



FOOD SAFETY OUTREACH PROGRAM NATIONAL PROJECT DIRECTORS MEETING

AUGUST 18-19, 2020

1-5PM ET

NECAFS



The Northeast Center to
Advance Food Safety

SC



Southern Center

for Food Safety Training, Outreach and Technical Assistance



North Central Region

Center for FSMA Training, Extension
and Technical Assistance

WRC



Western Regional Center to
Enhance Food Safety

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USDA NIFA
Food Safety Outreach Program
National Project Directors Meeting

August 18-19, 2020
Videoconference

Welcome to the virtual USDA NIFA National Food Safety Outreach Program National Project Directors Meeting. Over the next two days, the Lead Regional Coordination Center (LRCC) and four regional centers Southern (SC), North Central (NC), Northeast (NECAFS), and the Western (WC) will host FSOP grant awardees from around the country as they discuss their accomplishments and success stories. Additionally, each of the four regional centers will provide an update on regional activities and projects. Finally, there will be an overview and update on the FSOP program from the USDA NIFA representative. We hope that you will take some time to review this book of abstracts, in addition to joining the virtual meeting. On Tuesday we'll hear from awardees from the Northeast and Southern regional centers, and on Wednesday we'll get updates from the North Central and Western regional centers. Despite not being able to meet in person, we hope that you will benefit from this meeting and enjoy hearing about all of the amazing work being performed around the country by so many dedicated food safety educators. Thank you for joining us!

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Planning Committee

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Oregon State University
Stephanie Brown, WRCEFS Coordinator
Oregon State University

Food Safety Outreach Program National Project Directors Meeting
 August 18-19, 2020
 1-5 PM EDT, 9 AM-1 PM PST each day
 August 18, 2020-Day 1 Agenda

Time (ET)	Title	Presenter	Institution
1:00 PM	Welcome and Overview of Meeting	Keith Schneider	University of Florida Southern Center and Lead Regional Coordination Project Director
1:15 PM	USDA-NIFA Update	Courtenay Simmons	USDA-NIFA
Northeast Center to Advance Food Safety <i>Session Moderator: Elizabeth Newbold, University of Vermont/NECAFS</i>			
1:30 PM	Regional Center Update-NECAFS	Elizabeth Newbold and Chris Callahan	University of Vermont
1:45 PM	Expanding the reach of New Hampshire's Food Safety Education and FSMA Programs to Include Value Added Processors	Ann Hamilton	UNH Cooperative Extension
2:00 PM	Produce Safety Spring Training: Engaging Beginning Farmers With Timely and Practical Guidance to Build a Community of Food Safety Practitioners	Maggie Kaiser	National Young Farmers Coalition
2:15 PM	A National Dairy Food Safety Plan Coaching Workshop	Sam Alcaine	Cornell University
2:30 PM	<i>Break and mic check</i>		
2:45 PM	Food Safety for Qualified Exempt Food Producers to Build Economic Viability Under the Food Safety Modernization Act	Cynthia James	Cornell University
2:55 PM	Infotoons and Videos as Delivery Tools for Food Safety Training	Rob Machado	University of Maine Cooperative Extension
3:05 PM	Fruits, Vegetables, and FSMA Compliance: Multilingual Audiovisual Food Safety Training for Farms and Packinghouses	Elizabeth Bihn	Cornell University
Southern Center for FSMA Training <i>Session Moderator: Michelle Danyluk, University of Florida/SC/LRCC</i>			
3:15 PM	Regional Center Update-SC	Michelle Danyluk	University of Florida
3:30 PM	Bridging the Gaps: Approaches for Treating Preharvest Agricultural Water On-Farm	Faith Critzer	Washington State University
3:45 PM	<i>Break and mic check</i>		
4:00 PM	Environmental Assessments to Customize Food Safety Training for Very Small to Small Producers in the Southeastern United States	Kristen Gibson	University of Arkansas System Division of Agriculture
4:15 PM	FSMA Education and GAP Training Targeting Small and Limited Resource Specialty Crop Growers	Armitra Jackson-Davis	Alabama A&M University
4:30 PM	Experiential Learning Opportunities for Limited Resource Growers through Mobile Farm Innovation In Mississippi, Alabama, and Georgia	Kristin Woods	Auburn University
4:40 PM	Food Safety Outreach, Applied Research, and Technical Assistance by the Public Health Microbiology Laboratory in Nashville	Aliyar Fouladkhah	Tennessee State University
4:50 PM	Produce Food Safety Training for Military Veterans	Rebecca Brightwell	University of Georgia
5:00 PM	Day 1 - Adjourn		

August 19, 2020-Day 2 Agenda

Time (ET)	Title	Presenter	
1:00 PM	Day 2 Welcome	Keith Schneider	University of Florida
North Central Region			
<i>Session Moderator: Anirudh Naig, Iowa State University/NCR</i>			
1:05 PM	Regional Center Update-NCR	Joe Hannan	Iowa State University, NCR
1:20 PM	Safety Education Program for Veteran Farmers	Yaohua Feng	Purdue University
1:35 PM	Development of a Community Culinary Incubator to improve Food Safety and Value-Added Opportunities for Small Farmers, Producers, Processors and Potential Entrepreneurs (FPPE)	Cindy Borgwordt	Lincoln University
1:50 PM	Expanding FSMA Produce Safety Rule Outreach to Underserved Diversified Fruit and Vegetable Farms in Minnesota	Annalisa Hultberg	University of Minnesota
2:00 PM	Food Safety Education and Outreach Programming for Plain Growers (Amish and Mennonite)	Sanja Ilic	The Ohio State University
2:10 PM	Community Based Technical Assistance and Training Reaching New Audiences to Help Small Processors Reach FSMA Compliance	Majed El-Dweik	Lincoln University
2:20 PM	<i>Break and mic check</i>		
Western Regional Center to Enhance Food Safety			
<i>Session Moderator: Jovana Kovacevic, Oregon State University/WRCEFS</i>			
2:35 PM	Regional Center Update-WRCEFS	Jovana Kovacevic	Oregon State University, WRCEFS
2:50 PM	Latino Immigrant Farmers Trained in Organic Farm Food Safety (LIFT OFFS)	Nathan Harkleroad and Antonio Acosta	Agriculture and Land-Based Training Association
3:05 PM	Supporting FSMA Compliance for California's Regional Food Hubs through Training and Technical Assistance	Erin DiCaprio	UC Davis
3:20 PM	Hands-On Food Safety Outreach and Education to Socially Disadvantaged Farmers in Santa Clara, San Benito, and Santa Cruz Counties	Aparna Gazula	UC Cooperative Extension
3:35 PM	<i>Break and mic check</i>		
3:50 PM	Supporting Underserved CA Leafy-Green Producers' FSMA Compliance, through Interdisciplinary Food Safety, Communication and Marketing Training	Jeta Polloshka	California Polytechnic State University
4:00 PM	Extending Food Safety, Sanitation and Quality Training to Primary Processor Employees that have Frontline Interactions with Seafood Harvesters	Christina DeWitt	Oregon State University
4:10 PM	Hawaii Roots Food Safety Community Outreach Project: A Look at Food Safety Through a Cultural Lens	Sharon Kaiulani Odom	Kokua Kalihi Valley
4:20 PM	Closing Remarks	Keith Schneider	University of Florida
4:30 PM	Day 2 - Adjourn		

Abstracts

Listed alphabetically by reported Project Director's Last Name.

Title: **Develop and Deliver Hands-On Training to Evaluate and Reduce Microbial Food Safety Risk Associated with Agriculture Water**

Author(s): **Achyut Adhikari**, Louisiana State University AgCenter
Kathryn Fontenot, Louisiana State University AgCenter
Melissa Cater, Louisiana State University AgCenter
Fatemeh Malekian, Southern University

The Food Safety Modernization Act (FSMA) Produce Safety Rule (PSR) requires that all agricultural water must be safe and of adequate sanitary quality for its intended use. Several methods are currently available for water treatment, such as chlorination, chlorine dioxide, ozone, filtration, and UV treatments. However, not all the methods are suitable for on-farm surface water treatment due to their complexity and variability in effectiveness. Fruit and vegetable producers using surface water to irrigate crops are required to have appropriate water treatments in place that do not leave any chemical residue. The overall goal of this project is to reduce the food safety risk associated with the surface water source in Louisiana. A mobile water treatment unit is developed to demonstrate the proper treatment of irrigation water using UV-C light and chemical sanitizers (chlorine and Peroxyacetic acid). A curriculum on agricultural water sampling and treatment and several educational materials were developed to educate the growers on how to collect water samples and treat irrigation water properly. A field day with participation from 73 farmers and extension agents was organized at the Louisiana State University Research Farm. The field day was focused on produce safety, agricultural water treatments, and on-farm food safety risk assessment. Louisiana farmers, regulators, extension agents, and students received hands-on experience in agricultural water sampling and treatment techniques. Additional workshops on water sampling and treatment using the mobile unit will be offered after the COVID-19 pandemic is over.

Title: **National Dairy Food Safety Coaching Workshop**

Author(s): **Samuel Alcaine**, Cornell University
Dennis D'Amico, University of Connecticut
Clint Stevenson, North Carolina State University
Tim Stubbs, Innovation Center for US Dairy

Consumer interest in artisanal dairy foods continues to grow across the United States. While food safety education programs, like the FSPCA Preventive Controls for Human Foods course, provide familiarity with the new regulations and the basic food safety plan concepts, many small food producers find it challenging to develop and implement food safety plans compliant with the Food Safety Modernization Act (FSMA). Our goals are to: i) execute a national series of yearly workshops that link artisan dairy food producers to academic and industry experts with the knowledge and experience to coach these producers through the development of their business-specific food safety plans, ii) evaluate the impact of training on participant knowledge, behavior change, and food safety plan implementation; and iii) identify challenges to and opportunities for food safety plan implementation among dairy food producers. Building upon the FSPCA curriculum, we modified lectures, templates, and program flow to focus on dairy-relevant examples and provide participants the framework to work on their facility-specific food safety plans. We also successfully developed a national network of University extension-associated coaches with experience in coaching small dairy producers through food safety plan development. These regional networks link artisan dairy producers not only with local coaches, but with peers that they can utilize as resources and support to continue work on food safety. To date we have reached 214 artisan dairy producers through 14 workshops, in 12 states, by working with 23 food safety coaches. We have worked with 9 Universities, 5 regional dairy organizations, and two national dairy organizations. COVID-19 has altered the in-person nature of these workshops, and we are modifying the program to enable personalized, engaging coaching via online tools to continue the reach and use of these workshops to aid artisan dairy producers with their food safety plan development.

Title: **Achieving FSMA Compliance through USDA Harmonized GAP Certification -Preparing the Four Corners Region’s Diverse Farming Population for Successful Third Party Food Safety Certification**

Author(s): **Benjamin Bartley**, La Montañita Food Cooperative
Valerie Smith, La Montañita Food Cooperative
Steven Warshawer, La Montañita Food Cooperative

Since 1976, La Montañita Cooperative (LMC) has been working in New Mexico and the Four Corners Region (New Mexico, Arizona, Utah, and Colorado) to improve market access and business viability for small to mid-sized farms. In recent years, LMC has observed firsthand that achievement of USDA Harmonized Good Agricultural Practices (GAP) certification is a major barrier for growers who are trying to access wholesale markets.

At the same time, understanding and complying with the federal food safety regulations mandated by the Food Safety Modernization Act (FSMA) creates another formidable challenge for growers, especially small-scale and limited-resource producers. These two challenges share a common solution, however, in that growers can achieve FSMA compliance and greater market access through Harmonized GAP certification.

To create long-term capacity for FSMA-readiness and Harmonized GAP certification, LMC’s FSOP project will:

1. Adapt existing FSMA and farm food safety outreach, education, and training resources to increase cultural relevance, applicability, and accessibility for native Spanish speaking growers;
2. Deliver this training through various formats, from traditional classroom-based learning to experiential on-farm instruction and demonstration; and
3. Conduct grower and buyer outreach around the Harmonized GAP certification program, LMC’s Four Corners Region GroupGAP Network, and the alignment of the Harmonized GAP standard with FSMA.

LMC’s approach includes three “tiers” of food safety trainings. These workshops educate producers on the principles of on-farm food safety (including the identification of hazards and risks; how to assess those risks as they relate to the growers’ operation; and how to keep good farm records to support a functioning traceability system).

The significance of this project is that it will create a self-sustaining cohort of service providers and increased grower participation in the Four Corners Region GroupGAP Network, providing for a replicable model of food safety technical assistance provision and market access.

Title: **Fruits, Vegetables, and FSMA Compliance: Multilingual Audiovisual Food Safety Training for Farms and Packinghouses**

Author(s): **Elizabeth Bihn**, Cornell University
Trevor Suslow, Produce Marketing Association
Travis Chapin, University of Florida

The Food Safety Modernization Act (FSMA) Produce Safety Rule (PSR) establishes science-based minimum standards for safe growing, harvesting, packing, and holding of produce on farms. New standards were introduced for worker training, and health and hygiene. These establish qualification and training requirements for all personnel who handle covered produce or food-contact surfaces and their supervisors, require documentation of required training, and establish hygienic practices and other measures needed to prevent persons from contaminating produce with microorganisms of public health significance. Produce growers and packinghouse owners subject to the rule will need to comply with the FSMA PSR and meet worker training requirements. A collection of three videos are being developed to support effective training of employees including those working in fields and packinghouses as well as those who manage employees. These videos will be translated into multiple languages (English, Spanish, Hmong, Haitian Creole) to facilitate wide adoption across the produce industry. Video was collected in three different states on a variety of different farms to build a series of videos that reflect real production and packing environments. Completion of this project will result in the development of effective multilingual educational video materials that increase farm worker understanding and implementation of proper hygiene practices will reduce food safety risks for the fruits and vegetables they harvest and pack.

Title: Development of a community Culinary Incubator to Improve Food Safety and Value-added Opportunities for Small Farmers, Producers, Processors and Potential Entrepreneurs (FPPE)

Author(s): Cindy Borgwordt, Lincoln University

Targeting small limited resource farmers, producers, processors and small entrepreneurs (FPPE) develops and implements a Culinary Incubator (CI) providing food safety, regulatory and business support needed to success. Adding processing equipment to the Lincoln University (LU) commercial kitchen, at low cost investment, expands its functionality for processing and value-added product. New audiences include community members, small processors and entrepreneurs. The LU Small Business Development Center (SBDC) will provide business training and ongoing consulting; nurturing from idea to market. Local regulators will participate in training and guidance. Efforts will be customized for the local community and audience based on needs assessments.

The long-term goal is to increase food safety compliance in product development and food safety awareness in the community providing knowledge of FSMA and food safety practices support and training. A needs assessment will direct program development to meet the specific needs of the local community and audiences. In the end, more safe local foods will be available, the community will be more food safety aware and FPPE will have agriculture opportunities not otherwise available. A community networking effort leads to ongoing support for the targeted audience.

This project coordinates efforts between 2 land grant institutions; Lincoln University, an 1890 and Iowa State University, an 1862. Outcomes include improved food safety and FSMA compliance with community engagement and more local agricultural streaming to the community. This project builds upon previous and existing NIFA funded efforts. Due to delayed funding and COVID 19 the project will begin August 2020.

Title: **Training Military Veterans on Produce Food Safety**

Author(s): **Rebecca Brightwell**, The University of Georgia
 Kyle Haney, The University of Georgia

Military veterans have been increasingly entering into agricultural careers, which most being younger (under 40 years old) and having served in combat during their service. Understanding food safety is a critical component to understand when operating a farm. Many veterans also have a disability diagnosis as a direct result of their service. Due to the prevalence of service-related injuries and mental health impairments, the curriculum for this project was designed using the Universal for Design (UDL) framework. The project offered in-person workshops in Georgia and Texas. In the current grant year, the curriculum is being adapted to an online interactive format which be available for free to any military veteran.

To date, 53 veterans attended 5-hour long workshops. Of the participants 76% reported having disabilities and mental health issues, with most reporting multiple conditions (54% PTSD, 51% anxiety, 35% depression, 54% physical, 49% tinnitus and 41% hearing loss). They rated the following belief statements after the workshop [I believe...]: as a grower I have an important role in protecting people who consume the food I grow from getting sick (89% strongly agreed, 11% agreed); that how land is used to grow produce can affect the safety of the product (77% strongly agreed, 23% agreed); that is important to regularly test the water used on crops to ensure safety of the crop (76% strongly agreed, 22% agreed, 2% disagree); that it is important to wait 90-120 days before using raw manure on a crop (68% strongly agreed, 22% agreed, 6% undecided, 2% disagree, 2% strongly disagree); that farm worker hygiene and practices can impact the safety of the crop (86% strongly agreed, 14% agreed); that animals can impact produce food safety (82% strongly agreed, 18% agreed); that using best practices during harvest and storage of produce to prevent contamination of the produce and growth of harmful bacteria (79% strongly agreed, 21% agreed); that how I display and store my product if selling at a farmers market can impact food safety (75% strongly agreed, 21% agreed and 4% undecided); and that the Food Modernization Safety Act is important and can improve food safety (67% strongly agreed, 23% agreed, 8% undecided, 2% disagree). Specific UDL framework design elements were also measured and showed to be successful in aiding the veterans in their learning.

Title: **Cultivate Kentucky Partnership Expansion**

Author(s): Lilian Brislen, University of Kentucky
Paul Priyesh Vijayakumar, University of Kentucky
Bryan Brady, University of Kentucky
Badrinath Vengarai Jagannathan, University of Kentucky

The Cultivate Kentucky Partnership's approach to on-farm food safety service provision relies on close collaboration between University staff and faculty, Cooperative Extension agents and specialists, state agencies, community-based organizations and producer organizations. The program emphasizes scale-appropriate, culturally appropriate and market-oriented approaches to on-farm food safety planning and implementation. This project expanded existing partnership work by supporting the development of in-person and on-demand trainings as well as multi-media educational materials that address knowledge gaps for crop specific, pre- and post-harvest water testing and sampling, and culturally appropriate considerations in the development and implementation of on-farm food safety plans and protocols. Our two main areas of focus were water quality and culturally appropriate education for Plain Community farmers.

Over the course of grant funding our project team developed and delivered in-person trainings and on-demand educational materials to provide practical guidance to growers as they develop food safety plans and procedures for their farm enterprise. This included videos and other multi-media materials that feature on-farm examples and solutions from Kentucky farmers, and emphasize scale-appropriate solutions from a variety of management. Third, team members conducted research, and developed publications and curriculum to address pre- and post-harvest water testing, interpretation, and mitigation strategies. Finally, we adapted FSMA and other food safety-relevant educational materials and trainings for Plain community growers and identified preliminary strategies for addressing logistic challenges for water testing within this grower community. This includes a printed food safety plan development curriculum based on a prepared binder that has been enthusiastically received by both plain community and broader community producers.

Title: Market Ready Farms Collaboration

Author(s): Andrea Brown, Global Growers Network

The long-term goal of this project is to increase the viability of farm businesses in Georgia and Alabama by providing strong food safety programs that will support market readiness. Specific program objectives will be to: a) Strengthen and expand the existing network of programs and partners to leverage partnerships, increase food safety training capacity, and improve service delivery for food safety education and training programs; b) Increase farmer access to food safety training that is consistent with FSMA guidelines through targeted outreach within existing farmer networks and with strategic pre-teaching of fundamentals that will encourage farmers to pursue more advanced food safety trainings; c) Expand access to PSA Grower Training and Train the Trainer Programs by working across existing farmer networks; and d) Incorporate food safety education into whole farm technical assistance programs so that food safety protocols are operationalized and connected to overall business development. The key partners in this project were strategically engaged to bring well-rounded food safety services to the target audience and to leverage established relationship networks that will increase the reach of resources to a broader group of farmers that have limited food safety training. Program participants will be connected to food safety experts who will help to demystify FSMA regulations and build linkages between farm operations, record-keeping, food safety, and financial management. Participants will leave with a basic understanding of the FSMA rules in order to easily implement on their own farms.

Title: Colorado Produce Safety Collaborative: Regionally Adapted Training and Outreach

Author(s): Adrian Card, Colorado State University Extension
Martha Sullins, Colorado State University Extension
Beth LaShell, Ft. Lewis College
Harrison Topp, Rocky Mountain Farmers Union
Marilyn Drake, Colorado Fruit and Vegetable Growers Association
Robert Sakata, Colorado Fruit and Vegetable Growers Association

The Colorado Produce Safety Collaborative is uniquely positioned to provide Colorado produce growers with a continuum of education around produce safety planning, practices, and regulation that corresponds to specific regional needs. The Collaborative, a multi-organizational team that has been providing education and support throughout Colorado since January 2017, has identified differentiated grower needs through multiple evaluation channels. Team members recognize that Colorado's produce industry is changing, as are the regulatory environment and buyer requirements around food safety. This project offers a suite of educational approaches and opportunities as part of a long-term strategy to address known risks in Colorado's fresh produce industry. This roadmap for educational enhancement will increase produce growers': 1) understanding of produce safety as a key business risk; 2) knowledge about the Food Safety Modernization Act, Produce Safety Rule, new risk management tools and regulatory updates; 3) ability to implement tools and risk management strategies; and 4) community connectivity via an advisory board, regional tours and mentorships. Over the three-year project period, Colorado produce growers will benefit from a series of Produce Safety 101 workshops, 12 good agricultural practices workshops, 9 webinars on risk prioritization and regulatory updates, expert content delivered at three industry conferences per year, enhanced resources and tools housed on the team websites, 9 Produce Safety Alliance Grower training workshops, 15 skill-building workshops, 9 regional tours and 12 mentorships. This project will build produce safety confidence and competence among 420 growers per year by encouraging learning and implementation relevant to Colorado's diverse growing regions. We have executed 2 webinars on risk, 3 PSA trainings, 1 intro class on food safety, 2 experts to conferences, and added additional online food safety content, and begun planning for food safety plan workshops and consultations, and GAPs workshops.

Title: **Development of a Hands-on and Demonstration-based Produce Food Safety Training Curriculum and a “Build Your Own Food Safety Manual Workshop**

Author(s): **Travis Chapin**, University of Florida
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Produce-oriented food safety training increased substantially after the release of standardized FSMA-related curricula. Previous produce-targeted workshop participants have indicated, through focus groups and workshop evaluations, a need for more hands-on scenarios and examples.

The objectives of this project are to: develop training demonstration sites; curriculum modules; deliver the training to target audiences; and assess short- and medium-term learning and impact.

The hands-on curriculum included seven modules: Regulations and recordkeeping; Agricultural water, well inspections, and water testing; Employee hygiene, handwashing stations, and toilets; Preharvest field assessments; Packinghouse hazard assessment; Cleaning and sanitizing harvest containers and food contact surfaces; and Verification of sanitation. Two demonstration sites in Florida were developed at working research farms to conduct the 6.5 hour hands-on and demonstration-based workshops.

In 2018, two workshops were held at each demonstration site (Lake Alfred and Live Oak) to a total of 41 participants. In 2019, one workshop was held in Live Oak to 7 participants and one was held in Naples to 5 participants. Participants benefitted from a practical application of farm food safety evaluation conducted in an informal setting that encouraged independent thinking and group problem solving. A 16 question pre- and post-test evaluation was developed and used to measure participant knowledge gain. Responses were tabulated and analyzed with a Paired Sample T-Test. Matching pre- and post-test results were obtained from 15 participants. All participants significantly ($P=0.000$) increased knowledge; average post-test scores were 92%.

Improved understanding of foundational food safety principles and practices that support the production of safe produce, as well as FSMA compliance, through the visualization of key food safety issues can be developed through hands-on, problem-based exercises at demonstration farms. Stakeholder feedback indicated that the “Build

Your Own Food Safety Manual” curriculum should be developed and offered separately. Covid-19 precautions prevented additional workshops in 2020.

Title: **Improving the Development of Food Safety Plans through the
“Advanced Preventive Controls School” Initiative**

Author(s): **Byron Chaves**, University of Nebraska-Lincoln
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To successfully design and execute an effective food safety plan, food manufacturers require continuous training beyond the foundational PCQI course. Even though current resources provide the foundational knowledge to perform a hazard analysis and to identify preventive control measures for the relevant hazards, there is not a comprehensive advanced course to support small and very small companies dig deeper into the details of developing a food safety plan. Therefore, the long-term goal of this project is to help increase FSMA regulatory compliance of small and very small facilities by building their capacity to develop and implement adequate food safety plans. Specifically, we propose to: 1) Develop an advanced preventive controls for human food training curriculum; 2) Implement the “advanced preventive controls school” training initiative in Nebraska, Guam, and Puerto Rico; 3) Measure the impact of advanced training on the participants’ FSMA PCHF foundational knowledge, attitudes, practices, and ability to develop and implement a food safety plan; and 4) Identify future training needs of food manufacturers in the U.S. Central Plain Region, Guam, and Puerto Rico. We have put together a team of food safety experts to elaborate and expand curricula on hazard analysis and risk assessment, validation of process preventive controls, effective food allergen management, and environmental monitoring programs. The advanced training will be taught in Nebraska, Guam, and Puerto Rico, where impact on participant knowledge, attitudes, and FSMA PCHF practices will be assessed via structured surveys. Additionally, the small and very small food manufacturers in the selected regions will be surveyed for additional training needs. The proposed project makes meaningful contributions to the food safety training of small and very small manufacturers in the US. Central Plains region as well as in US. insular areas, and establishes significant collaborations between the continental U.S., Guam and Puerto Rico.

Title: Identifying FSMA Preventive Controls Training and Technical Assistance Needs of Food Manufacturers in Rural Nebraska

**Author(s): Byron Chaves, University of Nebraska-Lincoln
Dennis Burson, University of Nebraska-Lincoln**

The Current Good Manufacturing Practice, Hazard Analysis, and Risk-Based Preventive Controls for Human Food rule requires food facilities to have a food safety plan that includes an analysis of hazards and risk-based preventive controls to minimize or prevent the identified hazards. The goal of this project is to identify food safety preventive controls for human foods training and technical assistance needs of very small food manufacturers in rural Nebraska. Specifically, we want to (1) determine the readiness/preparedness level of very small food manufacturers in rural Nebraska for the successful implementation of the FSMA Preventive Controls for Human Food rule, and (2) establish “mobile food safety clinics” to support the design and implementation of food safety plans as required by current FSMA regulations. A one-year extension was granted, and the scope of the project was modified. Small and very small manufacturers throughout the State (n = 10) were recruited for a series of facility visits to identify gaps in CGMP and preventive controls implementation and provide technical assistance with the development of food safety plans. Most facilities lacked any knowledge of environmental monitoring for the prevention of *Listeria* contamination. Therefore, four RTE companies that manufacture foods under FDA inspection were selected to map and characterize their facility for *Listeria* spp. contamination and get their environmental monitoring programs (EMP) started. Data collection is underway. The observations from this project indicate that small and very small food manufacturers in Nebraska have little awareness of environmental monitoring requirements even in RTE facilities. Additionally, compliance with CGMP ranged from medium to very high as measured with a standardized rubric. The *Listeria* mapping results will help companies prioritize cleaning and sanitation efforts, support their EMP, and improve the microbial safety of their products.

Title: FSMA Education and GAP Training Targeting Small and Limited Resource Specialty Crop Growers

Author(s): E'licia L. Chaverest, Alabama A&M University
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Small-farm agriculture remains a vital part of Alabama's agricultural economy. Demand for locally grown fresh produce continues to grow in Alabama, Georgia and Tennessee due to increased dietary and health concerns, loss of family farms, and general transition from cotton and broiler production to specialty crops. However, the lack of viable markets and marketing channels continues to daunt the industry. The overall goal of this project was to educate and train limited resource specialty crop producers on FSMA legislation and GAP Preventive Controls for Human Food Rule to increase customer and consumer awareness of GAP certification and produce safety education. The project targets limited resource specialty crop growers in 11 counties and communities in Alabama, Georgia and Tennessee underserved by government programs and in need of outreach education and technical assistance.

AAMU Small Farm Research Center in collaboration with its partners has hosted and co-hosted eight FSMA Produce Safety Alliance (PSA) Growers Trainings, one Integrated FSMA's PSA Training for growers and trainers jointly, and six Produce Safety Farm Field Days. The project has been able to train and educate a total of 176 farmers, extension agents, and food safety specialists. Farm field days centered around PSA modules on food safety compliance regulations. Pre- and post-test surveys reveal that growers have been benefited from the produce safety programing. They usually state they have become more knowledgeable about agricultural water and related regulations, the role of food safety issues in relation to consumers, majority of participating growers acknowledge they better understand the role of the Alabama Department of Agriculture and Industries with respect to food safety; significance of produce safety education; and are more comfortable and confident with produce safety issues. Growers appreciate one-one-consultations and mentoring sessions, and more so, experiential learning activities such as farm tours, field days and hands-on demonstrations.

Title: Food Safety Solutions for Farm Owners and Employees

Author(s): Margaret Christie, Community Involved in Sustaining Agriculture (CISA)
Kristen Wilmer, Community Involved in Sustaining Agriculture (CISA)

Background and Project Importance: CISA is providing farms in our region of western Massachusetts with targeted, individualized support in meeting FSMA guidelines, working in close partnership with University of Massachusetts Extension and the Massachusetts Department of Agricultural Resources Produce Safety Team. We focus on small farms that sell at least 50% of their products direct to consumers; farms and aggregators doing light processing or producing value-added products; and farms that must comply with Produce Safety Rule standards and require sustained, individualized support to enable them to initiate or complete the process. In addition, we help farms provide food safety support and training for farm employees, especially those with low English or literacy skills.

Objective or purpose: To fill gaps in current FSMA-related support by providing targeted, individualized support in meeting FSMA and food safety guidelines.

Methods: Provide individual support to farms and aggregators; support farms in accessing available state and federal resources and training; provide food safety support and training for farm employees, especially those with low English or literacy skills; increase staff and partner staff capacity to provide food safety education; work with partners to share resources and information and to provide comprehensive services.

Title: **Preparing Diverse Beginning Farmers for Growth: New Entry Expands FSMA Training and On-Farm Technical Assistance Through Tiered FSMA Support Mechanisms that Don't Leave New/Beginning Farmers Behind**

Author(s): **Kevin Cody**, Tufts University
Recipient Organization: Third Sector New England
Performing Department: New Entry Sustainable Farming Project

Many wholesale buyers are requiring FSMA [Food Safety Modernization Act] compliance even for Exempt and Qualified Exempt producers. This creates a barrier to entry into the wholesale marketplace for new and beginning producers and small-scale producers as they work to expand their businesses. This project supports socially disadvantaged, limited resource and beginning farmers that are FSMA Exempt and Qualified Exempt by providing both education and training opportunities that will help producers scale up their operations. To accomplish this objective, New Entry developed new food safety curriculum that promotes FSMA PSA compliance and provided instruction through in-person technical assistance and through a new online learning platform and crop production course. In addition, New Entry entered into a partnership with Conservation Law Foundation to build regional legal resources and train regional attorneys to support farmers working to meet FSMA PSR compliance standards.

Results from year 1 of this project (9/1/18-8/31/19) include: a new food safety module for a crop production course, delivered in-person to 15 class participants; two PSA grower trainings co-organized by New Entry; site visits to 6 socially disadvantaged farmers to promote best food safety practices; an on-farm workshop for 12 beginning farmers/apprentices on food safety with hands-on demonstrations; between March and October 2020, over 120 hours of direct TA with farmers to improve businesses and food safety practices. During this period, four New Entry staff attended PSA grower trainings, and two of those also participated in Trainer Training courses. These results demonstrate a significant increase in beginning and socially disadvantaged farmers awareness of FSMA PSR requirements and best food safety practices. Multiple farmers working with the New Entry Food Hub, and the Food Hub itself, are working with new wholesale and institutional outlets with levels of PSR compliance that exceed those required by Exempt and Qualified Exempt producers.

Title: **Implementation of Food Safety and Quality Principles to Address Critical Issues in the Development of a Food Safety Plan**

Author(s): **Shannon M. Coleman**, Iowa State University
Kathrine Gilbert, Iowa State University
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Small food processors have the potential to increase food production in the state of Iowa and, in doing so, create jobs for their local communities. Barriers to many of these processors include their lack of knowledge and understanding of basic food science principles as well as difficulties implementing food safety programs. For year one, the objective of this project was to pilot the development of supplemental online curriculum modules on Current Good Manufacturing Practices (cGMPs) personnel to participants in the ISU Center for Industrial Research and Service (CIRAS) Food Safety Collaboration Program. The team developed two online modules. The modules were broken down into two cGMPs personnel practices that employers should consider before and after entering the production floor. Each module contained four video lectures, a resource page, and a knowledge assessment. Topics addressed in the video lectures were disease control, cleanliness, use of personal protective equipment (PPE), breakroom practices, and glove maintenance. Participants engaged in a pre- and post-assessment, which addressed participants' preparation, intention, subjective norms, and attitude as it related to cGMPs personnel practices. The platform was distributed to current and previous cohort participants summer of 2020. The findings from this research will guide the development of the remaining modules.

Title: **Extending Food Safety, Sanitation and Quality Training to Primary Processor Employees that have Frontline Interactions with Seafood Harvesters.**

Author(s): **Christina A. Mireles DeWitt**, Oregon State University
Angee Hunt, Oregon State University
Virginia Ng, Seafood Products Association

The purpose of this project is to support the expansion of food safety and quality training to an often-overlooked group of individuals at primary seafood processors: fleet managers, dock managers, buyers or equivalent position. Primary processors often focus scarce training resources on individuals in quality assurance and quality control. Fleet managers typically oversee and direct the production aspects of all seagoing vessels including the safety, repair, and maintenance of vessels. Essential functions include working closely with independent fishermen, production and sales personnel to establish production and quality control standards. At some primary processors there is not an official “fleet manager”, but the dock manager or buyer are instead the positions that influence vessel maintenance and product safety, sanitation, and quality control. All of these individuals, however, have critical connections, interactions and communications with fishermen. They, essentially, serve as the frontline communicators of food safety and quality to our seafood harvesters. Seafood harvesters are a hard-to-reach group for training. This project will provide training support for this group of individuals to participate within an existing framework of food safety and quality trainings offered through the Better Seafood Processing School. Activities already have included engagement with processors in collaboration with the Seafood Products Association through a pre-survey sent in Dec 2019. Surveys were shared with 9 individuals representing 5 processing facilities. Survey results were then shared at a full day program development meeting held on Feb 20, 2020 in Seattle. The meeting had 12 attendees representing academia, an industry non-profit, a sanitation service company, and medium to large processing facilities and catcher processors located from northern California to Alaska. Next steps are to repeat the meeting with local small to medium seafood companies. Feedback from both meetings will be used to develop specific training for the frontline communicator cohort.

Title: **Bridging Knowledge Gaps in Food Quality Assurance to Strengthen the Foundation for Food Safety Training and To Ensure the Successful Implementation**

Author(s): Linda Harris, UC Davis
Erin DiCaprio, UC Davis
Luxin Wang, UC Davis
Vikram Koundinya, UC Davis

Developing and implementing the required Food Safety Plans for the FSMA Preventive Controls Rule for Human Food can be very challenging, especially for small and very small processors. The goal of this project is to bridge the knowledge gaps in food quality assurance and its connection to food safety that may hinder small and very small processors from successful development and implementation of robust Food Safety Plans. To achieve this goal, this project team developed a series of four webinars covering basic concepts, techniques, and programs in quality assurance and quality control. Four PowerPoint presentations were developed: 1. Introduction to quality assurance and quality control; 2. Quality control; 3. Microbiological standards; and 4. Environmental monitoring. Each presentation was delivered in a series of one-hour live webinars held in June/July 2019 and February/March 2020. A retrospective pre-/post-test was administered to webinar participants via Qualtrics following attendance. All participants reported an improvement in their understanding of key concepts after the webinar compared to before the webinar in all aspects presented. Additionally, the PowerPoint presentations were used to deliver lectures to students enrolled in Food Quality Assurance course offered in spring 2020. Similar learning outcomes were observed in the undergraduate student cohort. The final deliverable for this project is the recording of presentations and the production of supplementary videos for distribution via online platforms.

Title: **Supporting FSMA Compliance for California’s Regional Food Hubs through Training and Technical Assistance**

Author(s): **Erin DiCaprio**, UC Davis
Gail Feenstra, UC Davis
Gwenael Engelskirchen, UC Davis
Alda Pires, UC Davis

The goal of this project is to improve understanding and adoption of food safety practices among a niche audience of produce distributors, food hubs, thereby increasing the success of regional supply chains through enhanced FSMA compliance. Food hubs, which manage the aggregation, distribution, and marketing of source-identified food products primarily from local and regional producers, are important sales channels for many small to medium-scale farmers, offering transportation efficiency and greater access to markets. The primary deliverables are: PCQI certificates issued to California food hub staff, review of food safety plans, hazard analysis recommendations based on site visits, and the development of FSMA guidance documents specifically targeting food hubs. These objectives will be achieved via technical support trainings (delivered remotely and in person), one-on-one consultations, individualized hub food safety plan development and review, and in person site visits. The project team delivered 3 webinars on the topic of FSMA compliance for the food hub audience, conducted one-on-one site visits to 5 food hubs, and issued 11 PCQI certificates to food hub operators. Food safety plan reviews with 5 food hubs are in progress. Additionally, the team led a ½ day workshop on FSMA compliance for food hubs at the National Good Food Network conference in March. Unfortunately, the COVID-19 crisis has necessitated that food hub participants focus their immediate energy on changing sales channels and staffing needs, and physical distancing requirements prevented the project team from completing our sixth in-person site visit. During summer and fall 2020, the project team will continue to work on developing model SOP templates and a factsheet on FSMA compliance for food hubs. The outcomes of this project will support local food systems in California and increase access to nutritious, safe, fresh produce in communities served by food hubs while improving overall food safety and regulatory compliance.

Title: Community Based Technical Assistance and Training Reaching New Audiences to Help Small Processors Reach FSMA Compliance

Author(s): Majed El-Dweik, Lincoln University

The Lincoln University Food Safety Program will target new audiences of low and limited resource farmers, students and processors addressing the highest needs in recent surveys regarding FSMA. In surveys, delivery of information and services desired included workshops, one-on-one and fact sheets. Top needs for information include soil and water testing requirements and help to reach FSMA compliance. This project addresses the top needs using methods identified as top choices by the farmers. We will build upon the successful Produce Safety training already held in Missouri and target processors and those not yet reached – without duplicating efforts. Showing farmers how soil and water is sampled for collection and providing the testing will provide a highly requested service leading towards FSMA compliance.

Our Innovative Small Farm Outreach Program staff will be trained in FSPC and HACCP. These field staff will then be able to service the small farmers they serve regarding this food safety information. The project manager will become a certified HACCP trainer and lead 4 sessions, for the new audiences, in the two-year grant period. Networking will include regulators, NGO's, farmers markets, extension, food hubs and inspectors. Groups will be formed at the community level to empower the farmers to reach compliance. Agriculture students, our future farmers, will also be trained.

Sharing information and communication is key to success. We will work closely with the North Central FSMA Regional Training Center to keep them informed, use their materials and share information. The LU Food Safety website will be modified to include a FSMA site within and have links to all the pertinent agencies and information.

The long-term goal is to increase FSMA compliance by small and limited resource farmers/processers by providing training, technical assistance and support now and in the future.

Title: Food Safety Outreach and Education for Local Food Systems in California

Author(s): Kali Feiereisel, Community Alliance with Family Farmers

California has the majority of all farms covered by FSMA and has also revised its direct marketing laws to require all direct marketing farms, regardless of size, to implement GAPs. This is creating increasing demand for food safety education and technical assistance tailored to the small farm community. The Community Alliance with Family Farmers (CAFF) has been conducting outreach and education on food safety to small, minority, disadvantaged, and organic farmers in California for the past seven years. In that time, we have reached nearly 3,000 farmers in workshops and helped 250 with their farm food safety plans. We have collaborated with a variety of organizations in this effort, including UC Cooperative Extension (UCCE), California Certified Organic Farmers (CCOF), and various buyers, along with a number of other community-based organizations. This project expands our program and reaches new audiences by 1) partnering with incubator farm organizations and small farmer conferences to provide annual food safety trainings to their farmers; 2) collaborating with five partner farms across the state to provide technical assistance and help them come into compliance with FSMA and then have the farmer explain what they did to other farmers during a field day; 3) continuing to provide one-on-one and small group assistance to groups that reach out to CAFF for more in-depth technical assistance; and 4) expanding on our already extensive library of resources by creating additional factsheets and short guides on specific topics (postharvest, etc) in collaboration with colleagues at UCCE. As of June 8th, 2020, we have provided 14 in-person food safety trainings to 279 people during which we answered over 125 questions. Additionally, we have completed all three webinars that provided different FSMA education to small growers. We partnered with the California Department of Food and Agriculture Produce Safety Program (FSMA Inspection team) on two of the webinars so that growers could ask actual FSMA Inspectors their questions. There was a total of 142 people on those three webinars during which over 20 questions were answered. We added a bonus webinar on April 8th, during which we provided on-farm food safety information for small farmers. The focus of that webinar was to answer the dozens of grower questions we had received related to best practices during the COVID-19 pandemic. We had 102 people on that webinar during which 42 questions were answered. We have provided 1-on-1 technical support to 117 farmers during which we answered nearly 300 questions. We completed our first cohort of Partner Farms, during which we provided more in-depth food safety technical assistance to growers over the course of over a year. We were unable to hold the field days at the end of the program and instead replaced that with a public report on the Partner Farm Program that will be available on the CAFF website by the end of June.

Title: Safety Education Program for Veteran Farmers

Author(s): Han Chen, Purdue University,
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The majority of Indiana military veteran farmers are running small-scale farms. With increasing food safety regulations, they are facing more challenges to comply with regulatory requirements and maintain sustainable farming businesses. There are limited studies targeted at Indiana veteran farmers to understand their unique needs and barriers to food safety education. The objective of this project was to gain a deeper understanding of Indiana military veteran farmers' attitudes, knowledge, and practices toward food safety, identify their food safety education needs and barriers, and evaluate the effectiveness of various educational interventions. This project was composed of an online pre-survey, three educational interventions, and intervention post-surveys. Three different educational interventions evaluated were learning circles, in-person workshops, and electronic newsletters. The effectiveness of educational interventions was assessed by using the pre- and post-survey. A total of 64 veteran farmers completed the online pre-survey. Among the pre-survey participants, 34 completed post-surveys in the intervention evaluation. Although veteran farmers were aware of the importance of food safety, their food safety risk perceptions were low. Major barriers identified by veteran farmers to food safety education were lack of time and limited culturally tailored educational programs. Overall, their knowledge increased after all three educational interventions, and the learning circles appeared to be the most effective format. Electronic newsletters as the most preferred delivery format among veteran farmers increased their knowledge slightly. This pilot project identified the unique needs and challenges of Indiana military veteran farmers in food safety education and displayed the effectiveness of different educational interventions. These findings will guide the decision-making of educators on the development of future food safety education programs for military veteran farmers.

Title: **Improving Access and Motivation for Small and Medium Processors in the Northeast to Be in Compliance with FSMA's Preventive Controls Rule**

Author(s): Jill Fitzsimmon, University of Massachusetts Amherst
Amanda Kinchla, University of Massachusetts Amherst

Small and medium processors (SMP) face hurdles to implementing Preventive Controls for Human Food Rules (PC) imposed by the Food Safety Modernization Act (FSMA), including lack of access to scale-relevant and motivating information. This project will build on previous work to develop scale-appropriate, accessible, and motivating mixed-media content to provide SMPs with the information they need to understand how PC could be implemented in their food business. The goal of this project is to make information regarding Preventive Controls accessible and motivating for small and mid-sized processors. We will develop and deliver mixed-media content to address the knowledge gap that prevents small and medium processors from complying with the PC Rules in the northeast (CT, MA, NH, RI, VT). The long-term goal is to increase the number of processors nationwide that develop and implement FSMA mandated food safety plans, thus serving to reduce the overall risk of foodborne illness.

To achieve these goals, we will focus on three primary objectives: 1) Develop, deliver, and evaluate learnings from Preventive Controls trainings for SMPs to identify gaps in accessibility and opportunities to motivate behavioral change; 2) Develop mixed-media extension content that addresses gaps in accessibility and opportunities to motivate SMPs to increase compliance with PC; 3) Disseminate and evaluate the mixed-media content to implement an accessible and motivating PC program.

This project began in February 2020.

Title: **Online Food Safety Training for New Mexico Food Manufacturers**

Author(s): **Nancy Flores**, New Mexico State University
Paul Gutierrez, New Mexico State University
Sharon Bartley, New Mexico State University

Good Manufacturing Practices apply to processing, packing, and holding of raw agricultural commodities and processed food. Both the state of New Mexico and federal food safety programs require that food manufacturing employees and management must be trained in safe food practices. Therefore, this project will engage with New Mexico's farmer-processors and manufactured food facility operators to assist with implementation of the New Mexico Environment Department Food Code and the Food Safety Modernization Act's Produce Safety and Preventive Controls for Human Foods Rules. The overall goal of this work is to assist New Mexico farmer-processors and food manufacturing operations meet state and federal employee training requirements. Specific objectives include (i) identifying operations that must meet food safety training requirements; (ii) developing or modifying training modules for farmer-processor and manufactured food facilities in New Mexico; and (iii) delivering training modules to manufactured food facilities in New Mexico. After determining which operations must meet these training requirements, modules will be developed for our manufactured food facilities. We will also use the Popular Education model to modify existing materials for Hispanic and Native American audiences and local food processing systems. Following content development and modification, the curriculum will be piloted by focus groups for appropriateness for target audience and usability of the online delivery platform. Comments collected from these groups will be used to modify curriculum as needed before delivery of online certification program. To date, the project team has been assembled and the database of operations that must meet training requirements has been created. Educational content, videos, and other culturally appropriate materials have been used to develop the online training modules. These modules are currently being reviewed by subject matter experts, and comments from these experts will be incorporated into the course prior to pilot testing with our focus group.

Title: Food Safety Outreach, Applied Research, and Technical Assistance by the Public Health Microbiology Laboratory in Nashville

Author(s): Aliyar Fouladkhah, Tennessee State University

With mechanisms such as biofilm formation, quorum sensing, and ability to move towards diversity and “fitness” through vertical and horizontal gene transfer mechanism, continued emergence of organisms with new characteristics in response to evolving agricultural and manufacturing environments is an unavoidable episode. As such, assuring safety of the public against natural and anthropogenic microbial pathogens from food and agricultural commodities is a daunting task and a moving target. Evolving social changes, such as expansion in global travel and commerce, consumers’ demand for minimally processed and ready-to-eat products and increases in at-risk segments of populations are further breeding grounds for emerging, novel, and reemerging infectious diseases associated with food and agricultural commodities.

As a comprehensive legislation with over 50 rules, implementation of vast majority of Food Safety Modernization Act components had recently taken place for small and merging entrepreneurs. Along with the progress in implementation, concerns of the producers and processors, particularly those who undergo new regulatory requirements for the first time in the history of the country, is gaining momentum. FSMA compliance is particularly critical and disconcerting for smaller operations and emerging entrepreneurs. Without food safety regulatory knowledge, these operations had to maintain only limited profit and/or regional market in order to remain within the FSMA exemption “box.” In addition to conducted state-wide food safety outreach events and FSPCA workshops, our presentation discusses food safety outreach, applied research, and technical assistance conducted by the Public Health Microbiology laboratory. Recent unparalleled student success and food safety deliverables are additionally available at: <https://publichealthmicrobiology.education/>

Title: **Produce Safety Spring Training: Engaging Beginning Farmers with Timely and Practical Guidance to Build a Community of Food Safety Practitioners**

Author(s): **Cara Fraver**, National Young Farmers Coalition
 Maggie Kaiser, National Young Farmers Coalition
 Billy Mitchell, National Farmers Union

Engaging with over 1,500 farmers in the past two years, the Coalition has found there remains a relative unawareness of what FSMA dictates and its applicability to smaller farms. While all farmers understand the immediate and long-term benefits of produce safety plans and procedures, it can be a challenge for beginning farmers to allocate time for training and financial resources to supplies or infrastructure that do not provide an immediate return on investment. Our FSOP project supports beginning farmers in successfully building and scaling their farm operations by providing them with the practical trainings and resources they need to effectively, efficiently, and confidently invest in the processes and infrastructure that will enable them to reduce food safety risks. Our approach is direct response to farmer feedback: we proposed to conduct four annual “tours”, each limited to specific regions or states, to provide beginning farmers with tailored information through workshops, trainings, on-farm produce safety walkthroughs as well as an online food safety plan course offering farmer-to-farmer engagement through cohorts of “study-groups.” With insights gleaned from farmers across the country, we will generate practical materials like tip sheets and guides.

Because this is a 2019 project, we do not have any results; and due to COVID-19, we had to cancel the four tours we had planned for 2020. We did, however, shift our programming online and have been conducting a series of food safety farmer focus groups with produce farmers to discuss on-farm produce safety practices and how they can be integrated into farming operations. Each focus group has a specific produce safety topic to narrow the conversation and bring farmers together with similar experiences, is co-facilitated by a farmer who has figured out a great system relevant to the topic, and is recorded so farmers can tune into the conversation at a later time.

Title: **Developing a food safety culture of practice: Addressing the challenges of shared-kitchens and small-scale manufacturing operations.**

Author(s): **Roz Freeman**, CommonWealth Kitchen
Colin Roy, CommonWealth Kitchen

CommonWealth Kitchen, like other shared kitchens and small-scale manufacturers, works closely with aspiring entrepreneurs from early ideation through start-up, from market testing and scaling, to proof of concept and business viability. Many of these early-stage food entrepreneurs and employees have never before engaged with food safety practices or training, have limited educational backgrounds, and learn best in hands-on environments. Through this project, we will provide accessible, engaging, and relevant food safety training to both employees and owners that is critical to maintaining food safety in a shared-use environment. In order to support this practical food safety learning, we are developing a set of interactive training modules that allows users to complete training at their own pace, develop mastery of the content, and demonstrate successful achievement of the learning objectives. The modules are separated into sections that align with stages of growth for a food company and allows employees to learn new content and apply to their work environment before integrating new information. Each module will be tested on employees already working in a shared kitchen environment to develop training materials that are most accessible to our key demographic. We did a food safety knowledge pre-survey of owners and employees at our shared kitchen and plan to test understanding after going through the custom developed modules. This project has not yet been completed, with development and live testing slowed due to COVID-19.

Title: **Hands-On Food Safety Outreach and Education to Socially Disadvantaged Farmers in Santa Clara, San Benito, and Santa Cruz Counties**

Author(s): **Aparna Gazula**, University of California Cooperative Extension
Qi Zhou, University of California Cooperative Extension

Understanding and implementing on-farm compliance requirements for Food Safety Modernization Act (FSMA) and food safety Good Agricultural Practices (GAPs) is very challenging for Socially Disadvantaged Farmers (SDFs) who have significant language barriers, minimal educational background, financial hardships, and lack time commitment and access to technical resources. The goal of this project is to equip SDFs with the knowledge and educational resources needed to successfully implement food safety GAPs and FSMA compliance requirements on their farms. The specific objectives of this project are: 1) Provide customized technical assistance on GAPs and FSMA compliance requirements to SDFs through food safety workshops, Produce Safety Alliance (PSA) grower trainings, on-farm mock inspections, one-on-one technical assistance, and tailgate meetings; 2) Develop culturally relevant food safety educational materials and FSMA required labeling and record keeping templates (in different languages) to SDFs. Outcomes and outputs to date include: 1) Translated into Mandarin – PSA Growers Training pre-/post-tests, FSMA required recordkeeping templates and posting signs, and GAPs templates; 2) Conducted a food safety workshop on Sep 5th 2019 (20 attendees) to introduce FSMA and Produce Safety Rule to growers; 3) Held follow-up “one-on-one meetings” (48 attendees) on Sep 11th, Sep 18th and Oct 2nd with SDFs unable to attend the Sep 5th workshop; 4) Provided assistance with CDFR required self-reporting FSMA survey form. Evaluations showed that the workshop and meetings increased growers’ food safety knowledge and 81% of growers plan to seek food safety technical assistance from UCCE Small Farm Program in the future. Due to the COVID-19 shelter-in-place orders, the April 2nd and 3rd 2020 PSA Grower Trainings and all one-on-one on-farm mock inspections from April through June were cancelled. Currently, we are developing a FSMA on-farm assessment checklist and are conducting one-on-one on-farm mock inspections in counties with COVID-19 Health Department guidelines that permit such activities.

Title: Development and Implementation of Innovative Food Safety Training Tools for the Production and Distribution of Microgreens

Author(s): **Kristen Gibson**, University of Arkansas
Barbara Chamberlain, New Mexico State University
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Sujata Sirsat, University of Houston

The long-term goal of this Collaborative Education and Training Project is to decrease potential food safety risks related to the production and distribution of microgreens—an emerging salad crop for which minimal information is available. First, we will characterize production and distribution aspects of the microgreens industry. Next, we will develop i) novel food safety training curriculum targeting the niche group of microgreens producers and ii) guidance documents for buyers and regulators of microgreens. The add-on curriculum facilitates integration of the FSMA Produce Safety Rule among microgreen growers across the U.S. The primary objectives are:

1. Characterize production and distribution aspects of the microgreens industry.
2. Determine barriers to implementation of risk management practices within microgreens operations using environmental assessments.
3. Utilize science-based evidence to develop commodity-specific training for producers of microgreens.
4. Utilize science-based evidence and regulatory standards to develop commodity-specific guidance documents for buyers and regulators of microgreens.
5. Deliver and evaluate novel outreach materials targeting producers, buyers, and regulators of microgreens.

The proposed research will fill gaps in our current knowledge regarding production practices and operational characteristics of microgreens producers. Microgreens operations are more likely to implement recommended practices customized to meet their specific needs as opposed to generic produce safety recommendations available through PSA grower training courses. Moreover, guidance materials to assist consumers, buyers, and regulators navigating through the emerging microgreens industry will be created. The proposed work specifically addresses the Food Safety Outreach program priority to deliver "customized training to very specific target audiences."

Title: **Environmental Assessments to Customize Food Safety Training for Very Small to Small Producers in the Southeastern United States**

Author(s): **Kristen Gibson**, University of Arkansas
Dilhani Jayawardhana, Clemson University
Thomas Yeargin, University of Arkansas
Angela Fraser, Clemson University

Background: Strawberries are the fifth most preferred fresh fruit in the U.S. Additionally, in the southeastern U.S., very small strawberry-growing operations are common presenting unique challenges to the implementation of risk management practices (RMP).

Objectives: Our goal is to develop a novel ‘add-on’ curriculum for strawberry producers. The objectives to achieve this goal are to: 1) conduct surveys and interviews with very small to small-sized strawberry growers in the southeastern U.S. (SEUS); 2) conduct environmental assessments on very small to small-sized strawberry farms in Arkansas; and 3) develop and evaluate the add-on curriculum delivered to very small to small-sized strawberry growers in Arkansas.

Methods: A survey was designed to collect data from strawberry growers in the SEUS regarding farm characteristics, RMP, documentation practices, and revenue. Descriptive statistics were performed on all variables to determine frequencies and distribution, and inferential statistics were performed to determine associations between farm characteristics and the current implementation and documentation of RMP. In addition, a systematic literature review (SLR) following PRISMA principles was conducted to determine the relationship between physical environmental characteristics of produce farms and RMP.

Results: Of the 90 growers who completed the survey, 75.6% reported themselves or an employee attended food safety training with an increase in the prevalence of food safety training associated with size (revenue and acreage). Implementation of a pre-harvest policy and animal intrusion monitoring were both highly prevalent with 95% and 88% of growers responding ‘yes’, respectively, whereas only 47.8% of growers collected pre-harvest water samples, the lowest response to any RMP for this survey. In regard to the SLR, 36 studies used for the final analysis reported agricultural water were commonly assessed while animal intrusion was the least assessed factor. Only one study used statistics to determine the relationship between environmental characteristics and RMP with the remaining studies simply reported the presence/absence or condition of environmental characteristics.

Key Outcomes: Based on the results of our survey, we suggest food safety training be not only commodity but context (scale) specific in order to best serve the needs of the growers. In addition, the SLR provided further justification to our approach of using environmental context to inform development of commodity-specific curriculum.

Title: Developing Food Safety Outreach Materials for Commercial Kitchens, Home Kitchens, and Incubator Kitchens and Food Producers in West Virginia

Author(s): Megan Govindan, West Virginia University

This food safety outreach project aimed to address a gap in knowledge for resources for agri- service providers producing and processing food in various types of kitchen environments including: home kitchens, commercial kitchens, incubator kitchens and on the farm. This project assisted in the development of resources that are being adapted to meet the needs of the COVID-19 pandemic, which impacted delivery of materials and access to resources. A state-wide food system asset map was developed to identify and assess production, aggregation, and distribution resources at county level using Geographic Information Systems. This comprehensive portal identifies all components of the food system from the local to state level to support direct-to-consumer markets. This GIS work also supported the development of the Farm to School asset map and supplemental curriculum to support agri-service provider use of asset maps to coordinate curriculum delivery and invest in community clusters of community food system activities. The PRECEDE-PROCEED model was applied to develop a cottage food education and recipe to reality program. PRECEDE-PROCEED is an acronym that identifies Predisposing, Reinforcing, and Enabling Constructs in Education/environmental Diagnosis and Evaluation (PRECEDE) and Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development (PROCEED). The website portal for hosting the curriculum and web portal are in development and set to launch fall of 2020. A no-cost extension was submitted for this project to allow time for alternative delivery from the trainer model due to the COVID-19 pandemic.

Title: **Rules to Reality: Practical Application of Produce Food Safety for Small to Midsize Virginia Farms**

Author(s): **Stasia Greenewalt**, Local Food Hub
CO-PD: Amber Vallotton, Virginia Tech
CO-PD: Portia Boggs, Local Food Hub
CO-PD: Sarah Sharpe, Virginia Cooperative Extension

This project will leverage Local Food Hub and Virginia Tech's experience with food safety requirements and connections with key food system stakeholders, including farmers, buyers, and food system advocates, to achieve practical application of food safety practices in compliance with FSMA and the Produce Safety Rule. The partners will create and pilot a program that includes a 6-part workshop modules, on-farm readiness reviews, and online record-keeping resources for 6 farms. All information and resources will be consolidated into a toolkit, to be disseminated to stakeholders throughout the food system.

Title: Expanding Food Safety Outreach to Iowa Beginning Farmers Through the Clean Start Program & Professional Development of Value Chain Coordinators

Author(s): Jason Grimm, Iowa Valley Resource Conservation and Development

Iowa Valley RC&D proposes to improve food safety in Iowa by providing specialized on-farm food safety consultation to small, beginning produce farmers, improving access to and collection of small farm food safety data, and expanding the network of certified food safety professionals. Project Staff will work collaboratively with the North Central Region Center for FSMA Training, Expertise, and Technical Assistance. Project staff will develop the Clean Start Food Safety Program to help small, beginning farmers comply with FSMA guidelines and connect them with regional and state networks of producers and food safety professionals. Educational materials containing locally relevant information will be produced by IVRC&D and will be used in the Clean Start program and distributed to partner organizations. Beginning small farmers will also be trained in digital recordkeeping practices that will enable the aggregation of small farm data for analysis and trend-tracking by the Iowa Food Safety Professionals Network. Concurrently with the production of these educational materials and the Clean Start program, IVRC&D will subcontract Value Chain Coordinators who will attend Produce Safety Alliance Trainer training and USDA GAP Auditor training in order to increase the number of qualified food safety professionals and continue the expansion of food safety outreach in Iowa.

Title: **Expanding the Reach of New Hampshire’s Food Safety Education and FSMA Programs to Include Value Added Processors**

Authors: Heather Bryant, University of New Hampshire Extension
Mary Saucier Choate, University of New Hampshire Extension
Ann Hamilton, University of New Hampshire Extension
Courtenay Simmons, University of New Hampshire Extension (former)
Seth Wilner, University of New Hampshire Extension

Background & Project Importance:

As the trend for value-added products has increased, and laws and infrastructure have encouraged the making and sale of processed foods, the demand for education around topics of food safety practices has increased. The introduction of FSMA has increased the demand for education and skill building so that producers can understand if they need to comply, and if so how to comply.

Objective or Purpose:

To assist small NH food businesses with understanding the how the new FSMA regulations apply to their business; to review Current Good Manufacturing Practices (CGMPs); and, to refresh their food safety knowledge and practices.

Methods:

Three, 2-day workshops were offered that reviewed pathogens of concern and sanitation; development of SOPs and a food safety plan; CGMPs, and who was covered by FSMA Preventive Control regulations. Resources on the relevant topics were shared. Fact sheets for New Americans and others are currently being developed.

Results:

Participants noted that their food safety knowledge increased in:

- Hazards and Foodborne Pathogens,
- Food Safety Planning,
- FSMA compliance,
- CGMPs, and
- SOPs.

Participants noted that their food safety knowledge stayed the same in:

- Employee Health/Hygiene and Cleaning and Sanitizing.

Significance of Key Outcomes:

Post-evaluations indicated participants made many changes to their business practices because of the program including areas where self-reported knowledge stayed the same.

Title: Bi-Lingual and Bi-Cultural Food Safety Trainings for Hmong American Farmers Across the United States

Author(s): Janssen Hang, Hmong American Farmers Association

According to the Pew Research Center, there are over 299,000 (FY 2015) Hmong Americans living in the United States (U.S.) and many of them farm. In fact, many metropolitan areas where Hmong people concentrate, also have vibrant farmers markets because Hmong farmers are such great growers. But the problem is that Hmong farmers are working hard, and barely making it. The Pew Research Center also found that while only 15% of all Americans lived in poverty in 2015, in the Hmong community, that rate was almost double (28%). How can we help Hmong farming families stay farming and build intergenerational and community wealth?

The overarching goal of this proposed project is to build the capacity of Hmong farmers around food safety so that they can comply with the Food Safety Modernization Act and the Produce Safety Rules (FSMA), stay in farming, and ultimately, leave behind a strong legacy for their family members and community. We hope to accomplish that by achieving the following sub-goals or objectives: Introduce Hmong farmers from multiple states and regions to FSMA and its significance; Train Hmong farmers on the rules and regulations outlined in the new law; Decrease any misunderstandings, fears or anxiety associated with FSMA compliance; Improve relationships between Hmong farmers and FSMA governing or inspection entities in the respective states; Build a national pipeline of bi-lingual and bi-cultural Hmong FSMA trainers; Support the creation of local community based organizations or cooperatives led by Hmong farmers; and Support the creation of a robust national network of organizations that work with Hmong farmers.

In order to accomplish these sub-goals, the Hmong American Farmers Association (HAFA) and our partners (Fondy Food Center in Milwaukee, WI; North Carolina State University in Taylorsville, NC; Herr's Little Farm in Hillsboro, OR; and Pike Place Market in Seattle, WA) will adapt and enhance existing food safety curricula for Hmong farmers (many of whom do not read or write Hmong or English); conduct bi-lingual and bi-cultural food safety training workshops for hundreds of Hmong farmers in Minnesota, Wisconsin, North Carolina, Oregon and Washington state; and increase the pool of Hmong speaking food safety trainers by recruiting and supporting Hmong bi-lingual and bi-cultural agricultural staff members across the country.

Title: **Continuing Implementation of FSMA in the North Central Region Through a Stakeholder Engagement Framework**

Author(s): **Joseph M. Hannan**, Iowa State University
Angela M. Shaw, Iowa State University
Anirudh Naig, Iowa State University

Ensuring the food safety of fruit and vegetables in the U.S. has been an on-going challenge because of the complexity of the growing environment and the supply chain. The overarching goal of this project is to support the infrastructure of the national food safety program by communicating and coordinating information within the North Central Region (NCR) related to the Food Safety Modernization Act's (FSMA) Produce Safety Rule and Preventive Control Rule. This goal is being achieved through six specific objectives, 1) expand the successfully established produce safety network within the NCR; 2) develop and implement a communication system; 3) provide support to Food Safety Outreach Program Awards; 4) review of FSMA add-on materials and alternative curricula; 5) provide professional development for a cadre of regional FSMA trainers; 6) provide technical assistance to growers, processors, and vendors in the NCR. Highlights from year 2 of the project include hosting a virtual annual conference, developing the alternate curriculum review process, and supporting our stakeholders. The NCR FSMA Center was scheduled to host its second in-person annual conference in Eau Claire, WI on April 1st and 2nd. However, due to the Covid-19 pandemic, the conference was modified to a one-day virtual conference on April 2nd where ninety-two people attended. The alternate curriculum process and supporting documentation has been developed with testing of the first two of three review stages underway using the curriculum provided by the National Sustainable Agriculture Coalition. The center continues to support our stakeholders with mentorship opportunities, monthly newsletters and open discussion forums, as well as providing infrastructure for regulators across the region to calibrate prior to inspections. Achieving these objectives will result in long-term impacts on the region and the nation, reducing the incidences of foodborne illness and laying the groundwork for a safer food supply.

Title: Latino Immigrant Farmers Trained in Organic Farm Food Safety (LIFT OFFS)

Author(s): Nathan Harkleroad, Agriculture and Land-Based Training Association
Antonio Acosta, Agriculture and Land-Based Training Association

The Agriculture and Land-Based Training Association (ALBA) is a 501(c)3 non-profit organization with a mission to **create economic opportunity for limited-resource and aspiring organic farmers through land-based education in the heart of the Salinas Valley**. With a 100-acre training facility, ALBA's 5-year Farmer Education and Enterprise Development (FEED) program serves over 70 participants annually. FEED includes a year-long bilingual Farmer Education Course. Graduates of the course can proceed to the Organic Farm Incubator where over four years participants gain access to subsidized land, equipment, and technical assistance in a supportive environment while growing up to 5 acres of organic vegetables and berries

Food safety is an essential component of small farm business management in terms of protecting human health, complying with regulations, and accessing markets. LIFT OFFS addresses an urgent need to provide food safety training and technical assistance. Objectives include: to develop knowledge and strengthen capacity for 120 beginning, Latino-owned farms on the Central Coast with respect to GAPs, FSMA compliance and food safety management. This includes 60 graduates of ALBA's programs (i.e., alumni) and other regional farmers. Another 180 farmworkers, students and food safety professionals will build knowledge and skills through the project. The expansion of services to new groups both at ALBA and around the region is made possible through collaboration with partner organizations, such as, Hartnell Community College.

The methods will include culturally appropriate programming with the use of classroom instruction, demonstration, and one-on-one field, audit and record-keeping assistance. Lessons will be repeatedly reinforced in the classroom, office and the field to gradually enable farmers to gain comfort with independent food safety management.

Title: Preventive Controls Training for Small Alabama Fruit and Vegetable Processors Subject to FSMA

Author(s): Tung-Shi Huang, Auburn University
Jean Weese, Auburn University
Luxin Wang, University of California-Davis

Under the Food Safety Modernization Act (FSMA) law, produce growers or processors should be covered under are the Preventive Controls for Human Food or Produce Safety Rule regulations. In the state of Alabama, there are approximately 400 covered produce growers or processors, but many of them are small fruit and vegetable growers that will be exempt from the Produce Safety Rule. As the Preventive Controls regulation is still relatively new, many produce processors, especially small and very small processors, are very confused with the Produce Safety Rule and the Food Safety Preventive Controls regulations. There is a need to get these small and very small processors trained so that they are able to clearly understand the rules, have a Preventive Controls Qualified Individual, and have a Food Safety Plan developed. To achieve this goal, the project team works with the Alabama Department of Agricultural Industry to identify small and very small produce processors in the state. The team has already identified the major locations for the training workshops at Auburn, Birmingham, Fairhope, Huntsville, Mobile, and Montgomery in Alabama. The learning outcomes of participants was evaluated by sending out a training survey after the completion of the training. The ultimate goal of these training workshops is to ensure that all of the participated small and very small processors have their Food Safety plan developed. The project team includes nine food safety regional extension agents to assist these processors. Both the trainers and these regional extension agents worked closely with the processors if the processors had their Food Safety plans issues. More than 400 workshop flyers were sent to produce growers and processors and food processors within the State of Alabama. Ten 10 Preventive Controls for Human Food have been held with a total of 76 participants. Three post training surveys from participants were received.

Title: Expanding FSMA Produce Safety Rule Outreach to Underserved Diversified Fruit and Vegetable Farms in Minnesota

Author(s): Annalisa Hultberg, University of Minnesota

Minnesota is home to a large number of Latino, Hmong, African, and Amish/Mennonite fruit and vegetable farm owners who need tailored educational materials and technical assistance around the FSMA PSR. Furthermore, there are over 2500 fruit and vegetable farms in the state (NASS, 2017), yet only approximately 50-100 are fully covered by the FSMA Produce Safety Rule and subject to inspection. The purpose of this project was to create materials to help these underserved groups understand their coverage status and the basics of the provisions of the PSR including qualified exempt status.

Key activities in this project were developed with input from an advisory board consisting of farmers from underserved communities, food hubs, regulators, Extension and non-profit staff. Key outcomes of the project include in-person educational offerings as well as the creation of written and video materials. New communications materials included a professionally produced 7-minute video on coverage status (will be translated into Spanish and Hmong), 3 short how-to videos on GAPs concepts relating to the FSMA PSR, 8 updated GAPs and PSR factsheets (translated into Spanish and Hmong), a sample Training Guide for Small Farms including a simple training agenda, and a Qualified Exempt factsheet and accompanying webinar. In-person educational outreach included a series of trainings for immigrant and minority farmers on specific aspects of the FSMA PSR including employee training, water testing and cleaning and sanitizing. Notably, these trainings were developed to be tailored to the needs of the underserved farming population – a professional interpreter was present where needed, farmers co-presented to bring material to life, and the practical, non-regulatory and hands-on components were highlighted. Finally, the project worked with the large network of non-profit and agricultural support organizations in the state to provide their staff with information about the FSMA PSR, qualified exempt status and GAPs.

Title: **Food Safety Education and Outreach Programming for Plain Growers (Amish and Mennonite)**

Author(s): **Sanja Ilic**, The Ohio State University
Melanie Lewis Ivey, Ohio Agricultural Research and Development Center

Background and project importance:

As the number of limited resource farmers in the US increases there is a need to develop food safety materials and trainings that address such producers. The Ohio State University Fruit and Vegetable Safety Team (OSU FVST) has provided educational outreach services to Ohio's produce growers for on-farm produce safety. The GAPs educational class offered by OSU FVST covers common routes of microbiological contamination on the farm and identifying potential risks and methods of risk reduction.

Objectives:

While the GAPs class has been presented to approximately 6000 produce industry stakeholders, it was evident that program availability and delivery methods should be modified to better meet the needs of Plain growers in Ohio and surrounding states. We have developed GAPs trainings that addresses the unique farming and handling practices and communication requirements of Plain growers in the region.

Methods:

We worked with Plain growers to capture the practices and collect the food safety management examples and solutions from plain farms. We adapted the language and integrated cultural to reflect the Plain (Amish and Mennonite) community and used the images from plain farms only.

Results, significance and main outcomes:

We piloted the developed Plain grower GAPs trainings with distinct Plain settlements (orders) in Ohio and disseminated materials to using OSU extension network and other states with Plain grower populations through North Central Region Center for FSMA Training, Extension and Technical Assistance. Our publication *Plain Grower GAPs Guide* was awarded 1st place in the OHIO CHAPTER, National Association of County Agriculture Agents (NACAA) Communication Awards 2020, Publication Category, and was the Regional Finalist for the North Central Region.

Title: **Customized Food Safety Education Strategy for Hard-To-Reach Audiences in the Western Pacific Islands**

Author(s): **Jang H. Kim**, University of Idaho
Joshua Bevan, University of Idaho
Jian Yang, University of Guam
Virendra M. Verma, Northern Marianas College
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More than 48 million people are sickened by foodborne illness in the United States each year, with 56,000 hospitalized at a total cost of \$50-\$80 billion. The Food and Drug Administration's Food Safety Modernization Act (FSMA) was passed by the US Congress in 2011. It requires food processing, manufacturing, shipping, and other regulated entities to analyze their safety hazards and design and implement controls to reduce or eliminate these hazards. The FSMA improves foodborne illness surveillance systems in the US and most countries exporting food and agricultural commodities to the US. Although foodborne disease and food contamination continue to be significant public health issues across the US territories, commonwealths, and states freely associated with the United States in the Western Pacific, the region has not prepared for the FSMA due to a lack of timely training opportunities and geographic barriers. According to the World Health Organization, foodborne diseases continue to be significant public health issues across the Western Pacific region.

While it is imperative to provide current food safety information and education to local farmers, processors, and other important members in the food system, few food safety professionals in the region have had access to appropriate food safety information. This project will provide food safety education and trainings to extension agents/educators, public health agents, and agricultural professionals/paraprofessionals in the region. These trained food safety professionals will then provide current food safety trainings and information to socially disadvantaged and isolated very small farmers, processors, and other stakeholders within their jurisdictions.

Title: **Building and Launching a Food Safety Management Training for Small and Emerging Food Businesses: Integrating a Food Safety Culture from Concept to Commercialization**

Author(s): **Amanda Kinchla**, UMass
Chris Von Achen, UMass
Nicole Richard, URI
Lori Pivarnik, URI

The development of shared-use processing facilities and incubator kitchens has created opportunities for small and emerging food businesses yet this audience is most challenged with navigating their way through regulation and food safety compliance while still delivering a safe, high quality food product that can be profitable and make a local economic impact. Therefore, to increase access and consumption of locally and regionally produced agricultural products, there is a strong need to provide a focused educational delivery of customized training and technical support to food entrepreneurs to understand critical food safety considerations from concept to commercialization. We will share the status of an on-going Food Safety Outreach Program (USDA) project that aims to increase market opportunities for locally produced food products by providing food safety training relevant to food product development. Integrating the culture of food safety into the product development process from the beginning streamline the process to help entrepreneurs launch local food products more successfully. The developed program and technical support were specifically targeted to small entrepreneurial processors that are in need of technical assistance to develop local food products. Key concepts from the FDA recognized Food Safety Preventive Controls Alliance Preventive Controls for Human Food (PCHF) standardized curriculum was modified to meet the current needs of the target audience and better prepare them for making the transition from FSMA-PCHF exemption to compliance as their businesses grow. The overall program includes a multi-state collaboration that included partners from extension, food hubs/processing centers, and other partners within the food system to develop and implement a sustainable food safety training program customized to small and emerging food businesses (SEFB). This status update will share key findings from a needs assessment, share the highlights of the developed program (and program evaluation results), and discuss the critical technical challenges still needed to support SEFB.

Title: **Practical Tools for Food Safety on Small, Diversified Fruit and Vegetable Farms**

Author(s): **Kavita Koopa**, Global Growers Network

The long-term goal of this project is to strengthen the supply chain in Georgia for sustainably produced fruits and vegetables for local distribution. This project offers practical tools for food safety for small- and mid-size farmers through: a) coordination of services among partner organizations, b) facilitation of farmer-to-farmer exchanges at field days and workshops, c) integration with NOP certification assistance, d) engagement of major Georgia food buyers in development of second party food safety audits, e) development of infrastructure toolkits for FSMA-compliant wash, pack, and storage facilities, and f) data collection to inform future farmer-centric education and outreach. We worked with a total of 85 workshop participants. Staff and consultants from the Georgia Fruit & Vegetables Growers Association provided food safety expertise at each event, along with representatives from UGA and FVSU Extension offices and NRCS agents. The eleven workshops were divided into three categories (Water and Employee Training Workshops, Soil, Compost and GAP Readiness Workshops, Soil, Compost and GAP Readiness Workshops). By offering topics under these categories, we responded to the needs of our target market by providing meaningful topics that related to food safety. We segmented the state into 4 quadrants to increase the opportunities for farmers to attend workshops. As of November 2019, more than four hundred hours of technical assistance on organic certification transitioning and many aspects of small farm food safety was provided to more than one hundred farmers. Twenty farmers were given about five hours of technical assistance, forty farmers were given about three hours of technical assistance, ten farmers were given about eight hours of technical service, and five farmers received about ten hours of technical assistance. Also, fifty farmers were given an hour or less of technical assistance.

Title: Western Regional Center to Enhance Food Safety Continuation

Author(s): Jovana Kovacevic, Oregon State University
David Stone, Oregon State University
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The Western Regional Center to Enhance Food Safety (WRCEFS) is one of four U.S. regional centers that coordinates food safety training programs relevant to the Food Safety Modernization Act (FSMA). The primary goal of the WRCEFS-Continuation (2018-2021) is to build on the collaborative infrastructure in the Western region to support the delivery of FSMA-related training, education, outreach, and technical assistance. Specific objectives include: (i) facilitating continuing education opportunities for our trainers; (ii) coordinating regional communication strategies and annual meetings; (iii) establishing standardized protocols for add-on curricula reviews; (iv) identifying subject matter experts to participate in existing FSMA-related technical assistance networks; and (v) evaluating the impact of education, training, and technical assistance in the Western Region. Since 2018, three Produce Safety Alliance (PSA) train-the-trainer (TTT) courses and two annual meetings have been held; one FSPCA Preventive Controls for Human Food TTT has been scheduled. The WRCEFS 4th Annual Meeting was hosted remotely, with 37 speakers and 92 attendees. Two Produce Safety Professional Development workshops, developed in collaboration with PSA and New Mexico State University, were held in May (n=23) and July 2020 (n=25). Other planned educational opportunities in 2021 include a GMP-based TTT course and an Advanced PSA Training workshop. Over the past two years, the WRCEFS partners and grantees have provided more than 93 workshops and trainings to our stakeholders across the Western Region. To facilitate communication across the region, in-person and online meetings, monthly newsletters, the WRCEFS website, and social media have been actively used. As of May 2020, our website has been viewed by 1,633 users and we reached 167 people by newsletter. We also engaged with 71 followers on social media. Through our 18 Twitter postings, we have received 6,609 impressions and 295 interactions with our links and content. The add-on materials peer review process has been developed in collaboration with the Northeast Center to Advance Food Safety. This three-stage process includes a peer review request, quality check, and peer review step. It is fully incorporated into the Food Safety Resource Clearinghouse. It is currently in the pilot stage, with anticipated official launch in July 2020.

Title: Enhancing Food Safety Practices and Introducing FSMA Regulations in Shared-Use Commercial Kitchens Across Florida

Author(s): Matthew D. Krug, University of Florida
Sebastian Galindo, University of Florida
Travis K. Chapin, University of Florida
Imran Ahmad, Florida International University

Shared-use commercial kitchen facilities (i.e. incubators, accelerators) have become widespread across Florida. Due to the nature of shared-use facilities, food safety practices such as proper sanitation and allergen controls are critical so that businesses are not negatively affecting others in the same facility, but new food entrepreneurs may have little to no food safety background. Furthermore, federal regulations for food processing facilities have recently been enhanced by the Food Safety Modernization Act (FSMA) which created the Preventive Control for Human Foods (PCHF) Rule. Although new food businesses operating out of a shared-use facility may not be subject to the full provisions of the PCHF Rule, they still must follow Current Good Manufacturing Practices (cGMPs). These food entrepreneurs should also learn the basic concepts of the PCHF rule to prepare for future business growth or buyer requirements. In this project, we propose to (1) develop curriculum (e.g. workshop materials and activities) updated with FSMA requirements, (2) develop human and organizational capacity required for understanding and applying relevant food safety practices in shared-use commercial kitchens across Florida, and (3) implement a monitoring, evaluation, and learning (M&E+L) plan to assess quality and effectiveness of the developed products and activities. The workshops will take place in shared-use facilities and use demonstrations and hands-on activities to help participants visualize and practice proper techniques to implement food safety practices that meet cGMP requirements. Participants will also leave with a basic understanding of the PCHF rule and framework to implement these concepts into their own operation.

Title: **Infotoons and Videos as Delivery Tools for Food Safety Training**

Author(s): **Robson Machado**, UMaine
Jennifer Perry, UMaine
Barbara Chamberlin, NMSU
Pamela Martinez, NMSU

Foodborne disease outbreaks are a significant issue in the US and educating food producers and consumers is the best way to tackle the problem. Understanding what causes these outbreaks requires learning some abstract scientific concepts. Presenting these concepts in the easiest way to understand them can be a useful tool to minimize the number of outbreaks.

The objective of this project was to create informational videos/cartoons (Infotoons) to couple real-life food-safety scenarios (video) with animations of abstract concepts to minimize the cognitive load required to understand them.

Scripts with the most commonly hard-to-understand food safety concepts—identified by a needs assessment with multiple experts—were created to be made into 3-5 minute Infotoons. Videos of numerous farms and food production areas were captured in Maine during a week-long visit of a filming crew from NMSU. The footage is being combined with animations and voiceovers by NMSU.

A preliminary survey was done with two finalized Infotoons, bacterial exponential growth and cross-contamination significantly increased college-aged students' understanding of the concepts presented (on a scale of 0 to 10) from 4.48 to 8.05 and from 5.39 to 8.44 respectively. The survey showed the Infotoons to first-year students that were likely not to have taken any microbiology or food safety related classes. Videos were shown, and students were asked to self-assess their knowledge about the core concept before and after seeing the video (pre-then-post test).

The preliminary results are encouraging and highlight the possibility for short educational videos that focus on one concept to be used as educational tools for both students as well as during food safety trainings focused on the food industry.

Title: **Enhancing Produce Safety for Underserved Farmers in Louisiana**

Author(s): **Fatemeh Malekian**, Southern University Agricultural Research and Extension Center
Chelsea Triche, Southern University Agricultural Research and Extension Center
Achyut Adhikari, Louisiana State University Ag Center

Farmers need assistance with produce safety especially if they are growing produce that is consumed raw. This can only be achieved through produce safety trainings. The Food Safety Modernization Act (FSMA) produce safety grower trainings and Good Agricultural Practices (GAP) workshops are two programs that assist farmers to reduce the risk of microbial contamination of fruits and vegetables during production, harvest, and packaging. Therefore, the objectives were: 1. To conduct 10 (5 per year) Produce Safety Alliance (PSA) grower trainings in conjunction with GAP workshops, 2. To assist 20 underserved farmers to develop and follow Farm Food Safety Plans (FFSP) and 3. To assist at least 20 farmers to apply for the GAP certification program. Since 2019, The Project Director (PD), the project coordinator and students have modified and developed: FFSP template, FFSP guide and checklist, power-point presentations, GAP knowledge assessment, GAP workshop evaluation, customizable farm board activity, farm map risk assessment placemat, and updated/modified logs. We have conducted three two-day PSA trainings followed by GAP workshops. We have also helped five farmers in the writing process of FFSP, and three FFSP have been edited and sent back to the farmers. The project team has published a poster and three fact sheets to inform the public, extension personnel, and the farmers on key areas/topics that are farm food safety concerns. The PD and project coordinator attended several conferences, meetings, trainings, and events and shared the information with the public and extension community in Louisiana and beyond. Unfortunately, the mock audits that were scheduled for spring of 2020 had to be cancelled due to COVID-19. However, we are continuing to work with our farmers through emails and phone calls to ensure that they are ready for the next steps (to be audited) in this process.

Title: **Local Produce Safety Initiative**

Author(s): **Karen McSwain**, Carolina Farm Stewardship Association
Chloe Johnson, Carolina Farm Stewardship Association
Kim Butz, Carolina Farm Stewardship Association

The Local Produce Safety Initiative is a collaboration between the Carolina Farm Stewardship Association, South Carolina State University's Small Business Development Center, North Carolina Agricultural and Technical State University Extension, and North Carolina State University Extension that will further develop and implement outreach and education on Food Safety Modernization Act regulations and Good Agricultural Practices specifically for historically underserved farmers and organic production systems. The long-term goal is to provide equal opportunities for small-scale, limited-resource, historically underserved, and new and beginning farmers in distressed counties in North and South Carolina, seeking access to high-value markets for local foods in Carolina communities. Specifically, we will 1) review and modify existing training material and curriculum and develop technical fact sheets on biological soil amendments of animal origin, water use, navigating the approved supplier list, and using sanitizers, 2) conduct twelve 1-day workshops covering Principles of Fresh Produce Safety and Navigating the GAP Audit to 180 workshop participants, 3) conduct twelve 1-day workshops covering Food Safety Program and Plan Development to 180 workshop participants, 4) provide direct Food Safety Program and Plan Development assistance to 90 small-scale farms seeking GAP certification, and 5) and provide 15 PSA Grower Trainings to 225 program participants, three workshops will be conducted in Spanish.

Title: Sullivan County Food Outreach Project

Author(s): Melinda Meddaugh, Cornell Cooperative Extension Sullivan County

Cornell Cooperative Extension Sullivan County (CCESC) and our partners are working with our stakeholders and fruit and vegetable producers to increase technical assistance to producers exempt from the Produce Safety Rule, increase food safety training opportunities available in the region for small and medium sized farms, provide additional resources to producers covered by the Produce Safety Rule, and provide training and consulting opportunities for producers seeking a third-party Good Agricultural Practice (GAP) audit, through building the capacity of CCESC.

The objectives of the Sullivan County Food Safety Outreach Program for Sullivan and Delaware County producers are to increase the food safety knowledge and training for small and medium sized agricultural producers by 60%, while decreasing the number of foodborne illnesses, increase the number of producers with Food Safety Plans and GAP Audits, increase the number of producers that are NYS Grown and Certified and have the ability to sell to the Catskills Food Hub and increase access to safe and nutritious food for low income communities and decrease foodborne illnesses.

To date we have assisted three producers with completion of their FSMA plans, while two additional plans are in progress. We have hosted three workshops: a 2 Day FSMA Training, Writing a Farm Food Safety Plan and a FSMA Health and Hygiene with NYCAMH workshop. In total, 19 producers have attended. We have postponed two workshops due to Covid-19: NYS Grown and Certified/Organic workshop and a Wholesale and Recordkeeping workshop. We have also developed fact sheets and surveys for data gathering and establishing benchmarks. Since this project was initiated in 2019, we do not yet have project results and outcomes

Title: Heritage Organic Dry Farming Safety Training Program

Author(s): Fathiyyah Mustafa, SCF-Organic Farms, Ltd.
Shaheed Harris, SCF-Organic Farms, Ltd.

The Heritage Organic Dry Farming Safety Training Program technical assistance will help with providing Good Agricultural Practices (GAP) and sustainability of local food networks in the South Carolina and South East Region. Working with beginning farmers and socially disadvantaged producers with these demonstration plots and providing technical assistance to take the good agricultural practices into the field and the markets will: 1) increase the quality of production for farmers and producers; 2) assist the socially disadvantaged producer's farmer's cooperative to expand their presence and markets profitability. The "Heritage Organic Dry Farming Safety Training Program" will allow SCF Organic Farms to achieve that goal by coordinating a solid, well-trained network of small, sustainable growers with the skills and resources to meet long-term, growing demand for healthy, local farm produce among people of all income levels. SCF's Strategies for achieving that Primary Goal with the proposed grant are the seven tasks offering the technical assistance most needed by the farmers and community it serves: Task (1) Complete an Organic Production System Plan Workshop detailing the steps to organic certification; (2) Conduct Mobile Produce Distribution Workshop for using methods to distribute produce more efficiently; (3) Food and Safety Compliance Workshop introducing farmers to GAP certification to help increase safety in small farms production; (4) Conduct Seed Saving Technique Workshop for an increase in produce production and varieties; (5) Conduct Produce Packaging and Labeling Workshop with focus increasing shelf life, marketability, and traceability; (6) Conduct Farm Tool and Supply Safety Identification Workshop to demonstrate how to safely use, clean and store farm tools and supplies; and (7) Conduct Perennial Workshop using methods to produce plants that are low maintenance and produce every year such as asparagus, turmeric, ginger, grapes, and blueberries. The above are the technical assistance that SCF-Organic Farms, Ltd has provided to assist participants who enroll in the Heritage Organic Dry Farming Safety Training Program.

Title: Developing a Handbook of Produce Safety Standards for Buyers

Author(s): Elizabeth Newbold, University of Vermont
Hans Estrin, University of Vermont
Wesley Kline, Rutgers University
Jennifer Matthews, Rutgers University

There are a variety of produce safety standards and verification systems which have led to more complex relationships between producers and buyers. There is a need for educational materials that support easier navigation of the standards to support sustained economic efficiency and produce safety transparency. The goal of the proposed project is to improve produce safety knowledge, communication, and alignment among buyers and producers. We will accomplish this by developing an online Handbook of Produce Safety Standards for Buyers to ease communication and align expectations. To begin, this project has articulated all relevant state and federal specific produce safety standards across the Northeast Region and will begin cross calibrating this fall. This captures the review and summarization of all relevant individual Northeast state and federal voluntary and regulatory produce safety information. We will then develop an Online Buyer Handbook based on specific produce safety standards. This will allow a buyer to search, based on state, the understand state specific voluntary and required standards that impact their selling producer. Finally, we will extend the project results through education and outreach where we will connect buyers to this resource through existing local buyer educational programming supported by partners within the NECAFS network.

Title: **The Northeast Center to Advance Food Safety (NECAFS)**

Author(s): **Elizabeth Newbold**, University of Vermont
Chris Callahan, University of Vermont
Betsy Bihn, Cornell University
Amanda Kinchla, University of Massachusetts
Luke LaBorde, Penn State University

The Northeast Center to Advance Food Safety (NECAFS) was established in 2016 with the long-term goal of providing a sustainable, comprehensive food safety training, education, and technical assistance program that assists small- and mid-sized food producers and processors with FSMA compliance. To accomplish this, NECAFS has focused on establishing a regional structure for food safety communication and collaboration, building regional trainer capacity and competency, developing supplemental materials and delivering educational events, evaluating performance, and sustaining good work. This collaborative structure works together to articulate new, tailored and comprehensive activities, to address the specific challenges identified among producers and processors across the region. From there, these specific activities are executed by collaborative efforts across the region. Most notable accomplishments to be developed from this regional comprehensive approach include: The Food Safety Resource Clearinghouse: a central location for produce safety and preventive controls related resources (go.uvm.edu/clearinghouse); a National Water Lab Map: an interactive map that provides location and contact information for water labs capable of completing at least one of the approved tests for the Produce Safety Rule (go.uvm.edu/waterlabmap); creation of Preventive Controls Workgroup that focuses on supporting awareness of the PC rule, evaluation of PC courses, and access to resources for small and very small processors; creation of a Needs Assessment workgroup that conducted a systematic literature review of all published needs assessment across the Northeast summarizing that information into one location; direct funding to support the attendance at PSA, FSPCA, and SSA trainer courses and the delivery of educational programs that teach the associated curriculum; several external grant awards to fund large projects articulated by NECAFS network; and the NECAFS Annual Conference and Meeting that brings together over 150 extension educators, community-based organizations and state department of agriculture to facilitate a 2 day meeting with parallel sessions where these tailored and comprehensive activities are identified.

Title: **Strengthening FSMA Agricultural Water Outreach and Education for Produce Growers in Kansas and Missouri**

Author(s): **Londa Nwadike**, Kansas State University and the University of Missouri
Sara Gragg, Kansas State University
Valentina Trinetta, Kansas State University
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Azlin Mustapha, University of Missouri
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Touria Eaton, Lincoln University
Don Stoeckel, Cornell University

Through a 2016 NIFA Food Safety Outreach project and other activities, Kansas State University, the University of Missouri, and Lincoln University have been working together on produce safety outreach related to FSMA and have identified water quality as a significant issue. The goals of this project (funded in 2019) are to improve the food safety of produce grown in Kansas and Missouri and improve market access for small-scale Kansas and Missouri growers through increased FSMA compliance. The following objectives are envisaged to achieve these goals: 1) Develop and administer a survey to Kansas and Missouri produce growers to learn more about their knowledge and current practices related to water quality; 2) Conduct a pilot study to trace sources of generic *Escherichia coli* found in 5 ponds used for produce irrigation; 3) Establish demonstration systems at 2 farms to validate effectiveness and educate growers on controlled treatment methods for surface water for post-harvest use; 4) Based on the survey results, pilot, and demonstration systems, develop and translate training materials to help growers better understand the importance of, and the procedures for, monitoring and improving water quality in produce; and 5) Provide cost-free water testing to Kansas and Missouri produce growers to enhance understanding of their water quality. We will continue to work with relevant local stakeholders in both states, as well as the North Central Regional FSMA training center and the Produce Safety Alliance to accomplish these objectives. The project will engage broad audiences in both states, including minority producers and beginning farmers.

Title: **Hawaii Roots Food Safety Community Outreach Project: A Look at Food Safety Through a Cultural Lens**

Author(s): **Sharon Kaiulani Odom**, Kokua Kalihi Valley

This project builds upon the success of KKV's previous Food Safety Outreach pilot project, expanding both the reach and content of developed curriculum. The strategy is to use feedback given from past participants, develop new networks, and include cultural historical knowledge and practices in the new curriculum and delivery mode.

Goals of this project included an update to the curriculum to reflect new regulations relevant to the community and to address a minimum of 5 additional food commodity or safety issues. Research and curriculum writing were a lengthy process, but we developed modules that combined our Hawaiian agricultural and food practices with modern day food safety.

The five new sections are entitled; Mo`olelo, Maiau, Kuleana, Waiwai and Hanauna. These are values that are important to us and will open each module. We will explain more about these sections during the meeting.

It was our intent to provide 5 trainings on Oahu and 3 on the outer islands, and target farmers who were not engaging in the more mainstream presentations. Our first site was the island of Lāna`i, one of our smaller islands. Over 25 attended and were very appreciative that they were the first. They are often overlooked or asked to travel to one of the other islands for trainings. There were a variety of small farmers who had many questions about the guidelines. At the end 100% were glad they attended, 100% found the information useful and 95% said they would share the information.

We were in the process of finalizing our schedule for the remaining workshops through University agricultural classes, Go Farm, small farms and community organizations. With travel, school and community gatherings postponed indefinitely, we are assessing the situation and how to proceed.

Title: **Improving Food Safety Practices for Under-served Asian Refugee Farmers**

Author(s): **Kelly Owensby**, Transplanting Traditions Community Farm
Chloe Forkner Johnson, Carolina Farm Stewardship Association
Ben Chapman, North Carolina State University

The Transplanting Traditions Community Farm (TTCF) is a non-profit organization in the Piedmont region of North Carolina that offers a farm incubator and robust farm training program serving 100% limited resource and socially disadvantaged refugee farmers from Burma.

TTCF has lacked the resources and capacity to fully address the evolving food safety needs of refugee farmers' businesses and Food Safety requirements informed by FSMA. TTCF and participating farmers are also experiencing significant growth in both production and marketing, presenting new challenges and gaps in current food safety knowledge, planning, and practice.

Additionally, TTCF Asian American farmers leverage their traditional agricultural skills and experience to grow an expansive diversity of vegetable products, including numerous specialty Asian crops. These crops require specific preharvest and postharvest handling to ensure appropriate washing, storing and packaging. Addressing the specific pre and post harvest food safety needs of a diversity of crops has been increasingly complicated and farmers' current knowledge and resources has been insufficient.

Egg production has also become an important income stream for TTCF farmers. However, a pastured poultry operation integrated into a diversified specialty crop farm presents unique challenges to food safety

Like most incubator farms, all TTCF farmers share infrastructure including a large wash and pack space for postharvest handling and two large walk in coolers. However, TTCF does not have a shared infrastructure food safety protocol or shared culture of practice creating contamination risk within shared infrastructure

TTCF will accomplish these goals by implementing the following major objectives
1) Analyze the food safety risks encountered by socially disadvantaged refugee farmers on the TTCF incubator, including those posed by beginning, intermediate, and advanced refugee farmers all sharing postharvest handling infrastructure at the incubator farm; 2) Address food safety risks presented by the recent rapid growth of TTCF market outlets such as CSA and farmers' markets including ensuring appropriate pre and postharvest handling practices for the 58 specialty crops grown for these markets; 3) Identify and address the specific food safety risks posed by a pastured poultry system integrated with vegetable production and develop preventative protocols and food safety risk management practices informed by FSMA regulations; 4) Help refugee farmers begin utilizing wholesale market outlets by identifying and addressing food safety requirements for accessing larger wholesale markets; 5) Analyze the food safety risks of agritourism activities to ensure food safety planning includes visitor

compliance; 6) Develop a comprehensive food safety plan and culturally and linguistically appropriate training materials, record keeping tools, and internal auditing plans that are aligned with FSMA standards and ensure socially disadvantaged refugee farmers are able to understand and strengthen their food safety practices; 7) Deliver training and technical assistance to all refugee farmers at the TTCF incubator farm to help them address gaps in knowledge, improve their food safety standards, and leverage these improvements to access new markets.

Title: **Food Safety for Qualified Exempt Food Producers to Build Economic Viability Under the Food Safety Modernization Act**

Author(s): **Olga I. Padilla-Zakour**, Cornell University
Cynthia James, Cornell University
Bruno Xaver, Cornell University
Shannon Prozeller, Cornell University

Background and Project Importance

Cornell Food Venture Center (CFVC) assists hundreds of small food processors annually with food safety and regulatory compliance for their products. There is significant cultural diversity among small food processors in the Finger Lakes region of New York. Each community requires different outreach and delivery strategies to effectively offer applicable trainings.

Objective or Purpose

Our goal was to reach regional "Qualified Facilities" from underserved populations and share FSMA compliance requirements. The primary target audiences were NY manufacturers in urban Rochester and in regional rural Amish/Mennonite communities with limited access to online resources.

Methods

Building partnerships with Cornell Cooperative Extension offices and a new Rochester-based incubator kitchen was essential to successfully reach target audiences. CFVC developed and conducted full-day, in-person intensive trainings at two different locations accessible to each target audience. The 5-Module training included: Food Safety and Microbiology; Safe Food Preservation; Reduced Oxygen Packaging; cGMPs; and FSMA Regulations for Small Food Processors. Each participant received a book that included all slide decks, glossary, production record templates, pathogen reference table, and regulatory forms.

Results

Course evaluation feedback confirmed overwhelmingly that the training met participant expectations and that they had gained a much better understanding of applicable regulations. Participants also found the written reference material extremely helpful to support their one-day intensive learning experience.

Learning evaluations showed an overall increase in knowledge. Responses to individual questions varied but one example showed a 67% increased understanding about allergen food safety hazards; another showed a 40% increased understanding about income requirements that define a qualified exempt facility.

Significance or Key Outcomes

CFVC trained a total of 95 small food processors and Extension Educators between October 2019 – January 2020 through three separate full-day trainings on food safety topics and regulatory compliance, highlighting FSMA's Preventive Controls for Human Foods Rule.

Title: **Supporting Underserved CA Leafy-Green Producers' FSMA Compliance, through Interdisciplinary Food Safety, Communication and Marketing Training**

Author(s): **Jeta Rudi Polloshka**, California Polytechnic State University
Karen J. Cannon, California Polytechnic State University
Amanda A. Lathrop, California Polytechnic State University
Erin Krier, Allan Hancock College

Using an interdisciplinary approach, this collaborative project seeks to train socially-disadvantaged farmers in California's Santa Maria valley in an essential area - FSMA regulation compliance. Given recent prominent food safety outbreaks in romaine lettuce and the importance of the leafy greens' industry to California, we will work specifically with operators of small and very small leafy greens' farms in the Santa Maria valley. In this space, we aim to work with operators of Hispanic origin, given documented challenges they face in developing regulation compliance due to barriers in language, education, and other resources. Our project includes three objectives: (a) to provide PSA grower training to approximately 40 farmers, (b) to provide individually-tailored comprehensive food safety planning training to 15 leafy greens' operations via field visits, and (c) to train Allan Hancock College and Cal Poly students in an interdisciplinary approach to food safety, thereby increasing capacities of future food safety experts in the state. Field visits to participating farmers will include (i) Food safety plan development and review; (ii) Marketing and data collection workshop outlining the business aspect of food safety regulation compliance; and (iii) Crisis communication plan development and review. This project benefits not only our target population and consumers of leafy greens, but also positively impacts the wider leafy greens industry, as these items function in a non-branded food product space where the actions of one operator often have spill-over effects to the entire industry. Given a successful history of collaborating with industry, Cal Poly and Allan Hancock College are in a uniquely strong position to successfully deliver these project objectives. This project is in-line with FSOP objectives as it develops and delivers FSMA-related food safety training to socially disadvantaged farmers. Project materials, methods utilized, and data collected will be shared with FSOP Regional Centers and USDA NIFA in order to contribute valuable knowledge to future projects.

Title: **The Southern Regional Center for Food Safety Training, Outreach and Technical Assistance Continuation, and Lead Regional Coordination Center**

Author(s): Travis Chapin, University of Florida
Michelle Danyluk, University of Florida
Renée Goodrich Schneider, University of Florida
Amy Harder, University of Florida
Keith Schneider, University of Florida

Compliance with the Food Safety Modernization Act's Produce Safety Rule (PSR) and Preventive Controls for Human Foods Rule (PCHF) requires training, outreach, and technical assistance for owners and operators of small and medium-sized farms, beginning farmers, socially disadvantaged farmers, small food processors, and small fruit and vegetable wholesale merchants. The Southern Regional Center for FSMA Training (SC) is a consortium of 22 institutions aimed at enhancing produce safety in 13 southern states and 2 territories through a variety of educational means, including conducting and evaluating standardized courses (Produce Safety Alliance (PSA) and Food Safety Preventive Controls Alliance (FSPCA) Preventive Controls Qualified Individual (PCQI)) targeting the PSR and PCHF. Validated pre/post-tests were given at PSA and FSPCA PCQI courses to assess short-term knowledge gains from September 2018-July 2020. Post-test scores at FSPCA PCQI trainings (n=108) were significantly higher than pre-test scores ($T = -6.950$, $p < 0.05$), indicating a significant increase in knowledge after participation in the training. Of seven practices included in the FSPCA PCQI behavior change surveys (n=22) the most frequent behavior change was implementation of new food safety plans (55%). Post-test scores at PSA trainings (n=2,234) were significantly higher than pre-test scores ($T = -55.90$, $p < 0.05$), indicating a significant increase in knowledge. Of 13 practices included in the PSA surveys (n=104) the most frequent behavior change was creation or modification of food safety record-keeping systems (49%). Additionally, members of the SC have held, in collaboration with southern state departments of agriculture, two Southern Region Integrated Produce Safety conferences and are in the process of planning a virtual conference for fall 2020. In collaboration with the PSA, the SC planned and held two PSA Advanced Trainings (n=51). The Lead Regional Coordination Center operates to promote produce safety, communication, and collaboration between the four regional centers at a national level.

Title: **Food Safety Education for Korean Speaking Specialty Fruit Growers in California**

Author(s): **Luis Sierra**, California Center for Cooperative Development

The Korean speaking farming communities in California are concentrated in the Lucerne Valley of San Bernardino County. The long-term goal of this food safety outreach project is to support a culture of informed food safety decision making, consistent compliance, and a more complete understanding of the Food Safety Modernization Act's (FSMA) Produce Safety Rule in the small-scale, mostly organic, and Korean-speaking farm communities in California. The specific objectives of this project are to increase small, organic, and Korean-speaking grower (i) knowledge of FSMA Produce Safety Rule requirements; (ii) compliance with the FSMA Produce Safety Rule requirement outlined in § 112.22©; and (iii) understanding and implementation of the Good Agricultural Practices (GAPs) outlined in FSMA. The project began in October 2019 and has focused on translating the PSA curriculum and supplemental materials included in PSA binders. One additional training on exemptions and exclusions has been planned and bilingual outreach materials are planned to be used in PSA trainings scheduled for 2020. The outreach through mail program was canceled due to the COVID-19 Shelter-in-Place order and we are waiting to set new dates for training once reductions in social distancing measures occurs. Two additional PSA trainings and three GAP-related workshops are planned for 2021.

Title: **Food Safety Bites: A Weekly Food Safety Podcast**

Author(s): **Erin Silva**, University of Wisconsin-Madison
Harriet Behar, University of Wisconsin-Madison

This one-year pilot project will draw on the food safety expertise and podcast production experience of Harriet Behar and Annalisa Hultberg to produce a series of weekly food safety podcasts for fresh produce farmers. The 36 podcasts will address topics of interest identified by farmers and the North Central Region Center for FSMA Training, Extension and Technical Assistance. The podcasts will provide food safety information in small doses during the growing season, in a format that can be consumed while also engaging in other tasks. Listeners to other vegetable farming related podcasts have indicated that they listen while washing produce, driving to farmers market, operating the tractor, and during other farming activities; because listeners don't have to "make time" to consume the media, they are more likely to listen to and absorb the information, as well as share with their workers. Podcasts will be available for free online and each episode will be accompanied by full transcripts as well as a one-page worksheet summarizing the relevant and technical information. As an Extension Specialist at UW-Madison, Project Director Erin Silva will ensure that podcast topics, content and dissemination align with its activities and the needs of farmers in the region. We anticipate that this pilot project will provide a completely new format for receiving and sharing food safety and FSMA information with the farming community that synergizes with methods like winter workshops and on-farm, hands-on experiences.

Title: **A Primer to the Produce Safety Rule for Small and Very Small Farms in Washington State**

Author(s): **Stephanie A. Smith**, Washington State University
Scott Parrish, Washington State University
Susie Craig, Washington State University
Faith Critzer, Washington State University

Our studies have shown that small growers in Washington State are struggling to understand the basic requirements of the FSMA Produce Safety Rule (PSR). Some of the barriers that have been identified include: 1) they do not have a firm grasp of food safety because their markets are not requiring this information; 2) they do not understand the context of PSR and how it may apply to their operation; and 3) a lack understanding that inspections will be performed on their farm to assure they are meeting the minimum requirements set forth in (PSR) if covered. To address these issues, we have developed educational training content in English and will soon translate the materials into Spanish. The content provides participants introductory knowledge of third-party audit systems, provides training on which farms/facilities are covered under the FSMA PSR, and reviews the basic regulations under the rule. The training will be delivered both on-line and in-person over the next fall and winter. Additional content is being developed to train WSU Extension faculty and staff to deliver the content and provide expanded coverage of training across the State. Ultimately, this project will provide small growers with the knowledge needed to understand PSR, and what steps they will need to take to ensure delivery of fresh produce to their customers and begin to take steps toward compliance with the PSR. Moreover, this will enable growers to expand their markets through increased compliance with food safety programs.

Title: **Food Safety Management and Document Development for PCHF Rule Qualified Exemption-eligible Food Facilities**

Authors: **Abby Snyder**, Cornell University
 Olga Padilla-Zakour, Cornell University
 Shiyu Cai, Cornell University
 Bruno Xavier, Cornell University

The Preventive Controls for Human Food (PCHF) Rule of FSMA represents the first major update of U.S. food safety programs since the Food, Drug, and Cosmetic Act was signed in 1938. While small and very small manufacturers are eligible for qualified exemptions from parts of the rule, notably the need for a formal Hazard Analysis and Preventive Control Plan in Subparts C and G, these facilities are still required to follow the current Good Manufacturing Practices (GMPs) as well as FSMA-specific requirements for record keeping and training of personnel training in other Subparts of the PCHF Rule. Attestation that shows a manufacturer to be qualified for exemption is necessary, including documentation demonstrating the company to be a small or very small business following the economic parameters which defines qualified exempt facilities. The goal of this project is to increase FSMA preparedness among qualified exemption-eligible food processors through a national training program that includes 1) the development of a generalizable curriculum and exercise templates, 2) the offering of training sessions and guidance to food processors in collaboration with other state extension specialists, and 3) the development of an online training course to further facilitate remote access to training. The project was initiated in 2019 and the development of curriculum and training session offerings have included a pivot to remote training through various webinar formats and small group Q&A sessions as of March 2020 as a consequence of the COVID-19 pandemic.

Title: **FSMA Document Development and Management Training for Small-scale Processors of Fermented and Acidified foods**

Authors: **Abby Snyder**, Cornell University
Erin DiCaprio, UC Davis
Ahmed Yousef, The Ohio State University

The Preventive Controls for Human Food (PCHF) Rule of FSMA represents the first major update of U.S. food safety programs since the Food, Drug, and Cosmetic Act was signed in 1938. While small and very small manufacturers are eligible for qualified exemptions from parts of the rule, notably the need for a formal Hazard Analysis and Preventive Control Plan in Subparts C and G, these facilities are still required to follow the current Good Manufacturing Practices (GMPs) as well as FSMA-specific requirements for record keeping and training of personnel training in other Subparts of the PCHF Rule. Attestation that shows a manufacturer to be qualified for exemption is necessary, including documentation demonstrating the company to be a small or very small business following the economic parameters which defines qualified exempt facilities. The goal of this project is to increase FSMA preparedness among fermented and acidified food processors by delivering targeted, customized training and associated resources necessary in document development and management. A full-day training curriculum was developed and has been offered six times to more than 200 processors of sauerkraut, lactofermented pickles, kimchi, kombucha, vinegar, hard cider, and wine. Of these, 80% reported having never previously attended a FSMA-PCQI or BPCS course. Additionally, 68% had not participated in a GMP training prior to this class. The majority (85%) found the course very useful and the remainder found the course somewhat useful. Participants self-reported an increase in knowledge and their post-test knowledge assessment scores increased by 41% compared to pre-tests.

Title: **Expanded Refugee and Immigrant Food Safety Outreach Project in Sacramento**

Author(s): **Eric Spring**, International Rescue Committee, Sacramento

This project will expand food safety education and training to refugee and immigrant farmers in the Sacramento region, with the ultimate goal of supporting these farmers in adopting food safety best-practices and reducing the overall risk of food-borne illness outbreaks originating from their farms.

Refugee and immigrant farmers understand that they need to comply with state and federal food-safety regulations such as the Food Safety Modernization Act (FSMA) in order to market their products to the public. However, they are often not able to access the full range of food safety related resources available to other farmers. This is due to language and literacy barriers, minimal financial resources, lack of access to appropriate trainers and training events, and incomplete knowledge or understanding of the United States' food system regulations. The IRC will complete three sets of food safety training curricula each catered towards a different audience of marginalized farmers, including Nepali, Arabic and Lu-Mien speakers.

The curriculum will include videos, visual aids and other forms of content that are accessible to all levels of learners to teach them about the food safety principles and regulations that apply to them. The IRC will then support these farmers to utilize these food safety best practices by creating plans to monitor and track their adoption of these practices and provide regular visits and meetings to foster the use of these practices on their farms.

Title: Food Safety Education and Outreach Program for Small and Socially-Disadvantaged Farmers

Author(s): Barrett Vaughan, Tuskegee University

This Community Outreach Project developed and piloted produce food safety Good Agricultural Practices (GAP) and Food Safety Modernization Act (FSMA) compliance education and outreach materials suitable for small and socially-disadvantaged farmers. The objectives were to: (1) survey and adapt produce food safety GAP and FSMA compliance education and outreach materials suitable for the targeted farmers for large-group trainings and on-farm demonstrations; provide produce food safety GAP and FSMA compliance in-service, "Train-the-Trainer" training to GAP-certified training farmers and demonstration leader farmers, and; (3) pilot the adapted produce food safety GAP and FSMA compliance education and outreach materials at large group trainings and on-farm demonstrations with the targeted farmers. Outreach materials from several Extension units nationwide were catalogued and adapted for use with the targeted farmers. A group of the targeted farmers, along with staff, completed the PSA Trainer Course during several offerings in Alabama and Mississippi. The key outcomes of the project were more small and socially-disadvantaged farmers who were not only able to take advantage of enhanced marketing opportunities, but also be a model for other farmers, and the creation of materials that would broaden the audience of the existing food safety outreach offerings.

Title: **Expanding Farmer Education to Create a Culture of Food Safety in the Chesapeake Region**

Author(s): **Tracy Ward**, Easton Economic Development Corporation
Lindsay Gilmour, Organic Planet LLC

By introducing GAP and food safety risk reduction as foundational components of good farming and postharvest practices, the project seeks to change the predominate mindset among very small, socially disadvantaged and beginner specialty crop producers that food safety regulations and certification are optional and burdensome steps only necessary for larger farms to pass inspection or an audit. A culture of food safety means farmers understand that minimized risk and food quality are intertwined and that FSMA compliance or even GAP certification are not only reasonable and attainable, but beneficial for farm operations. Helping farmers recognize the necessity of, and embrace the business case for, food safety reduces fear, skepticism and/or dismissal of the topic, and encourages a positive culture around food safety. Food safety risk assessment and protocols should be a lens through which farm infrastructure, personnel training, and operations are viewed, as a producer's business develops and expands.

The project is advancing this goal by providing four levels of food safety education and training: foundational and general education on good agricultural practices via peer-to-peer and expert-led intensives and seminars for 300 small and very small Chesapeake producers, with a focus on socially disadvantaged and beginner farmers; in-depth information on FSMA compliance and produce safety risk assessment via workshops, remote support and on-farm experiential education that supplement federally-mandated classroom training to prepare 30 producers to comply with produce safety laws; and one-on-one coaching for 10 producers with hands-on, personalized information to develop a comprehensive food safety program for their farms and become GAP Audit Ready so they can serve wholesale markets. We are also providing training to four community-based food safety educators who provide on-farm, culturally appropriate coaching, tools and solutions to very small and socially disadvantaged producers in their communities.

Title: **Experiential Learning Opportunities for Limited Resource Growers through Mobile Farm Innovation in Mississippi, Alabama, and Georgia**

Author(s): **Kristin Woods**, Auburn University
Andrew Williams, The United Christian Community Association
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The overarching goal of the project Experiential Learning Opportunities for Limited Resource Growers through Mobile Farm Innovation in Mississippi, Alabama, and Georgia is to meet the critical challenge to farm viability faced by socially disadvantaged, limited resource, minority growers in the region who are trying to balance food safety and conservation concerns. The customized food safety training proposed will build on the body of food safety resources previously developed but will meet the needs of the growers in this region by focusing on experiential learning and face-to-face technological support. With the growers' long-term food safety, conservation, and financial viability in mind, the objectives of the project are to develop three Mobile Farm Innovation Units equipped with multiple experiential, visual, and technological training aides, develop curriculum to accompany the Innovation Units, provide outreach to socially disadvantaged, limited resource, and minority growers in Mississippi, Alabama, and Georgia, and evaluate the effectiveness of the program. The curriculum to accompany the Innovation Units includes the development of a comprehensive module on Whole Farm Planning: balancing food safety and conservation concerns, the development of interactive activities, demonstrations, and presentations focusing on food safety, and computer literacy training focused on improving grower access to already existing technology based food safety materials.

Title: **Bridging the GAPs: Approaches for Treating Preharvest Agricultural Water On-Farm**

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Pre-harvest water treatment is allowed by the Produce Safety Rule and has recently been required by some buyers or marketing agreements for specific commodities, such as leafy greens. A collaboration between the University of Tennessee (A. Wszelaki and J. Buchanan), University of Florida (M. Danyluk, T. Chapin, and A. Harder), Virginia Tech (L. Strawn), North Carolina State University (C. Gunter), Washington State University (F. Critzer), and New Mexico State University (J. Gleason and B. Chamberlin) led to the creation of a one-day curriculum consisting of four modules with hands-on activities, and other training aids such as four animated videos and an interactive test strip lab iPad app to reinforce key concepts (available at irrigation.nmsu.edu). After piloting the curriculum with key stakeholders, a roll-out of a train-the-trainer in January of 2020 has resulted in 28 new trainers from 13 different states and territories. Participants in the train-the-trainer course increased their knowledge by 23.8% based upon results of a pre/post-test. One hundred twenty-five growers participated in growers-training held in the Southeast between January and March of 2020. Amongst these participants, knowledge of approaches for treating agricultural water increased by 25.8%. In course participant surveys (both TTT and grower trainings) 92-100% of participants were satisfied with the course content and delivery from the training team. Forty-nine percent of participants rated the training as excellent, with the remaining 51% rating the training as good or very good (mean rating of 4.22 on a 5-point Likert scale). The team plans to continue work to deliver TTT course in order to expand delivery across the United States, as well continued delivery of grower trainings within our states. C. Gunter has also partnered with eXtension to create a complimentary e-fieldbook based upon the curriculum content.

Title: Collaborative Food Safety Education Program for Louisiana Retail/Manufacturing Crossover Businesses

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New trends are driving food businesses to cross over from retail to manufacturing, blurring the lines between industries. Spanning across both retail and manufacturing gives these businesses abundant opportunities and a strong potential for growth, but can make navigating food regulations more complex. These crossovers also make it difficult for local regulatory agencies.

We propose a collaborative education project aimed at assisting existing crossover businesses or businesses who are considering crossing over between retail and manufacturing. We will help them identify applicable food safety regulations and provide customized educational modules to that will allow them to fulfill regulatory requirements. Specific objectives include:

- 1) Identify the detailed needs for regulatory and crossover food businesses in food safety regulation training
- 2) Organize and evaluate the existing training materials and identify the gaps.
- 3) Develop a series of eLearning modules and train-the-trainer curriculum for crossover food businesses and LDH sanitarians, respectively.
- 4) Conduct the train-the-trainer workshops for LDH sanitarians and implement the eLearning modules for crossover food businesses.

The strategic collaboration between Louisiana State University Agricultural Center (LSU AgCenter) and the Louisiana Department of Health (LDH) is critical for achieving the above goals. The educational modules developed by the LSU AgCenter will be implemented through LDH sanitarians. The impact of the proposed project is expected reach statewide.