Food Security in the Western US
The Western Rural Development Center compiles this magazine with submissions from university faculty, researchers, agencies and organizations from throughout the Western region and nation. We make every attempt to provide valuable and informative items of interest to our stakeholders.

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Americans spend a smaller share of their income on food than at any time in history and they spend proportionally less on food than any other society in the world. The variety of food choices in a modern grocery store at any time is astounding. Fruits and vegetables that were once seasonal are now available throughout the year. Exotic tropical fruits that I had never heard of during my childhood are now always available at my local grocery store.

Despite these benefits, the very same global industrial food system that provides such cheap and abundant food has come under increasing attack during recent years. Among the concerns:

1. Communities and regions are no longer food self-sufficient. Even major farm states import the vast majority of their food. Most farms grow only a single item, or at most a few items that they then market to the global industrial food system. This raises severe food security concerns when one considers how easily this system could be disrupted.

2. The global industrial food system uses vast amounts of energy to produce, process, transport, and store food. Cheap energy led to the centralization of the food system. Increasingly expensive energy raises concerns about the future of the food system. And a system so energy consumptive is simply not sustainable.

3. There are growing concerns about the health consequences of a diet based on the modern industrial food system. At the present time, many Americans eat regular meals at fast food restaurants, and consume massive amounts of foods laced with sugar and preservatives. Among the consequences are high rates of obesity, especially among children, and the skyrocketing occurrences of diet related illnesses such as Type II Diabetes. It seems increasingly likely that for the first time ever, a generation of children will not live as long, on average, as their parents.

4. The highly productive crops grown in the monocultures that comprise the global industrial food system necessitate ever-larger amounts of fertilizers and pesticides to deal with increasingly resistant insects, funguses, viruses and other pests. These fertilizers and pesticides then wreak havoc on downstream waterways and the dangers from highly toxic pathogens emanating from the food system are a growing public concern.

5. Despite the abundance of cheap food, hunger and food insecurity are a significant concern for some segments of the population.

In this issue of Rural Connections we highlight several programs that increase food security and attempt to improve the health benefits and safety of our food system.
To address this litany of problems, researchers, extension specialists and others have been seeking solutions. Among the more innovative solutions include workforce development programs geared toward out-of-work farm workers, farm to school programs where schools purchase products from local farms, community gardens, community supported agriculture programs, and the local-farming and farmers-market movements. Each of these efforts seeks a solution to one or more of the problems described above. All are consistent in an attempt to provide nutritious, locally-produced food to a broad spectrum of community residents in ways that are environmentally sustainable and enhance rural economic development by expanding markets for local farmers and for locally-produced foods.

In this issue of *Rural Connections* we highlight several programs that increase food security and attempt to improve the health benefits and safety of our food system. Our goal is to increase awareness of the programs so others will implement them. Increasing the impact of these programs to ensure that they have the greatest possible impact will require communities, consumers, agencies and organizations to have the best information possible and will require a strong and reliable research, education and outreach base.

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Each November the USDA releases an annual report on household food security in the US. Food insecure households are those in which not everyone in the household “had access at all times to enough food for an active, healthy life.”

Among food insecure households are those that have “very low food security,” a condition where one or more adults’ food intake was reduced and/or their eating patterns were disrupted due to a lack of money. This group is often referred to by advocates (and formerly referred to by the USDA) as being “food insecure with hunger,” or experiencing “hunger.”

To learn more about the questions that households are asked regarding their food situation, visit the USDA’s Economic Research Service website: http://ers.usda.gov/.
Every Autumn, Oregon’s largest newspaper reports the federal government’s newest estimate of Oregon’s household food insecurity rate. Oregon’s unexpected ranking as one of the “hungriest” states in the late 1990s embarrassed state political leaders and mystified researchers. Its subsequent improvement in the early 2000s was the source of some pride among advocates and social service agency leaders. Its recent increase during the current economic crisis has swamped human services offices and area food banks. Over the past 10 years, Oregonians’ rising awareness of food insecurity as an income issue led to extraordinary efforts to provide emergency food and to enroll eligible people in federal food programs. Oregon’s story about food insecurity as a social problem and the public response to that problem may be unique, but we can only know that by comparing it to its neighbors and other Western states.

Policy makers and citizens sometimes puzzle over why their state’s food insecurity rate differs from that of neighboring states, leading to plenty of armchair theorizing about what is special or unique about one state or another. Researchers have made some progress understanding the most important influences on state rates of food insecurity. For example, a study of all 50 states found that, among many other characteristics, housing costs and peak unemployment significantly increase state rates of “hunger” (Tapogna, Suter, Nord & Leachman 2004). Other researchers have noted that the percentage of the state residents who are in a particular category (single mothers, poor people, immigrants, etc.) does not provide a statistically powerful explanation for most state-level differences (Edwards, Weber & Bernell 2007). For example, Oregon’s high rates of “hunger” cannot be explained by the state having higher rates of single motherhood or a higher poverty rate than Washington or Montana.

Changes in state food insecurity rates over time both reveal and obscure important stories at the state level. For example, Oregon’s reduction of its hunger rate between 2001 and 2005 from around 6% to around 3% appears in absolute terms to be a small number getting smaller. However, this decline translates to a reduction from 90,000 to 45,000 households experiencing hunger in a given year. Monitoring such changes does not reveal the exceptional work completed by groups seeking to reduce food insecurity. For example, Oregon’s improvement may well have been due to the state’s phenomenal growth in enrollment of low-income families in the federal food stamp program. Oregon’s collaborative efforts between the Department of Human Services, the Hunger Relief Task Force, the Oregon Food Bank, and other groups dramatically improved access and outreach for the food stamp program. Some Western states have experienced remarkable collaboration between state agencies and nonprofit groups in the fight against hunger, while others lag behind in working well together (Edwards 2008).

What have been the patterns and trends in food insecurity in Western states? Food insecurity rates in the US continue to be slightly higher in the West and in the South than in the Midwest or Northeast (Nord et.al. 2008). But state-by-state, the numbers vary more widely and tend to change substantially year to year,

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Table 1: “Hunger” and Food Insecurity Rates in Western States
suggesting some unique local influences that local leaders and researchers should seek to understand.

The most recent report by the USDA, based on the 2005 through 2007 data, shows that Hawaii has a hunger rate significantly lower than the US (Table 1). California’s rate is also significantly below the national average (with Idaho, Wyoming, and Washington also showing lower rates but with sample sizes too small to confirm that those are statistically significant). Regarding food insecurity, New Mexico continues to have high rates, while Montana’s, California’s and Hawaii’s rates are below the national average (refer to 2nd column in Table 1).

It is important to be cautious interpreting these numbers because of the margin of error in the state estimates, much like a political campaign where one candidate holds a 2% lead in the polls but who could in fact be behind merely due to the sample upon which the estimate is based. However, state hunger and food insecurity rates can contribute to our assessment of continuity and change in economic and social being for Western states. That warning being said, Montana’s food insecurity rate changed from the beginning of the decade moving from well above the national rate to well below (13.2% to 9.5%). Idaho’s situation appears to have improved while Colorado’s worsened (Table 2).

**Rural Food Insecurity in Western States**

While the Census Bureau’s definition of “non-metropolitan” fails to include many places that are rural, we can at least observe some patterns and trends in the west in comparison to the whole country. In 2005-2007, the hunger rate in non-metro areas of the West closely resembled that of the metro West. While hunger increased by about a percentage point in both metro and non-metro parts of the US, hunger actually declined in western non-metro areas and remained stable in metro parts of the region. The reason for this improvement in the rural West is yet to be studied.

The data preclude us from making trustworthy state-by-state comparisons of annual changes in rural hunger rates. However, exploring metro/non-metro hunger and food insecurity rates within states shows that rural food insecurity can sometimes be a few percentage points higher or lower than the urban rates. This implies that state agencies and advocates need to attend to the unique characteristics of rural areas when addressing household food needs.

Several studies have examined some of the unique rural dimensions of food insecurity. For example, Bernell, Weber and Edwards discovered that if rural areas had the same educational levels and occupational opportunities as urban areas, then living in a rural area would tend to reduce a household’s chances of being food insecure (2006). However, the lower educational levels in rural areas counteract the ways that characteristics of rural areas otherwise reduce food insecurity.

The rural food insecurity story is not just one of economic and occupational opportunity, but also the social and geographic characteristics of rural places. The lack of options for where to shop, the cost of basic foods in small grocery stores, and the distance between home and shopping locations all impact the affordability of food for low income rural residents. Also, social service agencies often struggle to reach vulnerable families because of transportation, distance, and other community characteristics (Edwards, Torgerson & Sattem 2009). Better understanding the food insecurity patterns and processes in rural places can inform policy makers, advocates and agency leaders seeking to improve quality of life in the rural West.

**About the Author**

Mark Evan Edwards is an Associate Professor of Sociology at Oregon State University in Corvallis, Oregon.

**Author’s Picks for Further Reading**

USDA’s Economic Research Service
ers.usda.gov/


**References**


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Poverty Amidst Plenty
Understanding Farm Worker Food (In)security in California
BY CHRISTY GETZ AND SANDY BROWN
Fresno County farm workers are one of the most food insecure and poorest in California with 20% of the population living at or below the federal poverty level.

**Introduction**

In this article, we explore one of the most profound contradictions of contemporary US agriculture: that those who produce our nation’s food are among the most likely to be hungry or food insecure. For those familiar with farm worker communities, this irony comes as little surprise. Yet the lived realities of farm workers are, more often than not, rendered invisible to the vast majority of people who rely on their labor for sustenance. In an effort to address this seeming paradox, we explore the concept of food security with respect to California’s agricultural workforce.

At the height of United Farm Workers’ (UFW) organizing, the admonitions of union founder Cesar Chavez that “something is wrong in the system. We are farm workers, harvesting all day produce for others, and we get home and our family doesn’t have enough food to eat.” called attention to the marginalized position of agricultural labor in California’s farm fields. The union’s struggles to improve agricultural wages and working conditions mobilized white, middle-class urban consumers to support a primarily immigrant workforce, in particular through union led boycotts (Frank 2003, Ganz 2000). Yet significant improvements in farm workers’ material conditions have failed to materialize, and food insecurity and hunger remain widespread within farm worker communities.

Little research has been conducted that explicitly addresses the agricultural workforce with respect to hunger and nutrition, although several recent studies suggest that farm workers experience particularly high rates of food insecurity (Harrison et al. 2007, Quandt et al. 2006, Villarejo et al. 2000, Weigel et al. 2007). To address this lack of attention to farm worker communities, the University of California at Berkeley conducted the Fresno Farm worker Food Security Assessment (FFFFSA) in collaboration with the California Institute for Rural Studies in 2004-2005.

**Background and Findings**

California’s hired agricultural labor force is by far the largest in the nation, due in large part to its preeminence in labor-intensive fruit and vegetable crop production. Farm workers are almost exclusively immigrants, the vast majority of whom are from Mexico. The US Census of Agriculture’s official count (2007) is approximately 450,000. However, traditional census data has been found to undercount farm workers (CRLA 2001, Sherman 1997), meaning that actual numbers are likely much higher.

Our findings suggest that documentation status, and food stamp utilization are related to food security status. Not surprisingly, income was by far the strongest predictor of food insecurity and hunger. The average monthly income for those classified as food secure was $762. For respondents categorized as food insecure without hunger, incomes declined to $542 and plummeted to an average of $319 per month for those classified as food insecure with hunger.

As might be expected, our FFFSA results show that farm workers in our convenience sample of 394 native Spanish-speaking agricultural workers were more likely to experience food insecurity and hunger than the overall low-income population of Fresno County (Harrison et al. 2007). Within our study sample, 34% of respondents were classified as food insecure and 11% as food insecure with hunger. This finding that approximately half of the farm worker households surveyed are, in USDA parlance, unable to access enough food for an active, healthy life, should be viewed as nothing short of astonishing, particularly given its occurrence in the most productive agricultural region in the US. In the words of one farm worker, “[s]omething is wrong in the system. We are farm workers, harvesting all day produce for others, and we get home and our family doesn’t have enough food to eat” (Fresno Metro Ministry 2005).

Poverty Amidst Plenty
Poverty Amidst Plenty

Survey estimates that 53% of US farm workers lack authorization to legally work in the US. However 99% of newcomers, a growing share of the agricultural workforce, lack such authorization (NAWS 2002).

Due to a lack of legal status, undocumented farm workers are at further risk of hunger because they are ineligible for critical public safety net programs, including the food stamp program. Within our sample, even those who were eligible (due to legal status and income) often declined to enroll and only 48% of eligible respondents utilized the program. Some respondents suggested they declined to enroll due to fears about jeopardizing their immigration status, while others cited a lack of information about program requirements. Such anxieties extend well beyond eligibility for public assistance programs and resonate with the broader climate of fear in which farm workers operate.

Situating Farm Worker Food Insecurity

While the reasons for the marginalization of agricultural labor are complex and contingent upon specific socio-historical contexts of particular moments in California history, the central dynamic shaping labor relations and workers’ livelihood struggles has been the development of a regime of agrarian accumulation based on capital intensive production and the persistent devaluation of agricultural labor (Mitchell 2007, Walker 2004). While the often-violent marginalization of farm labor was not inevitable, the productive forces and social relations of agricultural production evolved together to make California the nation’s breadbasket, where farm workers often struggle to feed themselves and their families.

Food (in)security is but one of many measures that can be used to assess and evaluate the effects of this devaluation, from poor physical and mental health (Cason et al. 2003, Villarejo et al. 2000) and lack of access to health care and affordable housing (Bradman 2005, Housing Assistance Council 2005), to unsafe and debilitating working conditions, pesticide exposure (Harrison 2008, Reeves et al. 2002) and low annual earnings, long hours, and unstable employment (Bugarin and Lopez 1998). Perhaps the most striking evidence of farm workers’ devalued position is the decline in real wages over the past several decades. Between 1975 and 1995 real wages fell at least 20-25% (Rothenberg, 1998; Villarejo & Runsten, 1993).

The lived realities of farm workers stand in stark contrast to a consistent expansion of California’s productive and profitable agricultural landscape. While farm worker incomes have declined, the value of agricultural products has continued along a trajectory of expansion begun in the 19th century. Between 2002 and 2007 alone, California’s agricultural sales increased 32%, from $25.7 billion to $33.9 billion (US Census of Agriculture 2007). In Fresno County, agricultural sales increased by 32%, from $2.8 billion to $3.7 billion over the same period. Given these statistics, workers’ loss appears to be capital’s gain.

Today, California farm workers hail primarily from Mexico, where the imposition of neoliberal policies has exacerbated livelihood challenges for small farmers, or campesinos, and led to increased northward migration (Barry 1996). Understanding the dynamics of agricultural production and the social reproduction of farm labor in California today (of which food and nutrition are clearly an essential component), thus requires connecting geographies of poverty and inequality across international boundaries (cf Mitchell 2007), from Fresno, California to the southern Mexican states of Chiapas and Oaxaca.

Conclusion

In this paper we have reviewed data on farm worker food insecurity and offered a brief contextualization of how and why farm workers face a daily paradox of “poverty amidst plenty.” In summary, we emphasize that our findings must be understood in a larger sociopolitical context of structural inequalities that farm workers face on both sides of the US-Mexico border.

Since Cesar Chavez’s call for “a revolution of the poor seeking bread and justice,” both bread and justice have continued to be denied to millions worldwide, largely as a result of the contradictions of food provisioning based on capitalist social relations. We view attempts to measure the food security status of particular groups, such as farm workers, as critical to the process of illuminating these contradictions. By connecting questions of food security to the underlying dynamics that produce hunger and hunger-induced migration, we hope to contribute to the opening up of more productive discussions about food security in farm worker communities.
About the Authors

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Authors' Picks for Further Reading


References


The Food Stamp program is the largest of the federal food assistance programs, designed to mitigate food insecurity through subsidies for private food purchases to legal permanent residents and citizens in low-income households below 130% of the federal poverty level (Harrison et al. 2007). While undocumented immigrants are not eligible for food stamps, their US born children are eligible.

By connecting questions of food security to the underlying dynamics that produce hunger and hunger-induced migration, we hope to contribute to the opening up of more productive discussions about food security in farm worker communities.
Faced with declining job opportunities in agriculture production, San Joaquin Valley community leaders and educators collaborate to develop training programs for its citizens. Will this newly trained workforce attract new employers?

The Golden State has lost some of its glimmer if you happen to live on the west side of California’s San Joaquin Valley. Known as one of the breadbaskets of the world, employment tends to be centered on agriculture production. Even in the best of times, income and education levels are low. Now ending a third year of drought, these are certainly not the best of times and some fear that the worst is yet to come. Federal water policies, environmental regulations and the national economic crisis have exacerbated the problems to a point that more than 40 percent of the residents of the two largest communities in the area, Firebaugh and Mendota, are unemployed.

Skill-Building Collaboration
There is a ray of sunshine despite the gloom. The K-12 school districts in the area and the local community college, West Hills College, have collaborated on the Westside Institute of Technology (WIT). Pooling facilities and financial resources, WIT provides short-term job training for high-demand careers.

Most of the classes are mobile and move from community to community so the market is not over saturated and students save on transportation costs. Many of the classes are taught in English and Spanish.

A career ladder approach is used—a job, better job, a career. Skill development is the focus to allow residents to seek higher-paying jobs with more stable futures. As a highly effective strategy to engage students, academics are taught within a career context application; thus, making it more relevant and meaningful to the adult learner.

Working with local employers, the Fresno County Workforce Investment Board and Economic Development Corporation, WIT seeks to identify jobs of the future and the skills needed by those who will fill those jobs. Initial class offerings included maintenance mechanic, forklift, welding, truck driving, and security guard. In order to meet new employer demand, WIT is developing short-term training in solar and other green technologies.

Distance learning equipment is being installed in the three high schools within the partnership that will allow them to share Advanced Placement courses and offer more West Hills College classes. Middle and high school students are engaged in robotics with the help of WIT. The goal is to get more students interested in engineering, math and science.

WIT has a vision of controlling the regional economic destiny by providing exceptional career and technical education leading to career choices for highly skilled individuals. One of those individuals is Griselda Gallegos, who has lived in the small city of San Joaquin for 14 years.

Griselda, who had spent years as a farm worker, speaks of seeing a woman truck driver, “I want to do the same.”

After completing the WIT truck driving classes, she is now employed by food processor Contadina Del Monte as a truck driver. She speaks proudly of how, when her husband couldn’t work, she was able to pay for their house and take care of their three children.

“I want to better my life,” she said with conviction in her voice. “I came to school and I did it. I have my license and a job!”

Mendota resident Camilo Ramirez became a certified forklift driver for Neil Jones Foods.

“I worked a lot of time in the fields and I see a lot of people struggling right now,” he said. The instructors at WIT helped. “I took my tests and I got qualified 100 percent, thanks to the teaching they gave me.”

Camilo and his wife have four children and are content to stay and work in the Mendota area. “It’s my town. I’m glad to be right here.”

Griselda and Camilo are two of 446 people helped by WIT since it first offered training late in 2007. They participated in two of the most popular trainings—truck driving and forklift. Despite 40 percent
Helping people like Griselda and Camilo is important but making sure that a skilled workforce is available to attract employers is the bottom line for WIT. Otherwise, the communities of Mendota, Firebaugh, San Joaquin and Tranquility may become 21st century ghost towns.

Acknowledging this fact helped bring together the college, K-12 schools, county workforce investment board and economic development corporation. In rural communities a coalition is critical to accomplishing change. Yet creating this coalition was no small feat as the communities involved had historically competed with each other for funding. However, recognizing they had been individually unsuccessful in attracting a large training center to the area, they were receptive to working with the college district to begin taking small steps at providing training for area residents. Building trust was critical.

**Building Trust to Build a Coalition**

One way to build trust is to increase meaningful communication. Monthly meetings included the K-12 superintendents and a school board member, the city managers or their designee, the college district chancellor and president, the Fresno County Workforce Investment Board director and often a representative from the Economic Development Corporation. Phone calls were frequent between meetings, which rotated between communities.

WIT used a stone soup approach - each partner brought important ingredients to the mix. One district might have classroom space but no money. Another might have funding but no curriculum. The city had information that a major employer was coming to or leaving but had no way of addressing employer needs. Now, employers who are thinking about locating in the area are invited to WIT meetings to discuss their training needs.

Starting small projects that built trust within the communities often overcame individual personalities who had doubts. The numbers tell a story of their own. Tracking students by their home and employment zip codes provides the spice for the soup that has been created by WIT.

**Overcoming Brick and Mortar Obstacles**

Since there was no major facility available, a portable classroom on the Mendota High School campus served as WIT’s headquarters and the training programs were developed to be mobile so they rotate between communities.

Like any culinary treasure, a well-seasoned chef knows what ingredients are necessary to create a blend that is palatable. In the case of WIT, that chef was Fresno County Supervisor Phil Larson. Larson, who had recently retired from a 30-plus year job in agriculture when he was elected, knew each community’s needs. His persistence was critical to launching WIT and keeping it on track during the initial year. He shepherded the project from afar and leaned heavily on funding agencies to make sure the rural communities received their fair share of job-training dollars. In the past, the rural areas had often been overlooked in favor of directing funding to the larger cities.

Recognizing the value of a coordinated effort took leadership and collaboration. That collaboration has spilled over to other activities in the communities. A current water shortage in the region, in part created by a drought but in greater part due to regulatory, legal and legislative decisions, has threatened the very existence of the communities served by WIT.

**Conclusion**

With WIT now well established and its success documented one student at a time (Figure 1), the communities are better positioned to survive the drought and its economic impacts. The model of trust, cooperation, collaboration and pooled resources has worked well to benefit the communities and the people who call these communities home.

**About the Authors**

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David Castillo is the Executive Director of the Westside Institute of Technology in Coalinga, California.

**Authors’ Picks for Further Reading**


Pictured: Camilo Ramirez

To date WIT has successfully trained and employed 25 people in Janitorial positions, 50 truck drivers and 95 fork lift operators.
Food Insecurity and Stress
Among Children in the Western United States

BY CRAIG GUNDERSEN AND STEVEN GARASKY

Does family stress contribute to childhood obesity? Are children living in the Western US more apt to be obese than their counterparts elsewhere in the country?

Acknowledgements
Work on this article was supported by the USDA, Cooperative State Research, Education, and Extension Service grant number 2007-35215-17871.

Introduction
Approximately one-in-three children in the US are either obese (i.e., BMI above the 95th percentile for age and gender) or overweight (i.e., BMI between the 85th and 95th percentile). In light of this prevalence and its consequences, childhood obesity has become a critical public health issue. Extensive research has examined the environmental and genetic determinants of childhood obesity. Two environmental factors that have recently been investigated in the literature are the roles of food insecurity and stress (e.g., Garasky et al., 2009; Gundersen et al., 2008a, 2008b, 2009; Lohman et al., 2009.) The relationship with stress is relatively straightforward – children in households experiencing greater stress are more likely to be obese than children in households with less stress (e.g., Garasky et al., 2009). The results for food insecurity are more complex with some studies finding a positive relationship with childhood obesity, others finding a negative relationship, and still others finding no relationship. (For a review see Gundersen et al., 2009.) Some research has investigated interactions. The findings are again mixed with some evidence that stress interacted with food insecurity leads to increases in the probability of obesity and other studies finding stress interacted with food insecurity leading to decreases in the probability of obesity.

To date, the role of geographic location has been missing from this literature. In particular, there has been no work regarding whether living in the Western United States may make children more or less likely to be obese viz. food insecurity and stress relative to living elsewhere in the country. Moreover, no one has investigated whether living in a rural area matters for this issue. In response to this research lacuna, we address the following two questions. First, are children in the Western US at more or less risk of being obese in comparison to those in other regions of the country? Second, are children in the rural west at more or less risk of being obese in comparison to those in non-rural West? In this article, we consider both these questions through an examination of whether the risk factors of stress and food insecurity are more prevalent in the West.

Data
We employ data from the second Child Development Supplement (CDS) of the Panel Study of Income Dynamics (PSID) conducted in 2002. The PSID, begun in 1968, is a longitudinal study of a nationally representative sample of individuals and the families in which they reside. The CDS, a research component of the PSID focusing on children age 0–12 years old in PSID families, was introduced in 1997. The CDS examines a range of developmental outcomes within the context of family, neighborhood, and school environments. The PSID and CDS have four principal strengths for this study. These data provide (1) the full set of 18 questions from the Core Food Security Module (CFSM) which are used in the establishment of official food insecurity rates in the US; (2) the heights and weights of children measured by trained surveyors (rather than being reported by a parent or self-reported) that are used to determine obesity status; (3) a wide array of household-level stress measures including financial stress; and (4) the state and urbanicity (established via Beale codes as discussed in Parker and Ghelfi (2004)) of residence of each responding household.

To measure food insecurity, we use the standard 18-item scale from the CFSM. Each question is designed to capture some aspect of food insecurity and, for some questions, the frequency with which it manifests itself. Examples include “I worried whether our food would run out before we got money to buy more” (the least severe outcome); “Did you or the other adults in your household ever cut the size of your meals or skip meals because there wasn’t enough money for food?” and “Did a child in the household ever not eat for a full day because you couldn’t afford enough food?” (the most severe outcome). A complete listing of the food insecurity questions can be found in Nord et al. (2008).

We examine six categories of stressors using indices based on the number of affirmative responses to questions within each category. More specifically, the stressors and the variables used to create the indices are (1) family disruption and conflict with questions about aggravation...
in parenting, alcohol use, marital status; (2) mental and physical health problems that include mental disability, physical disability, psychological distress, self-efficacy, and self-esteem; (3) housing issues including moving to cheaper quarters, moving in with others, sending a child to live with others, and spending a high share of income on housing; (4) health care struggles such as lacking health insurance coverage and spending a high share of income on health care; (5) financial strain with questions about selling possessions, postponing major purchases, postponing medical care, borrowing money from friends or relatives, filing for bankruptcy, falling behind in paying bills, being contacted by creditor, having wages garnished, having a lien filed against property, and repossession of home, car or other property; and (6) lack of cognitive stimulation and emotional support based on the Home Observation for Measurement of the Environment-Short Form (HOME-SF) scale. For more specifics on how these measures are calculated, see Garasky et al. (2009).

Results

In Table 1, column (1) displays the mean values for each of the variables described above for the Western region of the country. (We use the same categorization of the West as defined by WDRC, i.e., Alaska, Hawaii, Washington, Oregon, California, Idaho, Nevada, Montana, Wyoming, Utah, Arizona, Colorado, and New Mexico.) Column (2) provides values for the other regions. For most of the stressor indices, the mean value in the West is similar to the remainder of the country. The exceptions are that housing stressors are higher in the West (0.29 out of 4.00 versus 0.18) and financial stressors are lower in the West (0.89 out of 1.0 versus 1.20). Additionally, food insecurity rates are substantially higher in the West (14.5% versus 9.1%).

Table 2 is structured the same as Table 1 except that column (1) is for the rural West and column (2) is for the non-rural West. As in Table 1, most index means are not statistically different. However, the stressor measuring lack of cognitive stimulation and emotional support has a higher mean in Western non-rural areas (0.327 out of 1 versus 0.174) while food insecurity is higher in Western rural areas (15.8% versus 0.0%). In interpreting these results, one should keep in mind that the sample size for this study is quite small – 34 households – in the rural West.

Conclusions

Garasky et al (2009) found many of the stressors examined here to be positively associated with childhood obesity. As such, policies and programs designed to reduce aspects of family stress may have a secondary beneficial impact of reducing childhood obesity. Based on these results, policy makers in Western states may wish to pay particular attention to housing issues as housing related stress appears to be more prevalent among families in this area.

About the Authors

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References


Farm to School is seeking a community fix to a community problem. They’re working to combat childhood nutrition concerns while providing access to locally-grown foods.

Introduction
Poor eating, sedentary lifestyles, overweight - these are all part of one of the newest concerns of health providers, the media, the USDA even, and just plain folks from around the nation. And especially as these risk behaviors are affecting our future: the next generation. One third of US children are overweight or obese. As this trend continues, this has been declared as the first generation of children who will not live as long a life as their parents. Nutrition-related diseases such as diabetes and heart disease are being seen in a younger and younger population. Eating in an unhealthy way affects discipline and the ability to learn in school.

What is to blame for this mess? Too much screen time allowed in the home. Lack of physical education at school. Commodity-driven and just plain yucky school food. Schools don’t have the money to buy good foods. The most affordable food in our communities is also the least nutritious. Subsidies for more and more high fructose corn syrup. The lack of awareness about and appreciation of the food that we ingest. The loss of farmers and farmland.

All of these things and more play a role in children not knowing where their food comes from and in less and less reliance on fresh wholesome produce both in our schools and in our family meals.

What is this ‘Farm to School’ anyway?
Farm to School programs throughout the country are bringing local farmers’ foods into school cafeterias (farm to cafeteria), into college cafeterias (farm to college), and are providing a myriad of educational activities that correlate with a change in food choices. Farm to School enables every child to have access to nutritious food while simultaneously benefiting communities and local farm economies. The foods getting into the cafeterias are mostly fruits and vegetables, but also include dairy, grains and meats. These purchases are from local or regional farmers, thus expanding markets for farmers. Other aspects that are frequently in farm to school programs include: taste tests, nutrition lessons, cooking classes, school gardens, farm field trips, and schoolroom visits from farmers. Any educational activity that connects children with local farms can be considered as part of farm to school. Such experiences help children understand where their food comes from and how their food choices affect their bodies, environment, and community.

The National Farm to School Network sprouted from the desire to support community-based food systems, strengthen family farms, and improve student health by reducing childhood obesity. With funding from the WK Kellogg Foundation, the Network coordinates, promotes, and expands the farm to school movement at the state, regional, and national levels. Eight regional lead agencies and national staff provide free training and technical assistance, information services, networking, and support for policy change, media, and marketing activities. Farm to Table and the Southwest Marketing Network are the lead agency for five states in the Southwest. Currently, there are more than 2,000 farm to school programs in the country and chances are there is probably one happening near you.

Farm to School Activities
In New Mexico - There are innovative cooking programs happening in a number of schools. Children learn to use knives and prepare meals with a multi-disciplinary approach, while learning about agriculture and nutrition. Some of these menus are prepared in the school cafeteria and recipes in English and Spanish go home with the students. A directory was produced which links farmers who have food to sell to the schools with the school...
food service buyers who want to buy it, including a local produce seasonality chart and farmers’ market list, all of which helps the buyer venture into this new world of buying direct. Proposed legislation, known as Healthy Kids, Healthy Economy, has been introduced into the state legislature to ask for additional funding to provide two additional fresh fruits/vegetables per week, New Mexico grown when available, to all the state’s children. A group of 6,000 students from 12 schools is piloting the program with great success. In a large urban school district, a new group is forming to coordinate and train garden teachers from all the city’s school gardens. A Produce Needs List was developed that outlines how much of what kinds of products are needed to provide local foods for all school districts.

In Colorado - A Southwest Colorado school district is buying local produce, grains and grassfed ground beef. It is one of the few districts in the country that is buying meat from local growers. Policy councils are forming around the issue of healthy kids and improving school foods. The major metro area is gearing up for a school food service overhaul, which is being accomplished by a large collaboration of organizations.

In Utah - A collaboration between one of the state’s universities, the student farm, and the Nutrition Department has brought on many changes. Elementary age children visit the college farm; the farm’s produce provides for taste tests in the schools; schools purchase produce; there is sharing of produce and recipes for families; and, parent/child food preparation classes are provided.

In Arizona - Several schools and school districts buy local foods. Training is being offered for both farmers and food service directors to help get them connected in the marketplace. Several taste tests, school gardens and other farm to school activities are continuing.

**What can you do?**

You can follow the lead of the state programs that are listed above. You can work big or small. Or you can slice off one small piece of the pie, start with one step, and:

- Teach your kids to both cook and enjoy fresh produce.
- Work with the PTA in your school to build a school garden.
- Volunteer to take care of the school garden in the summer months.
- Share your gardening knowledge with the children in your local school.
- Talk to your legislators and policy-makers about getting more local fresh produce and additional monies to help improve school food.
- Talk to any farmers that you know and convince them that they want to grow and sell food for their local schoolchildren.

**Take a look at these resources, talk to people, and make it happen!**

**About the Author**

Le Adams is a former farmer of organic vegetables from northern New Mexico. She is the Co-Director and the Farm to School Program Director of Farm to Table, a nonprofit educational organization working in farm to school, policy, and agricultural marketing.

**Author’s Picks for Further Reading**

Farm to School
†farmtoschool.org

Farm to College
†farmtocollege.org

Farm to Table New Mexico
†farmtotablenm.org

Southwest Marketing Network
†swmarketingnetwork.org
Can a small store in a rural Native American community offer culturally-appropriate, locally-sourced, healthy food and still make a profit?

Acknowledgement
This project was funded by the Native Peoples Technical Assistance Office, University of Arizona, under the USDA Economic Research Service’s Research, Innovation and Development Grants in Economics.

Cultural Preservation and Commerce: Self-Sufficiency through Local Sourcing
In many rural communities, the only place to purchase food is a convenience store stocked with soft drinks, reheated frozen fried foods, and snacks filled with fats and sugars. Neighborhoods and rural areas with convenience stores have higher rates of obesity, especially in low-income neighborhoods, which usually have little access to diversified food markets. Childhood obesity rates are higher in schools that are located close to convenience stores and fast food service. Yet, the convenience store and gas station complex is often the first business selected by rural citizens for their entry into community economic development.

Sipaulovi Village, located in the Hopi Nation in remote northern Arizona, also chose a gas station and convenience store as the first project for Sipaulovi Development Corporation (SDC), a non-profit organization of the Village. Recognizing the destructive impact that a standard convenience store would have on community health, SDC undertook this research project to find out if a small store in a rural Native American community could offer culturally-appropriate, locally-sourced, healthy food selections and still make a profit.

Although healthy corner stores are more common in urban areas, to date, few Native communities are aware of proven alternatives for stocking and merchandising both healthy choices and fast food. With funding from the University of Arizona, SDC conducted research to develop a model of a “fast food” deli that was based on traditional Hopi ingredients and culture, and was economically viable. The community identified Hopi cultural preservation, support for local commerce, and self-sufficiency as its primary goals.

In addition to testing recipes, sourcing local ingredients, and establishing competitive pricing, the project developed concepts for promoting healthy food purchases through merchandising strategies and in-store education.
Healthy Food
In a series of community focus sessions, participants defined food as “nourishment” and healthy food as “natural, minimal environmental impact, not processed.” The rationale for determining which of the many traditional Hopi foods would be sampled in this project included:
- Seasonal availability of Hopi agricultural products;
- Existing foods that are familiar but not necessarily made too often; and
- Foods not currently on a menu in an existing Hopi restaurant.

The following products were selected for testing and pricing:
- Sakwaviqaviki – Blue Corn Tortilla
- Piklav’kutuki – Roasted Piki
- Somiviki – Sweet blue corn bread
- Hurzusuki – Blue corn bread
- Hohoyi – Wild herbal tea
- Sakwats’tsilosimiviki – Blue corn tamale
- Paatuv’ksi – Hominy and bean stew

The project partnered with the Hopi Elderly and Nutrition Center and staff to create the product recipes that resembled the authentic traditional version in taste, presentation, and portion. The elders at the Nutrition Center provided valuable input, from recipe development to tasting.

Food Samplings
Foods that were in season were selected for sampling. Avenues for incorporating locally sourced ingredients into these traditional-based foods were researched. At food tastings held at community events, a total of 150 people filled out surveys, which yielded the following marketing information:
- 89% reported they would purchase the foods if available in a convenience store.
- 31% reported that taste is what they liked about the traditional foods.
- Hopi foods were considered healthy because they were made with natural or local ingredients (51%), not processed (25%), and not fried or containing fat (16%).

- 84% wanted to know nutritional information about the products.
- 23% would purchase the food one time per week; 22%, seven times; and 9%, three times.

Most people reported that the foods would be eaten in combination with something else, like beans or meats. Some foods like hohoysi and blue corn tortilla would be eaten every day.

The prices that respondents indicated they would pay for traditional Hopi food products in the store deli were commensurate with market prices for fast foods.

Local Sourcing
With these traditional foods as the core menu for the deli, SDC developed a business plan to determine if healthy, locally-sourced food products could be both competitively priced and profit making. SDC’s goal is to purchase food that is grown locally and sustainably.

It was projected that sourcing from local farmers would support Hopi’s agricultural sector and increase availability of reasonably priced fresh and traditional foods. However, the project’s cultural consultants pointed out that Hopi traditional farming practices are not compatible with mass production. Hopi food production and distribution are based on reciprocity within the context of interpersonal relationships and cultural values.

At this time, the project has not determined how, or if, to source locally-grown ingredients in sufficient quantity to meet the demands of a commercial business. Therefore, when a local, sustainable option is not available, or when an item cannot be grown locally, then the next choice is to purchase regionally from small-scale operations. Each sourcing decision will examine the producers’ farming practices for sustainability, defined as: “A practice [which] can be continued indefinitely without degrading the systems and resources upon which it relies.” (Sustainable Food Project, http://www.yale.edu/sustainablefood/food_purchasing.html)

Food Expenditures
During 2004-2005, Hopi consumers spent an average of $9.6 million annually on food. The majority was spent in stores located outside of the Hopi Nation. Items purchased within Hopi were primarily beverages and snacks, averaging $15.34 per trip to the local stores (Natwani 2004, Hopi Community Food Assessment). With dynamic merchandising and marketing, SDC can recapture part of the estimated $7 million annually that is currently being spent on food that is brought in from the border towns.

This project targeted the health and nutrition issues faced by the working poor, which primarily are limited access to healthy foods and limited food dollars to spend. SDC’s model includes market-rate sourcing, pricing, and educational outreach strategies to establish a locally-owned, sustainable, and profitable project that will benefit the community.

Education
Proposed in-store educational campaigns designed to change tastes and purchasing habits include:
- Create dynamic posters and shelf labels that illustrate nutritional value as a function of cost.
- Teach individuals to read labels and how to identify fats, sugars, chemicals, and artificial sweeteners.
- Hold a festival with films like Supersize Me and The Future of Food.
- Hold workshops on how to do a family food budget.
- Teach individuals to do a cost analysis of purchasing habits, including gas, wear on vehicles, and driving time.
- Include menu planning and how to shop for nutritional “bargains” (non processed foods).
- Conduct food sampling so people can taste how quality and freshness in a product is more satisfying and provides greater value for the amount spent.
- Highlight foods in season and pass out recipes to revive yearly anticipation for these traditional foods.
• Design a list of commonly purchased food products with comparative nutritional values per serving cost to help families’ transition to healthier foods. For example, substitute diluted fruit juice for Kool-Aid, or cook a small roast to slice at home instead of buying prepackaged lunch meat.

Conclusion
For the healthy convenience store model to be successful, the selection of foods and consumer education must mesh to result in cost competitive merchandise and healthier choices that support local agricultural producers and the economy. SDC’s promotion of traditional local foods ensures that Hopi dietary needs, cultural food practices, and agricultural traditions are supported with the local food dollar.

Local stores are not just economic enterprises. In a remote rural community, they fill an important community need and can be designed as a tool for public education and shaping healthier food choices. Given the epidemic rates of diabetes and obesity within Hopi and other rural Native communities, the standard convenience store must be transformed into a culturally-relevant community marketplace for sharing and exchange, a place where the people teach each other by reclaiming our traditional foods as everyday foods.

SDC’s primary goal was to find out if meeting cultural, nutritional, and health goals benefiting the working poor could be financially sustainable. Based on the data analysis and project findings, the answer is, “Yes.”

About the Investigators
Sipaulovi Development Corporation, Inc. is a non-profit corporation of Sipaulovi Village, Hopi Nation, Second Mesa, Arizona. The investigators included Susan Secakuku, Isaura Andaluz, and Suzanne Jamison; with Raymond Namoki, Delwyn Takala, and Hopi elders.

Author’s Picks for Further Reading

Educating a community about using year-round, locally-grown foods.

The farmers who sell at the Auburn, California Farmers’ Market, like farmers at markets across the state, are caught in a tricky situation. While there are plenty of shoppers during the peak of the summer growing season, the numbers dwindle dramatically when cool weather hits. Farmers were not planting crops for sale during the winter months because many customers think there isn’t much in the market between November and April. In addition, it’s a mystery to market customers to know how to prepare various root crops, cruciferous produce, or the many ways to serve persimmons, Asian pears, or citrus. Laura Caballero, a local chef, and Joanne Neft, a driving force behind the first eight farmers’ markets in Placer County, decided to change that by writing a totally local in-season healthy food cookbook inspired by fruits, vegetables, greens and meat purchased at the Auburn Farmers’ Market. The first meal was prepared and served on January 5; the last meal will be served on December 28. 52 weeks in 2009; 52 Monday night dinners.

Every Saturday morning throughout the year Laura and Joanne meet early at the local farmers market to learn what’s available that week. After circling the market once, the discussion focuses on what meats, fruits, vegetables and nuts are available, what foods taste good together and provide a colorful plate. Generally there is a nice selection of lamb, beef, pork, chicken, goat, and even fresh fish caught in Bodega Bay. And, of course, in Placer County throughout the year we are fortunate to grow seasonal fruits and vegetables. Enough food is purchased for eight people since all the cookbook recipes serve eight.
Malcolm Gladwell in “The Tipping Point” suggests it takes 150 people to get the buzz going on an idea or product. On January 7th a short email went out inviting four guests to come to dinner at Joanne’s house on Monday evenings. A donation of $20/person was suggested to support costs of printing the cookbook. And if people wished to drink wine with dinner they were asked to bring a bottle. Apparently email recipients forwarded the email to friends; surprisingly, by mid-February every Monday night dinner was booked for 52 weeks. Four to six people coming to taste local food over 52 weeks totals more than 250 guests.

At four o’clock on Monday afternoon Laura arrives and the cooking begins. If lamb shanks or beef stew is the main course, the initial preparation began a few hours earlier to allow enough time for slow cooking and the slower the cooking, the tastier the meat.

As each recipe is prepared, careful notes are taken of techniques as well as to measure amounts of food, liquids, spices, seasonings and cooking times. Caballero and Neft are intuitive cooks – a dash here, a splash there, and if something needs a spike in flavor, add some herbs or zest, so measuring amounts has been the most difficult part of writing the cookbook.

A photographer arrives at 4:30 or 5:00 p.m. to take pictures of meal preparation. He captures slicing and dicing, basting, roasting, pouring, simmering, and tasting. Photos are taken of the week’s fruit or vegetable table centerpiece, and a large number of decorative natural materials have been photographed through the seasons. Incidentally, the photographer stays for dinner – one of the perks of the job.

The four to six dinner guests arrive at 6:00 p.m. and many times comment on experiencing the friendly cooking smells as they come down the long steps. Who doesn’t remember the good feelings and sense of well-being from smelling baked bread, or a fresh apple pie, or a pot roast on the stove?

After a seasonal appetizer the guests gather around the long refectory table and await big platters of fresh-from-the farm food. The meal is served family style and guests are excited about getting their first peek at the food and holding a platter for someone else to dish up a plate. Serving the meal family style has been a unique experience for many guests. Over the years people have forgotten to appreciate the generous spirit shared when meals are served family style. For many it brings back memories of big family dinners and gatherings.

Dinnertime conversation focuses on the food – how it was prepared, which farmer grew it, how long it will be in season, and which oils or seasonings enhance the taste. The recipes are all very simple; the goal is to let the meat or vegetable or fruit reflect its true flavor. Nothing tastes better than just-picked produce; there is no reason to alter it.

During the year over 300 guests have eaten at Neft’s house at special events or Monday night dinners. Inviting community members to share dinner has many rewards. When on the following Saturday morning dinner guests show up at the farmers market, it’s a clear message they enjoyed what they tasted and have decided to continue eating good food. Guests are spreading the word about eating locally grown food and the cookbook buzz is happening.

The Placer County real food cookbook will be available in time for Mothers Day 2010. A cookbook-launching event at an old packing shed in Loomis is scheduled for mid-April. All dinner guests will be invited. Attendees will be asked to bring an in-season dish to share, something made with locally grown food. It promises to be a celebration of good food, good friends, and a healthier community.

A group of PlacerGROWN food aficionados is laying groundwork for a real food Cook Club. Pods of eight or sixteen participants will gather together on a semi-weekly or monthly basis to prepare the recipe of the week. The goal is to develop larger attendance at weekly farmers’ markets as well as introduce people to the benefits of eating healthy food.

About the Authors
Joanne Neft is a PlacerGROWN advocate.
Laura Caballero is a Professional Chef.

Authors’ Picks for Further Reading
Omnivore’s Dilemma, Michael Pollan (Paper: 2007 by Penguin)
Animal, Vegetable, Miracle: A year of Food Life by Barbara Kingsolver (Paper: 2008 by Harper Perennial)
The Tipping Point, by Malcolm Gladwell (Paper: 2002, First Back Bay)

YouTube Video: Placer County real food
eatwild.com
grassfedcooking.com
Food Security in the Western US and Pacific Territories

BY PETER BARCINAS

ADAP is tackling the food security implications of climate change, rising sea levels, and fuel costs for the Western US and Pacific Territories.

The recent launch of the Agricultural Development in the American Pacific (ADAP) Regional Food Security and Sufficiency Project brings together community, local, state and regional expertise around a common high-impact programming or participatory governance to:

- Develop an integrated program that allows community members to make informed decisions about a healthy diet through sustainable, backyard agriculture.
- Match appropriate agricultural technologies to community and island needs.
- Identify government level challenges to sustainable region-wide agriculture, such as trade tariffs and agricultural water rights.

This collaborative programming signature serves as a useful and effective cultivating tactic allowing regional teams to address common area issues with emphasis on the human and education side. This capacity development strategy continues to support the need to establish a series of complimenting regional food policies sensitive to the areas diverse food system.

While the issues commonly associated with food supply can cover a broad area, food production represents a small but important part in this forum. The ADAP-led effort attempts to align the Food Security and Sufficiency projects programming framework. A noted interest lies in threats associated with food supply interruption and high reliance on the volume of imported foodstuff.

The focus on Food Security represents the latest effort toward localizing and embracing the overarching idea of the “ecological footprint” as referenced in Kent’s (2008) forum presentation “Food Security in the Western US and Pacific Territories.”

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and Nutrition Security in the United
States-affiliated Pacific Islands.” This
ecological reference provides the broader
and challenging context of defining the
agricultural interest amid the myriad of
causes driving resource consumption and
known ecology pressures. This also includes
expanding the circle of food security
advisers from the current workgroup
represented in the forum. Participants include
a food security expert, administrators,
program leaders, economists representing
both Research and Cooperative Extension
and University/college programs and
collaborators. This initializing workgroup
contributes toward identifying and
expanding the related food-agricultural
assets and expertise necessary to address
the issues identified by the team. The joint
sponsorship represents a commitment to
unify common issues noting Food Security
as one focus area. Other emphasis areas
include climate change, energy security,
invasive species and biological threats,
and health and lifestyle impacts.

The highlights of the November 2008
Food Security meeting forum focused on
three areas: Availability, Accessibility and
Use. As a starting point, each cooperating
area will conduct a community assessment
and compile their respective version of a
food-system asset map. The community
assessment will provide the necessary
background and information to gain an
understanding of the issues making up the
region’s food security and sufficiency issues.
Addressing dependency issues around
food and more importantly, the questions
of where is the next food source coming
from and how to improve our current food
security system remain important concerns.

In Guam’s case, creating a food security
monograph, which will evolve from
the initializing assessment efforts, will
provide a better sense of data needs and
understanding the island’s food system. The
implications of climate change reframes a
role that the ADAP consortia has a natural
advantage to serve as the early warning
system related to rising sea level threats
and the associated fuel issues influencing
imported foods. Other concerns expressed
include understanding food production
practices and associated ecological drivers
supporting each jurisdiction as well as
considering other transformative strategies
and opportunities not readily apparent as
a result of these ecological pressures.

From this Food Security effort, the
workgroup through ADAP and the PGLA
hope to create start points for food security
strategies. Such strategies should address
current food systems for the alliance and
decide common accessibility issues related
to the at-risk or marginal groups to food.
This includes a similar interest in defining
a food uncertainty strategy associated
with disasters and readiness action plans.
Perhaps this recent interest around food
security can serve as the front-runner for
leading the regionalization of agricultural
programs that can lead toward shoring up
both the knowledge base and capacity for
timely Pacific Alliance programming.

An important concern raised in this forum
is who exactly leads this and why. For
Guam, from this printing, a food security
workgroup comprised of dedicated and
highly charged faculty, program staff
and graduating seniors are underway
in developing a program design and
conducting its food security community
reconnaissance to include a food security
focus group and a Food System asset map.
The workgroup remains excited and looks
forward to this important work effort and
creating its first food system monograph.
Agricultural Development in the American Pacific Food Security Projects

The College of Micronesia (COM) project staff are working to revitalize a traditional crop and farming system. Traditionally, Micronesians grew root crops in a way that should the island be inundated with storm surge, and the farms flooded with seawater, there were a few hardy varieties of plants that survived and would sustain the community. Due to the threat of rising sea levels, this work is even more important. Last year the staff began propagation of plantlets of the hardiest varieties of sweet potato, taro, and other staple root crops, for distribution to outer island communities in the Republic of the Marshall Islands, and the FSM States of Pohnpei, Chuuk, and Yap. This year, COM plans to continue the propagation and distribution of plantlets to the smaller, outer islands in the region. Distribution of the plantlets will be accompanied by a workshop on gardening techniques.

About the Author
Peter R. Barcinas, Program Leader, Economic and Community Systems, University of Guam Cooperative Extension Service. Mr. Barcinas continues to participate in many regional forums and initiatives that range from workforce development, capacity building and strategic planning and community asset mapping efforts.

References


Pacific Land Grant Alliance. [Brochure]. c/o ADAP Home Office College of Tropical Agriculture and Human Resources, Hi.

College of Micronesia
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References


Pacific Land Grant Alliance. [Brochure]. c/o ADAP Home Office College of Tropical Agriculture and Human Resources, Hi.
University of Alaska Fairbanks

The project staff at the University of Alaska Fairbanks are focused on several projects including 1) gathering primary data from food importers to determine amount by weight and value (where possible) and by major food category (e.g. potatoes, onions, bread, beef etc.) shipped into Alaska from outside its borders; 2) gathering detailed information of production from greenhouse operators that is not currently collected by the Alaska Agricultural Statistics Service; and 3) gathering secondary information on consumption in rural and urban Alaska including calculating consumption using consumption coefficients for the United States. College staff will publish the results of the information gathered concerning the amount of food that is imported into Alaska and the vulnerability of the Alaska population to any interruption in the food supply chain. It is also planned to coordinate two workshops in Anchorage and Fairbanks and a media campaign (radio and television) to show people the importance of some degree of self-sufficiency that will reduce the amount of food imports and give helpful hints on what everyone can do to help. This year UAF plans to support two additional workshops and media outreach for Juneau and the Kenai Peninsula. Also, in June 2010, food importers and distributors identified in surveys will be contacted again for updated figures on food imports to Alaska.

Northern Marianas College

The project staff at Northern Marianas College (NMC) sponsored an agriculture summit to discuss emerging concerns relative to food production. At the conclusion of the agricultural summit, CNMI will have an agriculture strategic plan. NMC will develop the expertise of the local extension agents in aquaculture and farming to be able to provide the necessary expertise to assist in the development of the agriculture and aquaculture industries. This year NMC plans to further assist in the development of both agriculture and aquaculture by building a small aquaponics demonstration plot. Aquaponics has the potential to be very useful in Saipan, where all freshwater comes from wells and all fertilizers are imported. By combining the two systems, a sustainable system can be created that optimizes water use and minimizes the need for importing fertilizers.

University of Hawaii

Project staff at the University of Hawaii created point-of-purchase signage allowing growers to identify where products were grown in the Islands. Besides price, one of the other reasons that there is not a demand-pull for locally-grown produce is that many consumers cannot easily identify products that are grown in Hawaii – products are not often labeled by origin. This has changed a little, due to the Country of Origin Labeling law, but farmers themselves are not in tune with promoting their product over an imported one. This work compliments the ongoing Hawaii Farm Bureau Federation’s Buy Fresh – Buy Local campaign. Signs, for various uses and of various sizes, will be developed by this project for use by Hawaii growers and retailers. The templates will be available for anyone who wishes to buy additional signs. This year, University of Hawaii hopes to expand the program to growers in Hawaii (both on Oahu and all neighbor islands).

The PGLA is comprised of the six US Pacific Land Grant institutions. The Alliance theme “Pacific Gateway communities, environments, and economies in harmony” captures the essence of the membership which includes: the American Samoa Community College-Community and Natural Resources, College of Micronesia-Land Grant Programs, Northern Marianas College-CNMI Cooperative, Research, Extension and Education Service, University of Alaska Fairbanks-School of Natural Resources and Agricultural Sciences Agricultural and Forestry Experiment Station, University of Guam-College of Natural and Applied Sciences, and University of Hawai’i at Manoa- College of Tropical Agriculture and Human Resources makes up the current PGLA consortia and serves as the latest addition to the organizational map.
Researchers at University of Alaska Fairbanks have developed an early-maturing, non-waxy barley that is specifically adapted to northern climates.

A new variety of barley is nearly ready for public use in Alaska. The University of Alaska Fairbanks School of Natural Resources and Agricultural Sciences, Agricultural and Forestry Experiment Station are releasing it. This “naked” barley, dubbed Sunshine by researchers, is a hulless type featuring a tough inedible outer hull that loosely adheres to the kernel.

Hulless barley is not truly without a hull, but is so called because this type of barley requires little or no processing to remove the hull, as it is attached so loosely to the seed that it easily falls off during harvesting. Research that eventually led to the creation of the variety Sunshine began in 1993—barley has been studied at AFES since practically the beginning of work at the station. Research Assistant Bob Van Veldhuizen has been working on the new barley variety for many years, with
other researchers on the quest to create a hulless variety for Alaska conditions along the way. Steve Dofing started the process fifteen years ago and then Charles Knight took up the work. Using Thual as the parent seed, Dofing crossed the barley with a Finnish variety (JO1632) to improve straw strength, as Thual tended to produce weak stalks which fall over in the field, scattering the grain on the ground.

Dofing spent many days peering through microscopes to learn everything he could about all aspects of the grain. Once the trials passed the greenhouse research phase, fields were planted at the Fairbanks Experiment Farm, the Matanuska Experiment Farm in Palmer, and the Delta Junction Field Research Site.

This early-maturing, non-waxy barley is specifically adapted to northern environments. Sunshine possesses high grain yields of nearly 2,500 pounds per acre and good test weights of 57 pounds per bushel.

Kitchen tests followed the field trials, with Cooperative Extension Service testing twelve barley varieties. Nutrition expert Kristy Long determined that Sunshine was indeed a marketable product, easy to mill, with a nutty flavor, and containing an abundance of nutrients. Once farmers decide to grow the product, they should find that compared to the price of hulled barley varieties ($100 to $200 per ton), Sunshine should bring in $5 to $10 for a one-pound bag.

“We want to show growers the possibilities of uses for Sunshine barley,” Van Veldhuizen said. “In Alaska you almost have to create the product yourself as we don’t have industries to do it.” He foresees some demand for the grain from health food enthusiasts. “I doubt there will be 100,000 acres of it in Alaska but I see a niche,” he said. “There will be small acres, small plots. And the demand might increase once people see it’s great.” Another plus for barley is that the flour is much lower in gluten than wheat, a plus for people with certain allergies, but it is not entirely gluten-free.

An official announcement of the new crop will appear in the Crop Science journal and a publication will be prepared by AFES. Foundation seed will be available through the Plant Materials Center, Alaska Department of Natural Resources in Palmer. Breeders’ seed is maintained by AFES.

Since the barley was announced publicly, there has been an outpouring of interest from growers both in and out of Alaska. Van Veldhuizen has been answering questions and taking names for those who want trial seed once it is released.

In the meantime, Van Veldhuizen is anything but bored; he has already developed a new and improved breed of sunflower (Midnight Sunflower) for Alaskans and is immersed in researching organic amendments to soil, fishmeal and fish/peat composting, and testing for many new plant varieties.

About the Author
Nancy Tarnai is the Public Information Officer for the School of Natural Resources and Agricultural Sciences at the University of Alaska-Fairbanks.

Nutrition expert Kristy Long determined that Sunshine was indeed a marketable product, easy to mill, with a nutty flavor, and containing an abundance of nutrients.

Pictured: Bob VanVeldhuizen, Sunshine Barley
A community group provides garden plots for those who otherwise don’t have access to land or don’t have the ability to prepare their own garden.

Gardeners for Regional Organic Wellbeing (GROW!) was founded in the winter of 2008-09 by community members that were interested in promoting food security for Boundary County, Idaho. To address the issue of nutritious and safe food for those that might not be able to purchase such fresh vegetables, this grassroots organization formed the idea of a community garden to provide food to both the food bank that is often lacking in fresh produce and local gardeners interested in producing their own vegetables.

The goal of GROW! is to create a self-sufficient, food independent community by supporting local and regional food security systems and agricultural practices that enhance the ecological independence and economic sustainability of Boundary County. It is also the mission of the organization to bring the community together to realize the connections that can be made within the community to further enhance its wellbeing.

GROW! spent the winter months planning for the project and the group constructed its community garden with 31 plots for community members, seven plots for the GROW! Organization, and two plots for educational demonstrations. At a cost of $20 per plot, community gardeners received a four-foot by twenty-foot garden space that was tilled and amended with compost. The gardeners also received access to water, hoses and gardening tools for maintaining their gardens through the summer. A scholarship program was set up and utilized to waive the $20 fee for those gardeners that might not be able to afford it. GROW! also provided its community gardeners with free seeds that had been donated and transplants started by group members.

The garden has been a great success, offering apartment dwellers or others that live in much cooler climates in the mountains a location in the city of Bonners Ferry for growing a wide range of vegetables. The garden spaces have also been well utilized by those who are unable to do the heavy work needed to start a garden. Colleen Bolles is one such gardener who is participating in the community garden. “I rented the garden plot to learn about gardening and because I needed someone else to do the heavy work like tilling, adding manure, and building a fence,” said Ms. Bolles. “I learned by doing and by asking other gardeners at the community garden.” Now Ms. Bolles is enjoying the harvest from her bountiful garden plot.

Beyond the Garden
The group is especially concerned with providing healthy food for underprivileged families within the county. Between the seven GROW! plots in the community garden and another separate garden, the group is able to provide fresh fruits and vegetables to the local food bank. Some of the produce is also sold at the Bonners Ferry Farmers’ Market the proceeds of which are used to purchase commodities such as flour, rice, sugar, etc. to donate to the food bank.

Christine Villanueva is the service coordinator for the Community Action Partnership that runs a food bank in the city of Bonners Ferry, Idaho. “The donations
from the community garden have been a great help,” says Villanueva. According to her, more families utilize the services at the food bank in the summer when school is out of session. During the summer months these families lose two free lunches a week for their children that are offered during the school year at the school’s cafeteria. Fortunately other gardeners in the area also generously donate some of their harvest to the food bank. “The donations from the community garden make a great impact on the community,” said Ms. Villanueva, “By providing fresh vegetables to those who are unable to grow their own garden and can’t afford to purchase produce at a store.”

Educational Outreach
GROW! has worked with the University of Idaho Extension to provide educational opportunities relating to local food security. An in-class workshop for 4th and 5th grade science students at Evergreen Elementary School took place in the spring of 2009 to help start seedlings for the garden. The class planted tomato, basil and marigold seeds. Many of these plants were then transplanted into the community garden and others were reared under grow lights at the school for the students to take them home for use in their own gardens. During the workshop the students learned about the history of community gardens, and discussed tomatoes and why there are so many different cultivars available. In addition to providing in-class workshops, GROW! offers hands-on learning opportunities at the community gardens. These garden workshops focus on enhancing local food production and have included:
- Basic gardening practices
- Edible container gardening
- Building a successful compost bin
- Weed control and mulching in a vegetable garden
- Storing garden vegetables for use through the winter

The garden staff set aside one demonstration plot that was used to educate students from the Riverside High School in Bonners Ferry on planting techniques. Another demonstration plot featured 13 tomato cultivars for gardeners to evaluate plant performance and taste.

Conclusion
The GROW! Community Garden has been a great success this summer. An empty, grassy lot has been converted into a beautiful garden that is providing fresh and local produce to the community. Flowers flank the front fence and brighten many of the garden plots and a seating area in the garden provides rest for anyone who would like to sit and enjoy the splendor. In 2010 GROW! plans on expanding to include other gardens in the county with the intent of moving another step closer to the goal of a self-sufficient, food independent county.

About the Author
Jennifer Jensen is an Extension Educator with the University of Idaho Extension in Bonners Ferry, Idaho.

Author’s Picks for Further Reading
GROW! (growboundarycounty.org)
American Community Gardening Association (communitygarden.org)
Brooklyn Botanic Garden All-Region Guides Community Gardening. Edited by Ellen Kirby and Elizabeth Peters.
Rebuilding the physical and social connections between people and their food producers, Consumer Supported Agriculture is growing in urban areas like Utah’s Wasatch Front.

The Great Salt Lake Resource Conservation and Development (RC&D) has worked to teach others about the importance of Community Supported Agriculture (CSA) to serve the needs of consumers by providing fresh, locally-grown produce and encouraging a varied and balanced diet while preserving farmland and encouraging sustainable farming along the rapidly developing Wasatch Front.

Farms in Utah are working to increase the viability of their operations by diversifying
and marketing directly to consumers using a CSA model. By working collectively, farmers will be able to increase the effectiveness of educating consumers about the benefits of CSA through collaborative marketing, brochures, displays, signage, packaging and labeling, training, sponsored events, workshops, and evaluation of results.

After giving this program an identity, CSA Utah, the GSL RC&D started an intensive outreach effort. The marketing component has been the prime focus of this effort which includes contracting with a professional graphic artist to create a unique and interesting logo, creating a descriptive and memorable slogan (CSA Utah: Rooted in Your Community, Harvested for Your Table), underwriting sponsorships that were recorded on several radio stations that broadcasted to many parts of Utah, purchasing graphic advertisements in traditional and nontraditional publications with both large and small readerships as well as a diverse range of audiences.

The GSL RC&D volunteer members worked to ensure the program has a presence along the Wasatch Front as well as the rest of Utah. Other incentives to increase the capacity of CSA in Utah for both the supply (farmers participating in CSA in Utah) and demand (consumers or shareholders) sides included paid attendance to workshops (Utah Diversified Agriculture Conference in Delta, Utah), cost share funds for CSA related equipment, packaging and labeling (reusable bags printed with the logo and byline of CSA Utah), as well as a website and blog. The vast majority of this successful and growing program has been funded by a generous grant from the USDA Agriculture Marketing Service Farmers’ Market Promotion Program.

By diversifying and directly marketing to consumers, local independent farms and partners hope to grow the market share for CSA thereby creating an important relationship with customers by educating them about how their food is grown, where it is produced and who is responsible for bringing fresh, locally produced fruits and vegetables into their homes and onto their tables. The GSL RC&D hopes to educate and encourage one percent (initially) of the over 1.6 million people residing in these five counties to participate in CSA. This would equal over 16,000 consumers participating in CSA, and increase of over 14,000 more than currently participates in this fledgling effort. This joint effort to keep a locally grown food supply close to a large metropolis center has been successful but has a lot more work to ensure it meets the ever changing economic landscape of Utah.

This effort has been on-going for a number of years, but recent funding has infused the program with tangible resources to meet the challenge of connecting people with their environment, gain a better understanding for how and where their food is grown, and providing them a meaningful action that invites farming into their community. In addition, CSA gives farmers another tool by which to market their products while giving them a closer to retail price thus increasing their chances of remaining a viable agricultural entity. To date, the number of CSA farms has almost doubled from last year. The website has recorded almost 4,000 hits to date. The main purpose of CSA Utah is to provide a place for consumers to find out about CSA farms in Utah, as well as place for farmers to educate potential shareholders about what their CSA offers.

However, there is still a large portion of the population in Utah that could benefit from participating in CSA as either a consumer or grower. There is also the challenge of making CSA accessible to low income and diverse audiences. Growing farmers along the Wasatch Front is a need that will become more challenging and critical as the average age of farmers continues to increase and farmland comes under more pressure from development. A beginning farmers program would help provide more opportunities for more local farms located in close proximity of new developments. Further funding for CSA Utah will help these and other opportunities and challenges associated with CSA in Utah.

CSA Utah is one of many ways that local farmers can market their goods and services in a way that will increase the diversity and sustainability of their operations. Consumers can make a positive difference in their communities by supporting a local farm. This connection, both physical and social, between producer and consumer is becoming less common in our economic world. CSA may increase the likelihood that farmland will be preserved even in the most developed areas. Shareholders can enjoy the many benefits, such as a varied and healthful diet, decreased transportation costs, having a voice in what and how their food is grown, and more.

About the Author
Jeff Williams is a Resource Conservation and Development (RC&D) Coordinator for the Great Salt Lake RC&D Council, USDA Natural Resources Conservation Service (NRCS) in Salt Lake City, Utah.

Author’s Picks for Further Reading

Alternative Farming Systems Information Center
nal.usda.gov/afsic/pubs/csa/csa.shtml

CSA Farms Management and Income
clas.wisc.edu/economics/community-supported-agriculture-farms-management-and-income/

CSA Utah
csautah.org
Researchers at Rutgers University and Bryn Mawr College are helping farmers identify the top native pollinators in their area and how to support them.

The Impact of Colony Collapse Disorder

Insect pollination is an essential agricultural input: the world is dependent on insect pollinators for 35% of its food supply and two-thirds of crop varieties require some level of animal-mediated pollination (Klein et al. 2007, Roubik 1995). This pollination service, almost exclusively due to the activity of bees, is highly valuable and generates an estimated $18 billion annually in the US (Morse and Calderone 2000, Losey et al. 2006). Bees efficiently transfer pollen between different plants of the same species. This cross-pollination makes for healthier and more genetically diverse plant populations. It also facilitates reproduction for crops such as watermelon, which have separate pollen providing (male) and fruit producing (female) flowers, or apples, many varieties of which require cross-pollination from a different variety (called self-incompatibility) to produce fruit.

Commercial growers of entomophilic (or insect-pollination dependent) crops depend heavily on rented honeybee colonies to fulfill their pollination service needs. When in 2006 US honeybee populations began to crash in a startling trend now known as Colony Collapse Disorder (CCD), the agriculture industry became deeply concerned. Though the cause of CCD is mysterious, the phenomenon highlighted the risk of relying on a single pollination service provider (honeybees) for commercial crop production. Severe economic losses and food shortfalls could result if pollination service loss is not addressed.

Apples, blueberries, strawberries and various nuts, all crops that generate billions of dollars annually for the US economy, require from one to three honeybee colonies per acre to maximize fruit production (Blossom to Harvest 2005). Almonds, California’s top agricultural export, are completely dependent on insect pollination for reproduction due to self-incompatibility, and bring $1.9 billion into the state each year (Kodad 2008, Almond Board of California 2008). In part due to declining honeybee numbers, California honeybee colony rental costs have increased three-fold since 2001 (California Agricultural Statistics Service 2007).

Costs of honeybee hives will continue to rise if CCD and other hive management problems continue, requiring that farmers spend more revenue on a less reliable input. If farmers rely exclusively on honeybees, the availability of pollinator-dependent foods may become more irregular or they may simply become economically inefficient to produce (Allen-Wardell et al. 1998).
Advocating on US Farms... on farms:

There are three components of implementing the Three Strategy Components (see “Native Bee Benefits”).

In order to locally promote this strategy, a group of researchers from Rutgers University and Bryn Mawr College quantified the presence and visitation rates of 78 native bee species on 29 farms in Pennsylvania and New Jersey. Their data, along with previous studies, were used to rank native bee populations, simultaneously compensating for lost pollination services and increasing insect biodiversity on farms.

The first component involves planting a mix of native flowering plants around the farm, especially in marginal land such as in ditches, along the sides of roads and paths, or on steep hills near the crops needing pollination. Increasing suitable habitat in these areas is highly successful at encouraging bee nesting, with a 135% increase on average in number of bees found in restored roadsides from those found in non-restored sites (Hopwood 2008).

The second component entails providing preferred nesting substrates near foraging resources. Depending on the bees one is trying to attract, three different kinds of nesting substrates will need to be provided: wood, suitable ground areas, and pre-existing cavities. It is important to keep in mind that foraging resources should be planted within the flight range of the bees’ nesting sites, which varies from as little as a few hundred yards for small sweat bees such as Lasioglossum to over four miles for large bees like Bombus (bumble bees).

The third component requires that farmers know how different land management strategies can affect bee populations, including which pesticides and herbicides (if any) to use on their crops. These chemicals can negatively impact bees, both when sprayed directly on them, and when collected by bees from sprayed flowers. The former can kill a bee immediately, but the latter contaminates the food supply of the entire hive if brought back by foragers, killing many bees or the brood over a period of weeks (Delaplane 2000). Highly targeted application is more likely to limit bee exposure. In general, granules and solutions are safer than powders, which certain bees may confuse with pollen and collect as food (Delaplane 2000).

Conclusion

The current outreach efforts mentioned above are based on locally obtained data and are relevant mainly to growers in the Pennsylvania and New Jersey region. Similar efforts are going on in Michigan, California and elsewhere. Nationwide implementation of this strategy requires replication of the research done on Pennsylvania and New Jersey pollinator communities (see Winfree et al. 2008) throughout the US such that farmers in all parts of the country can benefit from knowing the top native pollinators in their area and how to support them. Researchers can help by carrying out these studies and farmers have a role in implementing targeted bee habitat restoration based on the studies’ results. These efforts can help ensure secure, sustainable and affordable production of a huge variety of cash crops including apples, watermelon, peppers, tomatoes, berries, nuts, and even soy.

About the Author

Emily McGlynn is a Research Assistant with the Ecology Lab at Bryn Mawr College in Pennsylvania.

Author’s Picks for Further Reading

Hive management problems continue, requiring that farmers spend more revenue on a less reliable input. 

Costs of honeybee hives will continue to rise if CCD and other hive management problems continue, requiring that farmers spend more revenue on a less reliable input.
The most efficient native bees for top regional fruits and vegetables.\textsuperscript{12,13}

All these bees are good pollinators, but three stars (***)) indicates a key pollinator for that crop. Supporting a variety of bee species will help maintain reliable pollination of crops season after season. A good goal would be to attract as diverse a collection of bees as possible.

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<tr>
<th>Bee Species</th>
<th>Apple</th>
<th>Blueberry</th>
<th>Cranberry</th>
<th>Cucumber</th>
<th>Muskmelon</th>
<th>Pepper</th>
<th>Squash</th>
<th>Strawberry</th>
<th>Tomato</th>
<th>Watermelon</th>
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<td>Apis mellifera</td>
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<td>Halictus confusus</td>
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<td>Lasioglossum (Dialictus)</td>
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<td>Peponapis pruinosa</td>
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<td>Xylocopa virginica</td>
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**Bee importance for crop pollination**
- * Good
- ** Better
- *** Best

How do I attract these bees to my farm?

There are two key things that would likely increase support for native bees on PA and NJ farmland:
- Grow recommended native plants that studies have shown are preferred by bees in order to attract more pollinators to your property (see page 6).
- Establish areas of suitable pollinator habitat around the farm. This will allow more bees to nest on your property and encourage their return year after year (see page 7).

The rest of this pamphlet provides guidelines for what you can do to make your farm a bee haven.

Excerpt from “Native Bee Benefits” pamphlet. Available for download at beebiology.ucdavis.edu/NATIVEBEES/index.html
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