Lyons, one of Sparks' students who is teaching nutrition classes this fall, notices that the younger students are beginning learn more about food groups and where their food comes from.

"One kid finally realized that french fries came from potatoes and raisins came from grapes," she said. "I think it is great that we are targeting kids at a young age about what is good and what is bad using the food pyramid. The kids finally understand what the food pyramid is." The teaching experience helps not only the children, but also the student teachers. "It makes you realize what you know and don't know, sort of a mini-introduction to the real world."

Once all the children have had their fill of juice and graham crackers, the room suddenly becomes very restless. Little hands reach for the jump ropes and basketballs, and the race for the door begins after the children have cleaned up the plates, cups and utensils. Once they have left for the day the hope is that they will select more nutritious food when they do have a choice.

"I've seen some changes," says Ron Gardin, recreational coordinator of the Marty Birdman Center. "This program has taught the children how to ask for peanut butter and bread instead of candy and sweet stuff." They are given an information sheet to give to their parents at the end of each lesson.

"Its a win-win situation; the neighborhood children get education and snacks; our college students get valuable experience," Sparks said. "I think that as an institution we need to be involved in outreach education."

S. McGinley

What is Kids Café?

Nationally, more than nine million children receive food from a pantry, kitchen or shelter from America's Second Harvest, the country's largest emergency food network. One of the programs started by America's Second Harvest to combat childhood hunger was Kids Café. In 2001, when Kids Café began in Tucson, the Arizona's child poverty rate was 22.3 percent. The program is offered twice weekly in seven locations across Tucson and features a 15-minute lesson followed by a snack made from food provided by the Tucson Community Food Bank. Currently, there are more than 1,000 Kids Cafés across the nation.

S. McGinley

"One boy never had yogurt before. Now he asks his parents for it. He loves it and wants it all the time."

—Meshylla Gardner, senior recreational worker at the Marty Birdman Center in Tucson

Contact Pat Sparks, (520) 626-9536, psparks@ag.arizona.edu. For more information on Kid's Café see www.secondharvest.org. For more information on the CALS Nutritional Sciences program see cals.arizona.edu/NSC/index.htm.

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