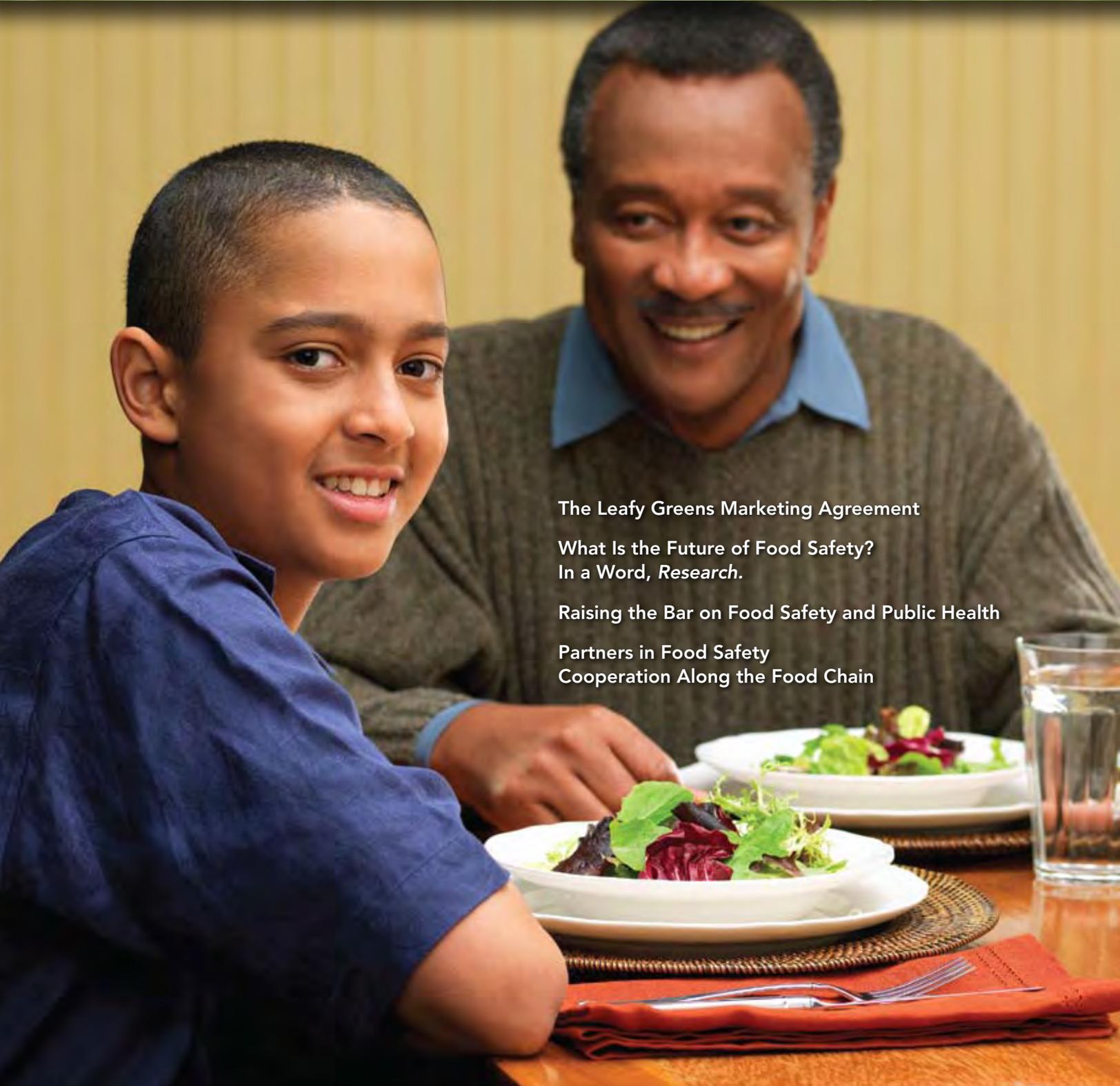


California Department of Food and Agriculture

CALIFORNIA AGRICULTURAL RESOURCE DIRECTORY 2008–2009



The Leafy Greens Marketing Agreement

What Is the Future of Food Safety?
In a Word, *Research*.

Raising the Bar on Food Safety and Public Health

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Cooperation Along the Food Chain



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Letter by

Governor Arnold Schwarzenegger

Foreword by

Secretary A.G. Kawamura

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A LETTER FROM GOVERNOR ARNOLD SCHWARZENEGGER

Dear Friends,

California is a leader in the world of agriculture and food markets. Our hardworking farmers and ranchers continue to harness new technologies and innovative on-farm practices, allowing them to produce commodities renowned for being safe, healthy and nutritious. These dedicated men and women contributed to California's record-setting \$36.6 billion in on-farm sales for 2007.

Among the 400 commodities grown in our fertile soils, California accounts for 50 percent of the U.S. fresh-market vegetable production. As the nation's leading fresh-market vegetable producer, maintaining a safe food supply is of paramount importance during all stages of food production—from the growing season and harvest to post-harvest, storage, transportation, processing and distribution. In other words, from farm to fork, the production of safe food is the primary responsibility of all those who produce, process and trade in food.

This year's *California Agricultural Resource Directory* outlines the California Department of Food and Agriculture's role in conducting compliance audits of leafy greens growers as well as the industry's extensive efforts in managing on-farm food safety.

My administration is committed to raising the bar on food safety all along the food chain with the aim of mitigating foodborne illness and protecting consumers. The key is to strengthen each and every link in our complex food system through a rules-based policy and a regulatory environment,



working in cooperation with other state and federal agencies and the food production industry. This approach includes the adoption of good agricultural practices that establish basic principles for farming, including soil and water management, crop and animal production, storage, handling, processing and waste disposal.

California's rigorous set of food safety practices have indeed set the bar high and are leading the nation. I encourage you to use this directory to learn more about the policies that are contributing to our agriculture's success and to see why California-grown produce is considered the nation's "first choice."

Sincerely,

A handwritten signature in black ink that reads "Arnold Schwarzenegger". The signature is written in a cursive, flowing style.

Arnold Schwarzenegger

FOREWORD

By A.G. Kawamura, Secretary

As the secretary for the California Department of Food and Agriculture, I am committed to protecting not only our agricultural resources but also a safe and healthy food supply and a sustainable environment. Indeed, it is impossible to have the one without the other.

This year's *California Agricultural Resource Directory* focuses on food safety. We recognize the concerted efforts of governmental regulatory and health agencies, university and industry scientists, food safety experts, farmers, shippers and processors as they continue to dedicate themselves to improving and fine tuning the remarkable food systems of California.

In March 2007, the state's leafy greens industry created a government auditing and inspection program under the California Leafy Green Products Handler Marketing Agreement (LGMA). Signatories of the marketing agreement must submit to mandatory and randomly conducted inspections of their operations based on good agricultural practices that have become a model for leafy greens farmers in other states. The LGMA now represents more than 99 percent of the volume of lettuce, spinach and other leafy greens grown in California. As a marketing agreement, this structure enables the signatories to constantly upgrade their best practices in a timely manner, driven by the ongoing science and research of foodborne illnesses and diseases.

The LGMA companies provide leafy greens—both raw and processed—to the nation's grocery



stores, restaurants and institutions. Since California produces 78 percent of the nation's lettuce, the LGMA program is a cornerstone in our work to keep the nation's food supply safe. You'll read how the program is ensuring the internal integrity of field audits and how the industry is investing in improvements to their food safety practices.

Food safety for California agricultural products is of the highest priority. All of the stakeholders who produce and consume these fine farm products have a responsibility to understand and support best practices in the field, the marketplace and in the home. When we all understand the incredible work that takes place to deliver a meal to a table, we can then all work together to guarantee and better appreciate the wonderful food supply that is California Grown!

The Leafy Greens Marketing Agreement

Protecting a Cornerstone of Cultural Expression

By JonnaLee Henderson

Photo by Ed Williams / Monterey County

Around the World in One Bowl

Salad, ensalada, salade, салат, insalatta, šalát, salāti, salotos. However you slice it, the unique flavors, combinations and ingredients in a salad symbolize the richness and individuality of every culture—a richness that, in California, expresses the state’s diversity and abundance. With three-quarters of the nation’s most popular leafy greens grown in the Golden State, people of various backgrounds can celebrate the unique salads of their homeland here in California.

But who is ensuring the salad’s key ingredients meet the highest standards of food safety? Who is making certain that this cornerstone of cultural expression—the leafy green—is safer for all those who eat it in their Asian wraps, tacos, pitas and hamburgers?

Everyone in the production line, from California growers to national retailers, has joined to raise the bar on food safety practices for an industry that is purveyor to the nation’s salad bowl. And they have done so through an unprecedented and overwhelmingly supported public-private partnership—The Leafy Green Products Handler Marketing Agreement (LGMA).

The LGMA:

A Cornerstone for Food Safety

Although food safety had always been a high priority for the leafy greens industry, the *E. coli* outbreak in 2006 made it center stage. The industry immediately called upon university researchers, scientists, food safety experts, processors, shippers and regulators to boost food safety integrity by developing a rigorous and comprehensive set of science-based standards to minimize the risk of pathogenic contamination.

“We have learned that if you do have a problem, you have to be in a position to deal with it quickly, to analyze risks and put appropriate practices in place,” said Scott Horsfall, chief executive officer of the





Discussing the LGMA program are (left to right): Joe Pezzini, Vice President of Operations, Ocean Mist Farms; Scott Horsfall, CEO, California Leafy Green Products Handler Marketing Agreement; and Kay Filice, Filice Farms.

“I very much believe in the program. It’s the same food I feed my family as I bring spinach home from my field. It’s my livelihood, my reputation and the safety of my kids.”

**—Joe Pezzini,
LGMA Chairman**



LGMA. “When somebody is implicated in something like this, it affects the entire industry.”

Operating with oversight from the California Department of Food and Agriculture (CDFA), creators of the LGMA initiated a mechanism for verifying through mandatory government audits that leafy green handlers adhere to a standard set of specific, measurable and scientifically based food safety practices. To date, nearly 1,000 farm audits have been conducted for

growers of arugula, butter lettuce, chard, escarole, iceberg lettuce, spinach, red leaf lettuce, baby leaf lettuce, cabbage, endive, green leaf lettuce, kale, romaine lettuce and spring mix.

“As producers, we have to do everything possible to minimize the risk of contamination,” said Joe Pezzini, chair of the LGMA board and vice president of operations for Ocean Mist Farms.

The Auditing Program: A Cornerstone of Integrity

Rick Jensen, chief of CDFA’s Inspection and Compliance Branch explained that leafy green growers do not hire the auditors, which ensures the integrity of the auditing program. “We are an unbiased, independent, third party enforcing very specific standards with inspectors who have gone through a rigorous USDA training program,” Jensen said.

LGMA has received overwhelming support from the industry. Nearly 120 handlers¹ representing

¹ “Handler” means any person who handles, processes, ships or distributes leafy green product for market whether as owner, agent, employee, broker or otherwise. This definition does not include a retailer.

approximately 99 percent of the volume of California leafy greens have joined the agreement, committing themselves to adhere to the “good agricultural practices” accepted by the LGMA board. The program is voluntary, but once a handler joins, all provisions are mandatory.

“The broad support from the industry is incredible,” said Nate Dechoretz, director of CDFAs Inspection Services Division. “I’ve never seen this level of support for a voluntary program.”

The LGMA has gained attention worldwide. After a thorough review of the LGMA audit program and standards, both Canada and Mexico have declared they will accept California leafy green products only from companies certified by the program. Arizona and Florida have also adopted the LGMA model, and widespread support exists for a national effort patterned after the LGMA structure.

According to Pezzini, the support from abroad convinced domestic retailers of the program’s value, and it helped them to get behind it. Now many domestic retailers will only accept California leafy greens from growers adhering to the LGMA practices.

The Investment: A Cornerstone of Success

According to the LGMA annual report, the projected food safety annual investment for all LGMA members is \$71 million—up 201 percent from the amount spent prior to September 2006. In addition, internal LGMA studies indicate that the industry doubled the number of staff members dedicated to food safety since 2006.

“A commitment from industry and the valuable partnership with the government led to the success



“We are an unbiased, independent, third party enforcing very specific standards with inspectors who have gone through a rigorous USDA training program.”

**—Rick Jensen,
Chief, CDFA’s Inspection and
Compliance Branch**



of the LGMA,” said Pezzini. “The handlers have really stepped forward 110 percent and committed themselves. Partner that with the commitment from CDEA and USDA and you see what really led to the success of the program.”

“We’ve said all along that the standards are based on the best science and research available now, but they can also be changed and modified as better science and research comes along,” said Pezzini. “That’s the beauty of it; that it can respond to new situations. We’re hopeful that research will bring even better practices over time.”

The Results: A Cornerstone of Progress

In February 2008, the LGMA commissioned a nationwide research project to learn more about consumer attitudes toward the program. The research project surveyed 800 adults who were the primary shoppers in their homes. After the LGMA model was explained to the sample group, 89 percent of respondents expressed a favorable opinion of the LGMA approach to food safety. In addition, the explanations raised consumer confidence from a baseline level of 47 percent to 70 percent.

These are optimistic results, but the LGMA seeks more than positive public perception. The LGMA strives to ensure that staple salad ingredients meet the highest standards of safety for the millions of people who rely on the California farmer for their leafy greens and, consequently, their health and their expression of cultural diversity.

“I very much believe in the program,” said Pezzini. “It’s the same food I feed my family as I bring spinach home from my field. It’s my livelihood, my reputation and the safety of my kids.”



What Is the Future of Food Safety? In a Word, *Research*.

Farmers, Consumers look to UC Davis-based Center for Produce Safety

By Jay Van Rein

Since the first cultivated crops inched skyward, farmers have looked for ways to improve the safety of the food they grow. Researchers, too, have been at this for years, and have contributed a steady stream of advancements ranging from the mundane to the magical—from protective fencing to weed-zapping robots. Indeed, the future of food safety is taking shape today in the fields and labs, barns and boardrooms of California agriculture.

Several groups have stepped up to the forefront to increase food safety research. The first was Fresh Express, a major processor and handler of leafy greens, which funded \$2 million in research with scientists from around the country. The results, including several important new findings, were announced during an open industry forum in September 2008. The California Leafy Greens Research Board is also funding ongoing research into several aspects of food safety.

Despite all the elbow grease and technological advancements generated over the years, it became clear that industry as a whole needed a single organization dedicated solely to food safety research with the capacity to not only spearhead new research but also act as a clearinghouse for the findings and new practices.

California's agricultural community has recognized this urgent need for an organizing force for food safety, and its answer is the newly created Center for Produce Safety at U.C. Davis. Since its formation in 2007, the center has awarded more than \$500,000 in research grants. A new program called "Partners in Research" was unveiled in late 2008 and aims to attract and unite organizations with research needs and funding so that projects can be mounted more rapidly and enhanced with matching funds.

Taylor Farms and the Produce Marketing Association each provided a \$2 million infusion that enabled the initial wave of work by the Center for Produce Safety, and other agricultural organizations have lined up to add their support in the form of both funding and leadership. The advisory board for the center is a high-powered team that any agricultural organization would trust with its food safety decisions.

"This board operates at a very high level, with farmers and researchers and academics all involved in deciding what the most urgent research needs are," says Executive Director Bonnie Fernandez-Fenaroli. "They are sticking to the most usable

science—the projects that are most likely to lead to tangible, field-ready improvements in food safety.”

If you're a tomato grower who watched the bottom fall out of the market last year due to misdirected concerns about foodborne disease, you want to know that researchers are going to be able to make it easier and faster for regulators to confidently identify the source of a crop-related pathogen or



Food Safety Research in Progress

Projects Awarded Fall 2008 by the Center for Produce Safety

A sensitive and specific molecular testing method for live salmonella in produce

Principal Investigator: Beilei Ge
Louisiana State University

Enhancing the effectiveness of human pathogen testing systems for the advancement of practical produce safety research and commercial management

Principal Investigator: Carol D'lima
University of California, Davis

Environmental effects on the growth or survival of stress-adapted Escherichia coli O15:H7 and Salmonella spp. in compost

Principal Investigator: Xiuping Jiang
Clemson University

Examination of the survival and internalization of E.coli on spinach under field production environments

Principal Investigator: Steven T. Koike
University of California Cooperative Extension

contaminant. A compost study already funded by the Center for Produce Safety is aiming at these key questions: “Where did the pathogen come from? How did it get on the produce? How can we get rid of it?”

A leafy greens farmer who has spent the past few years aligning his farming practices with new good agricultural practices ushered in by the *E. coli* outbreak of a few years ago may also place a high priority on preventive measures. A project awarded by the Center for Produce Safety in fall 2008 will determine how *E. coli* survives the specific environmental pressures of an agricultural field, and that could lead to improved practices on the farm to further reduce risks.

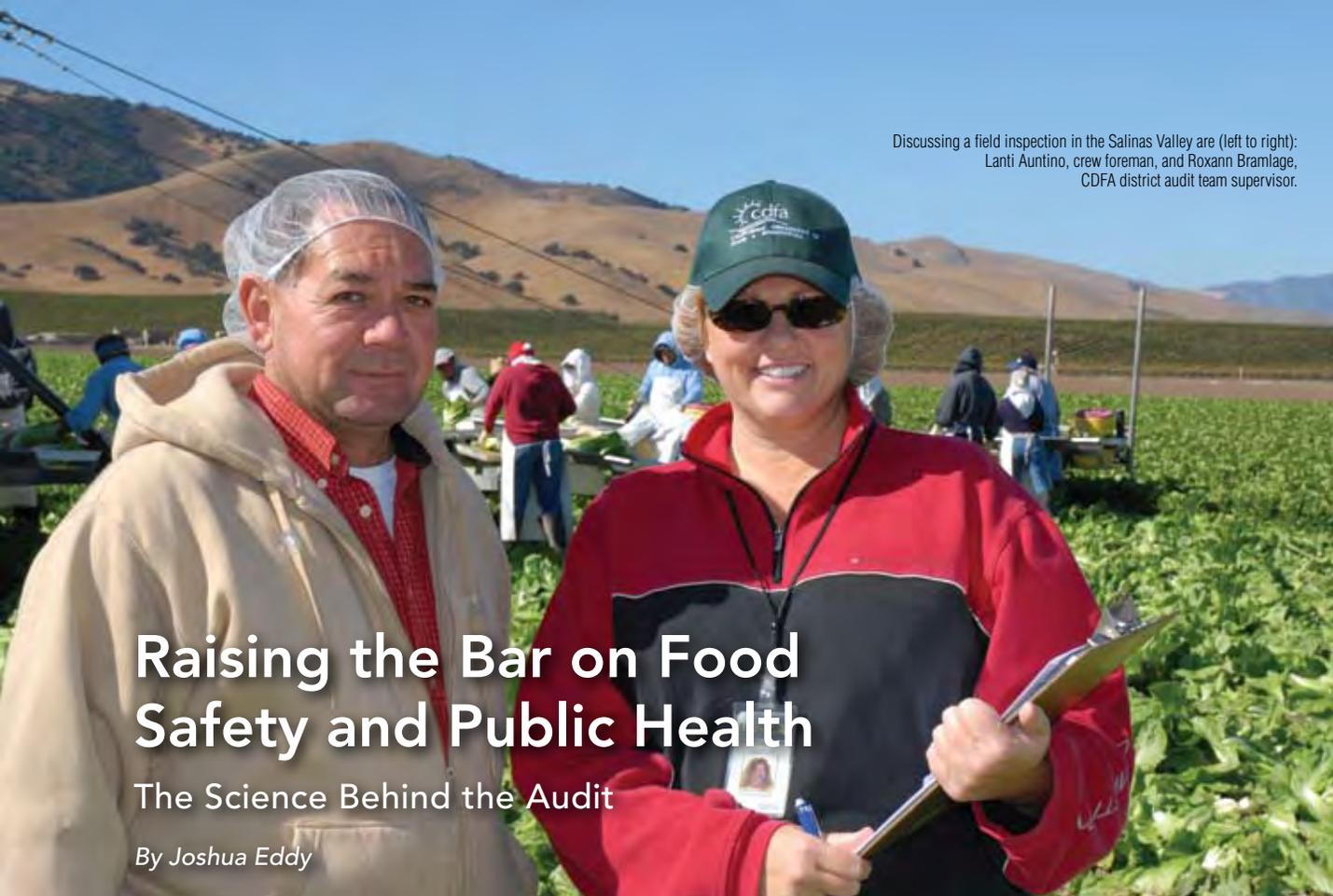
The questions posed to these researchers are sometimes so direct as to be deceptively simple, but—of course—the answers are complex and depend on a dizzying array of environmental and other variables. Finding the answers takes science, and good science takes time—but the wheels are already turning, thanks to this new center.

Each commodity group and each region will always have its own specific needs, but regardless of the crop or location, the urgency of food safety in California has never been higher. Farmers, processors and others who handle or transport crops want to know the answers to basic questions that will protect them and their consumers, and the Center for Produce Safety gives them a clearer route to the answers by streamlining the research and providing a clearinghouse for the results.

“For a lot of industries, competition is king,” Fernandez-Fenaroli observes. “On this issue, though, I think we’re seeing more sharing of information and a general show of cooperation and support across the range of companies and crops. That bodes well for the future of food safety.”

Farmers have always seen food safety as a simple matter of protecting their valued consumers, whether those consumers are members of their community or members of their own families. Now that the cause of food safety has a unifying force in the Center for Produce Safety, the future of food safety isn't just promising—it's delivering.

Discussing a field inspection in the Salinas Valley are (left to right): Lanti Auntino, crew foreman, and Roxann Bramlage, CDFA district audit team supervisor.



Raising the Bar on Food Safety and Public Health

The Science Behind the Audit

By Joshua Eddy

Photo by Joshua Eddy

California is committed to producing the safest and highest quality agricultural products in the world. From the fertile fields of Salinas to the arid climate of the Imperial Valley, agricultural best practices characterize California's food system. However, the *E. coli* outbreak in the summer of 2006 had a profound effect on the leafy green industry and all food producers.

Responding to this outbreak, California's handlers organized to raise the bar on food safety by creating stringent metrics—quantifiable measurements used to gauge production practices for leafy green products. From soil amendments to water quality and field activities; every aspect of growing food for the table is measured. This measurement includes a 15-page, 184-checkpoint audit where the handler must answer, provide documentation and demonstrate corrective action if a violation occurs.

Sample audit questions include:

- Are grazing lands/domestic animals within 30 feet from the edge of the crop?
 - Was the non-synthetic crop treatment produced using a validated process for pathogen control?
- In addition, the audit includes a field inspection that allows auditors to gauge effectively the performance of the grower in meeting the metrics of the California Leafy Green Products Handler Marketing Agreement (LGMA). While paper audits document the tests, sources and practices that are taking place, the field visit provides a “feet on the ground” assessment of the grower's good agricultural practices.
- Without successfully completing this audit, the handler could possibly lose LGMA certification and lose his customers. Supermarkets and restaurants might not purchase from a handler who has lost this certification.
- Was the water test conducted for each water source within 60 days of the first use on post-germinated fields?

What Is an Audit?

The audit starts with a visit to the handler's office; a handler can represent several growers. After the handler is informed of the grower and block to be audited, the review of documentation begins. The 15-page questionnaire involves binders of documentation. Water tests on every use of water—from field irrigation, water mixed for applications, and water used to clean equipment, are just a few of the examples. For each stage of production, including the pre-planting and pre-harvest stage, samplings must have occurred in different time periods for each test.

In addition to water-use tests, documentation must also be shown for soil amendments, environmental factors, worker practices and field sanitation. The paper audit, performed by California Department of Food and Agriculture inspectors, ensures that some of the highest standards in the world for field food safety are met. All of these metrics, and some that exceed U.S. food standards, are documented and enforced upon the 115 handlers who represent approximately 99 percent of the leafy green volume in California. Best practices define this industry and the LGMA is proof of growers' and handlers' dedication to food safety and public health.

Following the extensive review of documentation, the second phase of the audit—the field visit evaluation—begins. Department field auditors will travel with the handler and grower to the pre-determined block for inspection. The field observation evaluates the documented practices.

Investigators will ask such questions as:

- Are there water sources not identified in the paper audit?
- Is there any evidence of undocumented soil amendments?
- Is there any evidence of the use of non-sanitized farm equipment that may have come in contact with raw manure, untreated compost, waters of unknown quality, wildlife or domestic animals?

Each auditor is knowledgeable of field production, trained to identify violations and aware of the variety of mitigating factors involved in open field production. During the inspection, water tests are conducted in the field on the harvest tool dip bucket and other field sanitation equipment.

The audit is complete following the field inspection and a closing interview that documents any findings. Both the grower and handler have an opportunity to exchange views with the department's inspector on any potential findings.

"The audit process has been embraced by the industry because farm workers have been trained and are knowledgeable concerning the required food sanitation practices in the field," said Steve Thomas, the department's audit team program supervisor.

By coming together and creating a system of metrics, enforced by the California Department of Food and Agriculture and the U.S. Department of Agriculture, the industry has taken bold steps and raised the bar to protect public health and improve food safety. From the produce in the field to the salad on the plate—California's growers, handlers and farm workers are dedicated to providing the safest and highest quality food in the world. The audit, the metrics behind it and the precedent it has created worldwide are a strong testament to that fact.

Who could forget Popeye's signature lyric, "I'm strong to the finish, 'cause I eats me spinach?" As consumers reach for their leafy greens, they may be unaware of the collaboration by the entire industry to ensure that our food is safe. So, the next time you walk through the produce aisle, perhaps while humming that memorable Popeye tune, be assured that the leafy greens industry is working diligently to make the United States' food supply even safer.

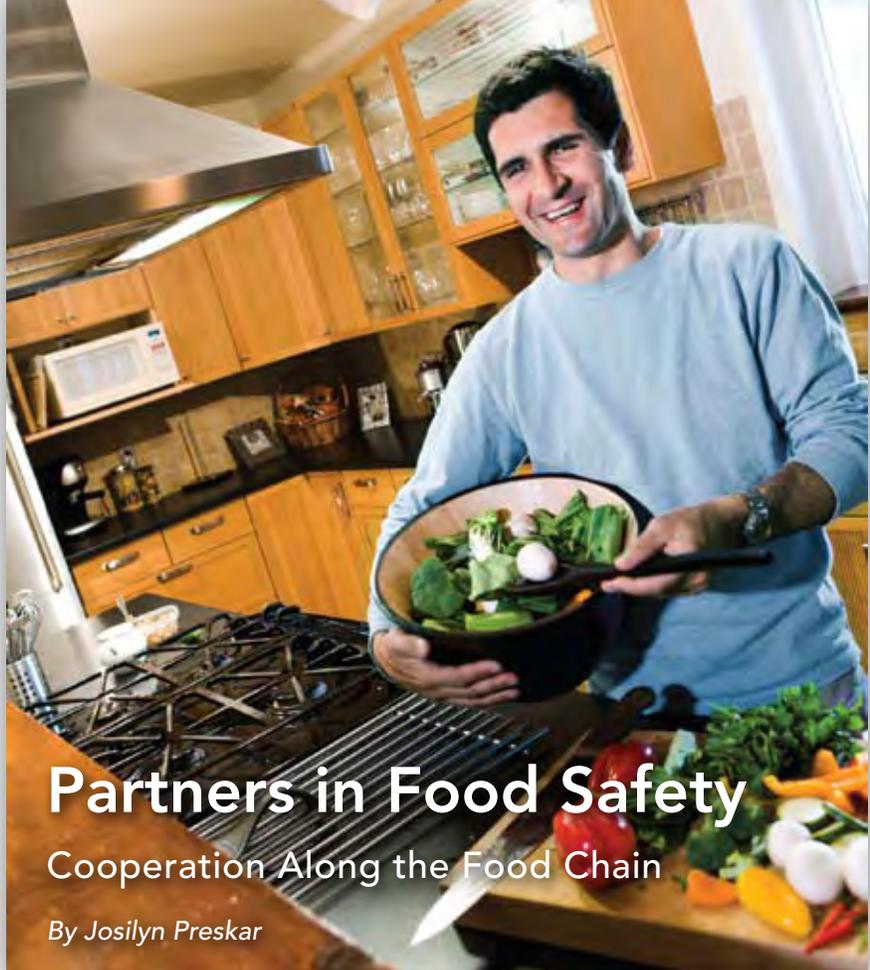
The efforts of growers and handlers to set high standards for protecting public health and preserving consumer confidence have never been stronger.

As handlers and growers moved to create a renewed sense of security in the food supply, they came together to form the California Leafy Green Products Handler Marketing Agreement (LGMA). This new program impacts the entire industry—from growers and handlers to retail buyers and even field auditors.

A Grower's Perspective

Leafy greens grower, Kay Filice, owner of Filice Farms, is committed to complying with the food safety practices accepted by the LGMA board. Her purpose is to prevent all risks of contamination. As a grower, this obligation requires extensive training programs for her employees and supervisors. Employees must follow good agricultural practices involving hygiene and food safety. Supervisors must conduct risk assessments of every field before planting. All of this must be fully documented.

"There are so many impacts on the industry," said Filice. "I think there is a tremendous, renewed commitment to food safety practices and a resolve to find scientific answers to improve—even more—the metrics or best practices."



Partners in Food Safety

Cooperation Along the Food Chain

By Josilyn Preskar

This program has been successful because growers and handlers are working in close collaboration. This improved communication has extended to retailers and food service personnel. The increased communication is "to help them better understand exactly what the LGMA standards are and what they mean," Filice said.

"This is a shared responsibility that has to be maintained throughout the cold chain, but it also goes to the produce in the retailers' back rooms and right through to the consumer's kitchen table. It is only then that the whole food safety cycle will really be complete," she said. As an example of shared responsibility, she cites a question that comes up often: Do small and large farmers face the same types of problems? She stresses that food safety is everyone's concern regardless of the number of acres that a person farms.

Everyone from the grower to the consumer benefits from this program. "I think anytime you can say that the industry is producing a safe, nutritious product that consumers can buy with

confidence, then we are all benefiting,” said Filice. “One of the great benefits not only to the industry but to the consumer is that we are extending these food safety practices to all of our crops, not just leafy greens. These practices are now in place with all of our employees and there’s a heightened level of awareness and commitment to good farming practices that flows over to all our crops.”

Filice would like to see the success of this program as a model to set the stage for other states to become part of a national program. “Ideally, all producers of leafy greens would be operating under the same set of practices and all consumers would then be protected,” she proposed.

An Auditor’s Perspective

As an LGMA auditor with the California Department of Food and Agriculture, Debra Anderson immediately saw the value of the program. “It’s going to make a major difference,” said Anderson. “This program is making the growers and handlers more aware of how to put out a good product without putting the consumer at risk.”

Auditors play a key role in ensuring members’ compliance with accepted food safety practices. The audit covers many aspects of a handler’s operation, including environmental assessments, water use, worker practices and field sanitation. “The process has worked really well from day one to now, and the improvements I have seen are just amazing,” Anderson emphasized. She credits her team’s extra efforts for the program’s relatively smooth start.

Anderson says that this is a coordinated effort where everyone is working together to “make it better, make it safer.” From growers to handlers, harvesters, auditors, and to state and federal employees, “everyone wants to see this program work,” she said.

Anderson, who would also like to see other commodities follow this program, said LGMA is “absolutely” setting a precedent, as auditors have already received inquiries from other states.

A Buyer’s Perspective

Tim York, a buyer with Markon Cooperative and chairman of the board for the U.C. Davis Center for Produce Safety, considers the whole LGMA organization as an impressive achievement.

“When you look at where we were in the wake of the spinach crisis, California growers and handlers were saying, ‘What can and should we do?’” York recalled. “They did exactly what they should have done, and that was to put together a common standard for leafy greens food safety. We did not have this in any commodity, any product, anywhere until that point. The fact that it began shortly after the spinach crisis and was in place by spring of 2007 is remarkable in itself.”

The cooperation among producers and handlers working to develop this standard was unprecedented. Suppliers were coming together and sharing what they knew about food safety for the common good of the industry, and regulators and the scientific community were likewise cooperating to lend their insights in developing these practices.

“As buyers, we wanted specific, measurable and verifiable standards around food safety and that is exactly what the LGMA developed,” said York. He practices what he preaches by requiring that anyone his company does business with must be a member of the LGMA. “From our standpoint, the LGMA standards set a new industry benchmark. I think buyers have a lot more confidence in our own safety standards now—a standard that’s been developed by the best minds in industry, the research community and government.”

“I think LGMA set the standard by which all others should be measured.” Added York, “When you have something very specific to measure against and you can see what people are doing—they’re in or they’re out—there is no subjectivity to it, and that’s what we really look for.”

Consumers reaching for spinach, arugula, romaine, or green leaf lettuce can buy with confidence. With advances in science coupled with programs such as the LGMA, California will remain a leader in protecting our food supply.