



**Food Safety
Outreach Program**

National Project Directors' Meeting

PROGRAM & ABSTRACTS

May 31-June 1, 2023 | Tampa, FL
conference.ifas.ufl.edu/fsop





National Project Directors' Meeting

May 31 - June 1, 2023 | Tampa, Florida

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Wi-Fi Information

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Name Badge

Your name badge serves as your admission to all networking functions, so be sure to wear it throughout the meeting.





Food Safety Outreach Program National Project Directors' Meeting

May 31 – June 1, 2023 | Tampa, Florida

Welcome to the USDA NIFA National Food Safety Outreach Program National Project Directors' Meeting. We are delighted to have all of you here with us today. 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 Regional Center to Enhance Food Safety (WRCFS)) will host FSOP grant awardees from around the country as they discuss their accomplishments and success stories. As National Project Directors, you play a critical role in ongoing research and outreach activities, ensuring the safety and quality of our nation's food supply. Your leadership, dedication, and expertise are essential to the success of this program. We will have the opportunity to share knowledge, exchange ideas, and discuss the latest food safety research and outreach developments. We will hear from experts in the field, learn about best practices, and explore new strategies for improving food safety education and outreach.

Additionally, each of the four regional centers will provide an update on regional activities and projects. We will hear from USDA NIFA representatives who will give us an update on the current FSOP program and what we might expect in the future. We hope you will take some time to review this book of abstracts we've put together and reach out to your colleagues to share experiences and ideas. We'll hear from awardees from the Northeast, Western, and North Central Regional Centers on Wednesday and participate in breakout sessions. We'll get updates from associations and the Southern Regional Center to round out our meeting on Thursday. Once again, welcome to the USDA NIFA National Food Safety Outreach Program National Project Directors' Meeting. We look forward to a successful and rewarding event. ***Thank you for joining!***

This work is supported in part by USDA NIFA grant no. 2018-70020-28930 and 2021-70020-35740. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Planning Committee

Lead Regional Coordination Center / Southern Regional Center

Keith R. Schneider, *Professor*, University of Florida

Renée Goodrich Schneider, *Professor*, University of Florida

Michelle D. Danyluk, *Professor*, University of Florida

Taylor Langford, *State Specialized Extension Agent*, University of Florida

Matt Benge, *Evaluator/Extension Assistant Professor*, University of Florida

Peggy Geren, *Extension Program Specialist*, University of Florida

USDA-NIFA

Jodi Williams, *National Program Leader*, USDA Institute of Food Safety and Nutrition

Courtenay Simmons, *National Program Leader*, USDA Institute of Youth, Family, and Community

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Angela Shaw, *Professor*, Texas Tech University

Arlene Enderton, *Evaluator/Program Specialist*, Iowa State University

Northeast Regional Center

Chris Callahan, *Extension Associate Professor*, University of Vermont

Elizabeth Newbold, *Assistant Director NECAFS*, University of Vermont

Western Regional Center

Jovana Kovacevic, *Associate Professor*, Oregon State University

Stephanie Brown, *WRCEFS Coordinator*, Oregon State University

Agenda-at-a-Glance

Wednesday May 31, 2023	
7:30am-8:30am	Morning Refreshments
8:30am-9:00am	Welcome and Overview
9:05am-10:45am	Northeast Center to Advance Food Safety
10:45am-11:00am	Break with Refreshments
11:00am-12:00pm	Western Regional Center to Enhance Food Safety
12:00pm-1:30pm	Group Luncheon
1:30pm-3:00pm	North Central Region
3:00pm-3:15pm	Break with Refreshments
3:15pm-5:00pm	Breakout Sessions
5:00pm-5:15pm	Break
5:15pm-6:15pm	Poster Session and Reception
Thursday June 1, 2023	
7:30am-8:30am	Morning Refreshments
8:30am-9:20am	Welcome and Association Updates
9:20am-10:15am	Southern Center for FSMA Training
10:15am-10:30am	Break and Poster Breakdown
10:30am-11:30am	Southern Center for FSMA Training
11:45am	Meeting Adjourns
12:00pm	Grab and Go Lunch

Notes

Detailed Agenda

Wednesday May 31, 2023			
Room: Snowy Egret			
7:30am	Morning Refreshments (<i>Sandhill Crane Room</i>)		
8:30am	Welcome and Overview	Keith Schneider	University of Florida, LRCC
8:35am	CONTACT Grant Update	Alexis Hamilton	Virginia Tech
8:45am	Evaluation Update	Matt Benge	University of Florida
8:55am	Updates from USDA-NIFA	Jodi Williams	USDA-NIFA
Northeast Center to Advance Food Safety			
Session Moderator: Elizabeth Newbold			
9:05am	Regional Center Update – NECAFS	Elizabeth Newbold	University of Vermont
9:15am	Program (SCPP) – The Development of an Education Sanitation Program for Small Processors	Amanda Kinchla	University of Massachusetts
9:30am	Expanding the Capacity of Community-based Produce Safety Educators to Serve Hard-to-reach Farmers in the Mid-atlantic	Lindsay Gilmour & Aleya Fraser	Organic Planet LLC
9:45am	Jumpstart to Farm Food Safety – Farm Food Safety Planning for Small and Medium-sized Farms	Rob Machado	University of Maine
10:00am	Engaging Qualified Exempt SMPs to Comply with FSMA Preventive Controls for Human Food	Annie Fitzgerald	University of Vermont
10:15am	Summarizing and Extending Information from Existing Produce Safety Research	Anna Loewald	University of Vermont
10:30am	Understanding and Addressing Needs for On-farm Produce Safety Education in Hydroponics and Aquaponics	Christopher Callahan	University of Vermont
10:45am	Break with Refreshments (<i>Sandhill Crane Room</i>)		

Notes

Wednesday | May 31, 2023 (continued)

Room: Snowy Egret

Western Regional Center to Enhance Food Safety

Session Moderator: Stephanie Brown

11:00am	Regional Center Update – WRCEFS	Stephanie Brown	Oregon State University
11:15am	Hybrid Training for Quality Assurance and Food Safety Programs Designed for Small-scale Food Processors and Distributors	Erin DiCaprio	University of California at Davis
11:30am	Enhancing Food Safety Capacity of Western Elderberry Producers: Best Practices for Harvest and Processing	Erin DiCaprio	University of California at Davis
11:45am	Increasing Accessibility of Food Safety Resources to Tribal Growers in Arizona to Advance Resilience of Native Nations	Shujuan (Lucy) Li	University of Arizona

12:00pm Lunch (*Starling Room on the 14th floor*)

North Central Region

Session Moderator: Ellen Johnsen

1:30pm	Regional Center Update – NCR	Ellen Johnsen	Iowa State University
1:40pm	Food Safety Training for Small Businesses Engaged in Canning	Kantha Channaiah	University of Missouri
1:50pm	Customizing Current Good Manufacturing Practices Training and Education for Small and Very Small Food Facilities across the U.S.	Byron Chaves	University of Nebraska
2:00pm	Development of a Community Culinary Incubator to Improve Food Safety and Value-added Opportunities for Small Farmers, Producers, Processors, and Potential Entrepreneurs	Cindy Borgwordt	Lincoln University
2:10pm	Assisting Small and Medium-sized Farmers Through Cross-state Collaboration	Billy McCarthy	National Farmers Union/Local Food Safety Collaborative
2:20pm	Water Quality and the FSMA PSR: Developing Risk Assessment and Educational Tools for Farmers and Laboratories in the Upper Midwest	Phil Tocco	Michigan State University
2:30pm	Implementation of Food Safety and Quality Principles to Address Critical Issues in the Development of Food Safety Practices	Shannon Coleman	Iowa State University
2:40pm	Strengthening FSMA Agricultural Water Outreach and Education for Produce Growers in Kansas and Missouri	Londa Nwadike (Recorded)	Kansas State University and University of Missouri
3:00pm	Break with Refreshments (<i>Sandhill Crane Room</i>)		

Wednesday | May 31, 2023 (continued)

Room: Snowy Egret

3:15pm	Instructions for Breakout Groups	Chris Callahan	University of Vermont
3:20pm	Breakout Groups (<i>Multiple Rooms</i>)	Facilitators	
3:20pm	Breakout 1	Stephanie Brown	
	Breakout 2	Ellen Johnsen	
	Breakout 3	Renée Schneider	
	Breakout 4	Elizabeth Newbold	
4:20pm	Breakout Report Out		
5:00pm	Break		
5:15pm	Poster Session and Reception (<i>Sandhill Crane Room</i>)		
6:15pm	Dinner on your own		

Thursday | June 1, 2023

Room: Snowy Egret

7:30am	Morning Refreshments (<i>Sandhill Crane Room</i>)		
8:30am	Welcome and Overview	Keith Schneider	University of Florida
8:40am	Updates from Associations		
8:40am	Produce Safety Alliance	Yulie Meneses	PSA
8:50am	Local Food Safety Collaborative	Billy McCarthy	LFSC
9:00am	Food Safety Preventive Controls Alliance	Jason Wan	FSPCA
9:10am	Indigenous Food and Agriculture Initiative	Will Seely (<i>Recorded</i>)	IFAI
Southern Center for FSMA Training			
<i>Session Moderator: Michelle Danyluk</i>			
9:20am	Regional Center Update – Southern Center	Michelle Danyluk	University of Florida
9:30am	Enhancing Food Safety Outreach to Underrepresented Communities Through Food Microbiology and Soil Amendments Related Hands-on Workshops	Armitra Davis-Jackson	Alabama A&M University
9:45am	Development and Implementation of Innovative Food Safety Training Tools for the Production and Distribution of Microgreens	Kristen Gibson	University of Arkansas
10:00am	Increasing Accessibility of Food Safety Education Through Remote Learning Opportunities	Taylor O'Bannon	University of Florida
10:15am	Break and Poster Breakdown (<i>Sandhill Crane Room</i>)		

Abstract Compilation

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Title: **Develop and Deliver On-farm Biological Soil Amendment of Animal Origin Course Integrated with Hands-on Training**

Author(s): **Achyut Adhikari**, Louisiana State University AgCenter
Kathryn Fontenot, Louisiana State University AgCenter
Karuna Kharel, University of Florida

Biological soil amendments are the materials that are animal or plant origin and are used in agricultural farms to improve the chemical and physical properties of the soil. Animal origin includes fecal or non-fecal animal byproducts that may harbor human pathogens, including *E. coli* O157:H7, *Listeria monocytogenes* and *Salmonella* spp. It is essential to have a curriculum on biological soil amendment in the understandable form and at least a basic level training on a regular basis at the grower level. The objective of this project is to develop and deliver BSAAO course integrated with hands-on training. A curriculum for “Composting for Food Safety” workshop and a composting demonstration site equipped with small and medium size composting process/equipments was developed at the LSU AgCenter Botanical Gardens in Baton Rouge. Three BSAAO courses (one remote and two in person) was completed with >100 participants including growers, state regulators, extension agents and students. Among the participants >90% indicated their knowledge on BSAAO requirement and >95 indicated their knowledge on biology of compost and composting process increased to a high or very high level. A series of fact sheets on composting and food safety (n=13) and videos (n=6) on wormcasting, turned pile and aerated static pile compost and determining compost quality was developed and posted at the LSU AgCenter composting webpage. Social media platforms (Facebook, Twitter, and Instagram) were actively used to share food safety educational materials with our stakeholders that gained 67381 engagement and reached 629,744 people in one year. The workshop and educational materials promoted a greater understanding of the safe use of BSAAO to minimize the risk of contamination and help prevent adulteration with fresh produce on covered farms in Subpart F of the Produce Safety Rule.

Title: **Multi-modal Dairy Food Safety Plan Education to Support Small and Medium Dairy Producers**

Author(s): **Samuel Alcaine**, Cornell University
Jovana Kovacevic, Oregon State University
Joy Waite-Cusic, Oregon State University
Stephanie Brown, Oregon State University
Clint Stevenson, North Carolina State University

Consumer interest in artisanal dairy products, like fluid milk, cheese ice cream, and yogurt, continues to increase across the country. While this demand has led to the growth of large number of small and medium size dairy businesses, many are resource limited and may lack the capital and technical expertise to implement robust food safety programs. Foodborne outbreaks continue to be associated with some artisan dairy products, and this highlights the need to ensure that effective and accessible food safety education programs are available. Many programs, like the FSPCA Preventive Controls for Human Foods, provide a forum to understand regulations and the basic food safety plan concepts, but many small dairy producers find it challenging to develop and implement food safety plans compliant with the Food Safety Modernization Act (FSMA). Furthermore, due to the wide distribution of small dairy producers, access to classes is often limited by geography, time, and cost. We aim to build a multi-modal food safety plan education program that leverages synchronous and asynchronous content, in virtual and in-person platforms, to deliver an affordable, customizable, and engaging education wherever dairy producers reside. Specifically our goals are to: (i) provide online, asynchronous, dairy food safety plan training videos and materials; (ii) provide regular online, synchronous, dairy-relevant food safety office hours with food safety experts; (iii) build and maintain a Dairy Wiki; and (iv) link virtual dairy food safety to in-person communities via food safety training sessions that are held in conjunction with dairy conferences. This program has held 16 virtual office hours and run 4 in-person workshops in collaboration with conferences targeted to artisan cheesemakers and ice cream makers, with artisans continuing take the online modules. This program delivers an educational platform that supports small dairy producers in their efforts to develop and implement food safety plans and produce safe, wholesome products for US consumers.

Title: **Expanding Food Safety Training for Underserved Farmers in Greene County, MO**

Author(s): **Maile Auterson**, Springfield Community Gardens
G. Anneliese Kerr, Springfield Community Gardens

Springfield Community Gardens (SCG) is a 501(c)(3) non-profit organization based in Springfield, Missouri and founded in 2010 whose mission is to create community gardens that strengthen neighborhoods where people can grow healthy relationships, food and community.

This Community Outreach project will focus on meeting the food safety training needs of underserved, BIPOC and underserved farmers in urban and rural portions of Greene County, MO, as they initiate agricultural careers and enter production markets. SCG has made intentional efforts to reach out to immigrant populations in Greene County, MO including the Burmese, Hmong, Congolese, and newly arriving Afghan communities to incorporate culturally appropriate and linguistically accessible training and resources. While the opportunity to sell at farmers markets and other cultural markets in the region remains high, language and cultural barriers have often presented specific challenges when bringing food to market, specifically food safety and handling procedures that differ from their native countries. No other food safety training exists in the region for these populations.

MU Extension, a leader in regional agricultural training and resources, has successfully provided food safety and FSMA PSA training to socially disadvantaged and immigrant populations in the past (specifically the Hmong populations in rural areas of the State) and will be a primary partner for the proposed project. In partnership with MU Extension, this project will incorporate FSMA PSA training into the SCG farm incubator training model already in place, with a particular emphasis on the Burmese and Congolese populations, building the capacity of SCG to identify and implement appropriately customized food safety education and outreach programs to the BIPOC and Burmese and Congolese populations both during the grant timeframe and after the grant timeframe.

This project is anticipated to provide intense training to 20 target population farmers over the course of 24 months.

Title: Our Road to Safe and Healthy Food Podcast Project

Author(s): Ramkrishnan Balasubramanian, Florida Organic Growers
Juan Rodriguez, Florida Organic Growers
Keith Schneider, University of Florida
Michelle Danyluk, University of Florida

Food safety educational materials and learning opportunities to educate farmers about the Food Safety Modernization Act (FSMA) regulations may not always be readily accessible to all farmers. Many of the formal trainings that have been used to provide information to farmers about these food safety regulations are designed to be delivered as in-person workshops or short courses to farmers at specific times and locations during the year. The purpose of our project is to create and provide FSMA-related educational content that will be more accessible to new and beginning farmers and experienced farmers who live far from workshop sites, and who have often have difficulties or challenges preventing them from traveling far from their farms. FOG conducted focus groups and interviews with farmers in Florida to identify the relevant food safety topics that farmers believed they must understand better to comply with FSMA regulations. Their responses were used to design content for a podcast and webinar series to inform and educate them about these topics. A total of 10 podcast episodes and 5 webinars were created and made available through FOG's website. Topics covered in the series ranged from "Microbiology of Foodborne Pathogens and Their Effect on Food Safety" to "Farm Food Safety Audits" to "On Farm Readiness Reviews-Farmers and Inspector Perspectives." Webinars were supplemental to the podcast and served to expand on the information deemed useful to farmers. The live aspect of the webinars allowed for participant interaction, and the pre-recorded webinar format allowed for increased flexibility for knowledge sharing by experts. By providing an alternative option for farmers to learn about FSMA regulations, the Road to Safe and Healthy Food Podcast Project innovated how we may deliver useful information to farmers. These methods can positively influence how farmers obtain information about FSMA and make food safety-related decisions.

Title: **A Collaborative Multi-state Food Safety Outreach Program for Cottage Food and Home-based Food Producers with Limited Resources**

Author(s): **Pratik Banerjee**, University of Illinois, Urbana-Champaign
Ravi Jadeja, Oklahoma State University
Rodney Holcomb, Oklahoma State University

This proposal aims to develop a comprehensive food safety assistance program for home-based food producers and individuals involved in cottage food operations in Illinois and Oklahoma. To address the food safety educational needs of cottage food operators, in this project, we are proposing to develop education, extension, and outreach program infusing relevant aspects of the FDA Food Safety Modernization Act (FSMA) and Food Code. The specific objectives are:

Objective 1: Creation of customized training contents for home-based food producers/cottage food operations that include the following topics: a) Good Manufacturing Practices; b) food safety risk reduction; c) hazard control in food processing; d) labeling; e) allergens; f) food entrepreneurship; g) the legal aspects of cottage food operations.

Objective 2: Development of a digital training platform covering various aspects of cottage food and related laws (initially for Illinois and Oklahoma). This platform will include a dedicated Learning Management System (LMS) capable of delivering training content remotely and an electronic repository for storing information and dissemination.

Objective 3: Organize onsite training workshops and implement a stakeholder-driven education and outreach program for cottage food producers. Our target audience includes home-based food producers and cottage food operations. Our stakeholder-driven outreach program will include underserved groups and minorities (e.g., African American and Latino) involved in cottage food operations.

During the first year of the project, we co-sponsored the “Home-based Food Entrepreneur Virtual National Conference 2023” with our cottage food stakeholders group, which more than 460 participants attended. We offered a workshop titled “Understanding the Science & Safety Behind Non-Hazardous Food Products,” which was attended by 114 cottage food operators. We have also developed an online course on “Cottage Food Operator Training” for Illinois home-based food producers on “Learn @ Illinois Extension.” In 2023-2024 we will continue developing customized training content for home-based food producers/cottage food operations and offer onsite and online workshops.

Title: **Development of a Virtual Food Safety Education and Outreach Platform for Small and Very Small Farms in Illinois**

Author(s): **Pratik Banerjee**, University of Illinois, Urbana-Champaign
Goutam Banerjee, University of Illinois, Urbana-Champaign
Irshad M. Sulaiman, U.S. Food and Drug Administration

The entirety of the national food safety initiative cannot be assured without addressing the educational needs of small, specialized audiences who are an integral part of our food system. FDA's Food Safety Modernization Act (FSMA) Produce Safety Regulations (PSR) creates opportunities to train a diverse audience, including underserved growers. Moreover, in 2018, USDA aligned its Harmonized Good Agricultural Practices (HGAPs) audit with the FSMA-PSR requirements. The PSR is the prevailing federal regulation for covered farms in the US, while the GAPs audit programs are voluntary, buyer-driven market access tools for growers. The PSR and GAPs both emphasize implementing a food safety system using a risk-based approach to minimize microbial contamination of fresh fruits and vegetables. For small growers, who are typically not covered under the FSMA-PSR, the scopes of these two federal food safety programs (FSMA-PSR and GAPs) remain confusing, as noticed during our ongoing FSOP project (NIFA Grant # 2020-70020-33033) and a recent partnership with NASDA Foundation. Also, our community food safety outreach needs assessment revealed that most of these PSR-exempt growers in Illinois do not have a farm Food Safety Plan (FSP) or have no clear idea about it. To address these issues, we organized onsite community-based food safety boot camps providing an overview of FSMA-PSR and HGAPs and their key differences and developing a farm FSP. These workshops were organized during the summer of 2022 and spring of 2023. More than 40 small growers from different parts of Illinois (including 32 urban minority growers) participated. Our pre-workshop survey revealed that about 87% and 98% of the participants did not know the differences between PSR and GAPs, and did not have a farm FSP in place, respectively. All participants indicated their knowledge about the differences between PSR and GAPs increased to a high level. Almost all (>98%) attendees indicated that the workshops helped increase their likelihood of adopting an FSP in their operations.

Title: This Collaborative Education and Training Project Increases Food Safety Capabilities for Missouri Small Farmers and Processors, and their On-farm and Direct Service Providers with Food Safety Training

Author: Cindy Borgwordt, Lincoln University, Missouri

Attention to and enforcement of food safety compliance has greatly increased, especially since COVID-19. New and small food processors, growers, feed manufacturers, regulators/inspectors and farmers market/shared kitchen managers often lack the knowledge and capability to be food safety compliant. A major obstacle has been the cost of training and lack of needed support materials. No cost training offered includes: FSPCA – preventive controls alliance qualified individuals (PCQI) for Humans, & Animal Food, Hazard Analysis and Critical Control and Food Safety Manager. An on-farm food safety training will provide on-farm service providers with the necessary tools and hands-on experience.

NIFA desires small operators and socially disadvantaged to be able to successfully compete in FSOP grants. The development of FSOP grant writing training focusing on the small operations and socially disadvantaged will empower this group to be more competitive and successful by strengthening grant writing skills. The objective is to implement a trial in Missouri and then share nationwide.

Easy to understand supplement materials will help the audience understand required labeling, understanding the food code, making on farm food safety improvements, and how to improve grant writing skills.

Using a partnership model, working with the regulatory and food processing agencies and departments including the Missouri Enterprise Program, The Food Safety Dr., LLC and the Lincoln University Small Business Development Center, we will accomplish more with less.

This effort is in direct alignment with the Missouri Governor's Food Plan to increase food safety, increase opportunities for small producers and increase local value-added product in local communities. This effort addresses the Governor request to build Lincoln University as a food hub in the state plan.

The outcome will be increased food safety compliance, increased safe local food and empowered small operations and socially disadvantaged in competing for FSOP grant funds.

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: Cindy Borgwordt, Lincoln University, Missouri

The Culinary Incubator had major challenges upon initiation as COVID-19 hit. Since opening we have provided a facility for new entrepreneurs, provided food safety guidance, no cost training offered to Culinary Incubator members including: FSPCA – preventive controls alliance qualified individuals (PCQI) for Humans, & Animal Food, Better Process Control School, Hazard Analysis and Critical Control and Food Safety Manager, and business consulting for socially disadvantaged. Our partner is the Lincoln University Small Business Development Center.

Needed equipment and supplies, otherwise unaffordable and critical to their success, have been provided. We serve and consult over 30 clients with potential clients regularly inquiring. New locally made value-added products are contributing to client's livelihood. Due to the guidance and consultations provided a few clients learned their product would not be profitable – this is a success as otherwise they would have expended funds and efforts not recoverable. Three clients have received financial support by competing in the local Chamber "Pitch It" competitions. One client has successfully grown and gone on their own.

Active and potential clients receive hands on guidance and nurturing on safe food production, pricing, sourcing ingredients, food regulations, scaling up, making food, and how to be Food Safety Management Act rules compliant. We address labeling, packaging, transport, marketing, business plan development, budgeting, how to pass an inspection, record keeping, and more.

Clients include new food processing entrepreneurs, small farmers and growers, food trucks, concession stands, caterers, small farmers and growers and farmers market vendors. Local farmers markets have greatly increased their food safety compliance from ongoing advice.

This program has increased food safety compliance for new entrepreneurs, contributed to the local economy and provides the opportunity to prosper to socially disadvantaged food makers.

Title: Understanding and Addressing Needs for On-farm Produce Safety Education in Hydroponics and Aquaponics

Author(s): **Christopher Callahan**, University of Vermont
Sean Fogarty, University of Vermont
Elizabeth Newbold, University of Vermont
Elizabeth Bihn, Cornell University
Robson Machado, University of Maine
Sujata Sirsat, University of Houston

There are a growing number of small and medium-sized fresh produce operations utilizing hydroponic and aquaponic production methods. These systems and methods are relatively new and there is not widespread understanding of produce safety implications among growers and also not widespread understanding about the operations among produce safety educators and regulators. Evidence-based educational materials and programming about produce safety in these operations is lacking. The members of the Northeast Center to Advance Food Safety identified the need to coordinate efforts of those working in this area across regions to share information and resources and reduce the duplication of effort required to serve this audience and ultimately improve on-farm decision making and regulatory efficacy. To address this need, the project team will build a working group to coordinate multi-state hydroponic and aquaponic initiatives and clarify produce safety educational needs specific to hydroponics and aquaponics. We will develop educational programs and resources for the target audiences, coordinate the dissemination of educational outputs, and evaluate outcomes. As an additional result of working group activities, coordination of research efforts to address identified knowledge gaps will be facilitated.

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

Author(s): Adrian Card, Colorado State University Extension
Beth LaShell, Fort Lewis College
Martha Sullins, Colorado State University Extension
Harrison Topp, Rocky Mountain Farmers Union

The Colorado Produce Safety Collaborative is a multi-organizational team working throughout the state to produce a continuum of education around produce safety planning, practices, and regulation focused on specific regional needs. This educational approach is designed to 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. Although the project was designed based on evaluation data collected from 2015-2018, we adjusted our approach based on data collected in 2019 from Colorado produce growers who had participated in on-farm readiness reviews (OFRRs). We have determined that OFRRs more accurately demonstrate what growers have learned and can put into practice. Our project accomplishments to date include: 1) teaching introduction to produce safety courses delivered in ten locations to 120 growers; 2) understanding the Produce Rule by teaching 17 PSA Grower Training courses (ten in-person trainings held in eight locations and seven virtual trainings) to 275 individuals and delivering four regulatory update sessions (two webinars and two in-person sessions) to 55 growers; 3) providing nine webinars on new risk assessment and management tools, and providing ten advanced technical workshops on key produce safety risk management strategies. The team also produced one webinar and one workshop on preparing for a successful GAP audit. All of our resources are available on the coproducesafety.org website.

Although we convened an advisory board and formed a mentoring program, only one grower applied to be mentored and we received no applications for mentors. This signaled to us that Colorado growers are still more comfortable receiving information and acting on it individually but not yet as part of a community of growers supporting each other in building produce safety practices. In August 2022, we requested a one year no cost extension to continue our grant work.

Title: Food Safety by Design: Adding Value, Ensuring Safety of Food Products Produced by Small Processors

Author(s): Lakshmikantha Channaiah, University of Missouri
Barbara Ingham, University of Wisconsin-Madison
Kelly Getty, Kansas State University
Londa Nwadike, Kansas State University and University of Missouri
Karen Blakeslee, Kansas State University

This multi-state collaborative research project will develop and implement a robust food safety awareness program for small value-added food processors operating at retail in the North Central region. The specific objectives of this project are 1) Develop, implement, and evaluate a comprehensive FSMA-based food safety education program for small, value-added food processors 2) Develop, implement, and evaluate an outreach program that delivers ongoing support and reinforces key food safety messages included in FSMA, and 3) Communicate project results to stakeholders across the North Central region, to USDA and national partner network. To achieve this, our collaborative team has been conducting a series of training and/or workshops on cottage foods law, Better Process Control School (BPCS)-acidified foods, BPCS-acidified & low acid canned foods, HACCP training, environmental monitoring program, process validation & verification, hands on workshops on food preservation, and food labeling through in-person and/or online platforms. Participants expressed confidence (35% to 96%, prior to and post-training respectively) in understanding the science and practice of safe food processing. Over the last one year, our team has issued hundreds of process authority letters to a variety of small food processors in Wisconsin, Missouri and Kansas, resulting in numerous new value-added food entrepreneurs. Additionally, the project has provided opportunities to increase the number of BPCS (acidified), BPCS (acidified and low acid foods) and HACCP certified trainers within and beyond the North Central Region. For 2023-24, we will focus on the development of a food safety network across the North Central region. We will also continue providing one-on-one food safety consulting services, food safety training in addition to disseminating information via print and video case studies highlighting the key food safety concepts based on the FSMA principles. These fact sheets and videos will be available at no cost to food processors across the United States through our extension website.

Title: **PHASE II. FSMA Experimental Learning Outreach Program for Socially Disadvantaged Farmers in Rural Alabama, Georgia, and Mississippi**

Author(s): **E'licia L. Chaverest**, Alabama A&M University Small Farms Research Center
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Carolyn Banks, Alcorn State University
Terrence Wolfork, Fort Valley State University
Joshua Dawson, Fort Valley State University

Alabama A&M University (AAMU) Small Farms Research Center has over 25 years of experience working with limited resource socially disadvantaged minority farmers, cooperatives, agribusinesses, and faith-based organization in the southern region specifically Alabama, Georgia, Tennessee and Mississippi. Our overall mission is to assist our target audience by providing outreach and technical assistance, minimizing agricultural risk, educating them on sustainable agriculture practices and USDA government programs and services, and assisting them in making their farm operation more profitable. For this project titled, "Phase II. FSMA Experimental Learning Outreach Program for Socially Disadvantaged Farmers in Rural Alabama Georgia, and Mississippi" AAMU Small Farms Research Center will continue to train farmers on good agricultural practices, Produce Safety Alliance (PSA) Growers Training, farm-to-table food safety programs, and extend the PSA Train-to-Trainer program by educating extension agents and fellow farmers. The experimental learning outreach program will be executed with the collaboration of two 1890 universities (Alcorn State University and Fort Valley State University) with a rich history of educating and empowering socially disadvantaged farmers and under-served communities. In order for limited resource, socially disadvantage minority farmers to compete in the current food system, Food Safety Moderation Act (FSMA) training plays a vital role for the success of their farm operation. With the many racial and economic barriers faced by limited resource, socially disadvantaged minority farmers, this project lead by AAMU Small Farms Research Center in collaboration with our partners will provide hands-on food safety demonstration, case studies, facility and farm tour visits, and additional resources available to farmers. Through this project partners will educate and train (375) small, limited resource socially disadvantaged farmers, new and beginning producer, immigrants, veterans and extension agents.

Title: Mining FDA cGMP Violations to Reconcile, Improve, and Expand Food Safety Training Curriculum

Authors: **Byron D. Chaves**, University of Nebraska-Lincoln
Jennifer Acuff, University of Arkansas
Nicole Richard, University of Rhode Island
Luis Sabillon, New Mexico State University

GMP outline the minimum sanitary, environmental, and operational standards that a food processing facility must meet to manufacture, process, pack, or hold food in a safe and wholesome way, thus reducing the chances of product adulteration, and ultimately, the incidence of foodborne illness. One of the specific objectives of the 2021 FSOP project entitled “Customizing Current Good Manufacturing Practices Training and Education for Small and Very Small Food Facilities Across the U.S.” is to “Reconcile the content of GMP training and education materials with the most commonly reported GMP violations in food processing operations.” For this purpose, public data on cGMP violations available on the FDA Dashboard were extracted and analyzed. Domestic violations (50 states and Washington DC) from the 2016-2022 period were extracted using the search mechanisms for each one of the nine cGMP categories: 117.10 Personnel; 117.20 Plants and Grounds; 117.35 Sanitary operations; 117.37 Sanitary facilities and controls; 117.40 Equipment and utensils; 117.80 Processes and controls; 117.93 Warehousing and distribution; 117.95 Holding and distribution of human food by-products for use as animal food; and 117.110 Defect action levels). Violations within each category were further divided into major themes to determine what specific aspects lead to lower regulatory compliance. Some of the major violations are related to pest control, preventing contamination with toxic substances, equipment, and utensil cleanability, and raw material control. At the end of the data classification and tabulation, we expect to have a list of the 10 major violations that require further detail in the available cGMP training to help facilities avoid the same mistakes. Additional educational materials are being developed to expand sanitation terminology (cleanability, hygienic design, etc.) to increase understanding of these common violations within small and very small processors.

Grant number 2021-70020-35829, Project number: 2021-05759; Entitled: Customizing Current Good Manufacturing Practices Training and Education for Small and Very Small Food Facilities across the U.S.

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

Authors: **Byron Chaves**, University of Nebraska-Lincoln
Joseph Baumert, University of Nebraska-Lincoln
Melanie Downs, University of Nebraska-Lincoln
Bing Wang, University of Nebraska-Lincoln

Food manufacturers require continuous training beyond the foundational PCQI course. The long-term goal of this project is to build capacity to develop and implement adequate food safety plans. 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. The advanced curriculum is divided into four modules: hazard analysis and risk assessment, validation of process preventive controls, effective food allergen management, and pathogen environmental monitoring. Implementation of this project has been severely interrupted by travel restrictions due to the COVID-19 pandemic. The curriculum is mostly completed, with pilot sessions already offered in Nebraska and the region. Training sessions in Guam and Puerto Rico have been delivered. Three interns from Puerto Rico spent 4 months in Nebraska learning about food safety extension and taking the lead on some of the materials. Three more interns, two from Guam and one from Puerto Rico, will spend summer 2023 in Nebraska working on various food safety extension and outreach projects. The summer interns will attend IAFP 2023 in Toronto. Our insular collaborators attended IAFP 2022 and Dr. Jian Wang will attend IAFP 2023 as part of our collaboration. Ultimately, we hope to establish meaningful connections with industry, faculty, and students in Guam and Puerto Rico to increase capacity and identify future training needs and opportunities. This requires in-person connections, which has been very challenging over the last two years.

Title: **Addressing Produce Safety Educational Needs for Non-English Speaking Produce Growers in the Midwest**

Author(s): **Shannon M. Coleman**, Iowa State University
Melissa Cater, Louisiana State University
Smaranda Andrews., Iowa State University
Manreet Bhullar, Kansas State University
Londa Nwadike, Kansas State University/ University of Missouri
Isabel Coll, Iowa State University

This project seeks to build educational capacity for refugee small-scale fresh produce growers. Social services organizations allow growers to create a new life with access to space to grow food and start their businesses. However, minimal food safety materials are available for these audiences in their native languages. Research reports that communicating with people who do not share the same first language is challenging. The project seeks to strengthen the knowledge and mindset among small-scale refugee growers on food safety practices through videos and poster resources. During the fall of 2022, the project directors met for a half-day retreat to discuss the project goals and outcomes. The team's approach to the outcomes included meeting with consults (i.e., community partners for an advisory board, video production teams, and experts in ag education). After the retreat, the team is exploring developing animated videos with complementary posters. The advisory board listening sessions will take place in late spring 2023.

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

Author(s): Shannon M. Coleman, Iowa State University
Melissa Cater, Louisiana State University
Kate Gilbert, Iowa State University

Barriers for these small processors include their lack of knowledge and understanding of basic food science principles (pH, water activity, shelf-life, etc.) and difficulties implementing food safety programs. For this project, an in-person curriculum to convey messages about food product development and safety, including differentiating shelf life and shelf stability. This programming will include problem-centered and real-world scenarios, giving the processor a broadened knowledge of their product and confidence to implement their new knowledge. This project aimed to assess participants' (n=10) knowledge of shelf-life facts, awareness of shelf-life impacts, and intention to implement good shelf-life practices for in-person shelf-life and stability courses. The three statements in the knowledge section and the six in the awareness section were evaluated on a 4-point Likert scale. Five items were measured on a 6-point Likert scale in the intention section. A non-parametric paired samples t-test, the Wilcoxon Signed Ranks test, revealed statistically significant increases in participants' knowledge ($p = 0.007$) and awareness ($p = 0.005$; see Table 1). Results from a non-parametric independent samples t-test, the Mann-Whitney test, showed no statistically significant differences between participants' change in knowledge, awareness, or intention based on gender, race, or having a license for their food processing facility. Similarly, there were no significant differences between participants' change in knowledge, awareness, or intention based on their level of education, as shown by a Kruskal-Wallis test. Our project addresses these food safety barriers, allowing processors to produce and market food more effectively.

Title: **Bridging the Gap: Expanding a HACCP-based Curriculum to Help Produce Growers Treat Agricultural Water**

Author(s): **Faith Critzer**, University of Georgia
John Buchanan, University of Tennessee
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Channah Rock, University of Arizona
Laura Strawn, Virginia Tech
Annette Wszelaki, University of Tennessee

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 previous FSOP collaboration with our team 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, we were able to deliver the curriculum through new FSOP funding which began in 2020. A total of 183 trainees have participated in train-the-trainer workshops from 39 different states and territories. Participants in the train-the-trainer course increased their knowledge by 20.95% based on the results of a pre/post-test. When asked how they would utilize the training, 82.7% of the TTT participants indicated they would use it to support growers and allied industries through one-on-one interactions, and 59.2% said they planned on using content for training. An additional 269 growers participated in the training held both in person as well as remotely. Amongst the grower training participants, knowledge of approaches for treating agricultural water increased by 21.95% as evaluated in a pre/post-test. In course evaluation for the grower training, 63.6% of participants rated the course as excellent with a mean score of 4.6 ± 0.56 on a 5-point Likert Scale. Ninety-eight percent of growers agreed or strongly agreed that they, “*gained a better perspective for steps involved in treating preharvest water,*” 96% felt they were, “*better equipped to discuss water treatment options,*” and 92% said they, “*had a better understanding of sanitizer chemistries.*” NMSU has translated all video content into Spanish and Haitian Creole, with future plans for Mandarin and Hindi.

This work was supported by Food Safety Outreach Program grant no. 2016-70020-25803 and 2020-70020-33024 from the USDA National Institute of Food and Agriculture.

Title: **Hands-on Food Safety and Regulatory Training for Members of Shared-use Commercial Kitchens in Florida**

Author(s): **Michelle Danyluk**, University of Florida
Matthew Krug, University of Florida
Imran Ahmad, Florida International University (presenter)
Jennifer Hagen, University of Florida
Sebastian Galindo, University of Florida

Food entrepreneurs commonly use shared-use commercial kitchens (e.g., incubators, accelerators) to launch new food-based businesses. Food safety and regulations are common hurdles that these entrepreneurs must face as they grow their businesses. In response, collaborators from the University of Florida and Florida International University created a unique hands-on curriculum that provides a basic overview of state and federal food regulations and outlines food safety plan examples that meet FSMA's Preventive Controls for Human Food Rule standards. This project aims to deliver the training to target audiences and assess short- and medium-term knowledge gains and impacts.

In 2021 and 2022, a total of 11 training events were held using the curriculum for 139 clientele. The trainings include seven 1-day workshops intended for food business owners/managers working out of shared-use kitchens, three half-day workshops for employees of these food businesses, and one 1-day in-service training targeted towards county Extension Agents within the UF system. At the end of each event, participants completed an evaluation form where they reported their knowledge in six topic areas related to food regulations and food safety before and after the training using a five-point Likert scale. All results were analyzed using a paired t-test.

Data collected from the 1-day workshops ($n = 72$) indicated a significant increase ($P < 0.001$) in perceived knowledge of participants across all topic areas, with an overall average of 2.69 pre-training and 4.37 post-training. Results from the in-service training ($n = 11$) and half-day workshops ($n = 56$) also showed significant increases ($P < 0.001$) in perceived knowledge for their respective audiences. These short-term impacts indicate that entrepreneurs will be better prepared for regulations they may face as their businesses grow. Furthermore, the workshops provided a unique opportunity for attendees to learn and practice basic food safety and sanitation techniques which will hopefully improve overall food safety practices in these shared environments.

Title: **Increasing Accessibility of Food Safety Education through Remote Learning Opportunities**

Author(s): **Michelle Danyluk**, University of Florida CREC, Lake Alfred, FL
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Harriett Paul, Florida Agriculture and Mechanical University

Produce safety training programs are designed to educate farmers on identification and reduction of risks through implementation of food safety practices. Trainings are typically in-person and instructor-led, which require time and money; barriers which prevent beginning and disadvantaged farmers from attending. To address this inequity, the University of Florida (UF) in collaboration with Florida Agricultural and Mechanical University (FAMU) developed digestible, remote learning produce food safety videos that are accessible to small, beginning, and minority farmers. Produce Safety Alliance (PSA) grower trainings were offered remotely by UF and FAMU to train students and farmers representing the target audiences. Results from focus groups, workshop evaluations, and surveys were used to guide the development of short "Produce Safety in Minutes" (PSM) videos, instructor-led recorded webinars, and discussion-based recorded case studies. Trained students and farmers were used as advisory board members for review of the PSM video series and participated in instructor-led webinars. Six students and 22 farmers have successfully participated and received certificates in the remote PSA trainings. Produce Safety resources, including PSM videos (18), instructor-led webinars (8), and case-studies (5), have been recorded. Resources targeted topics such as handwashing, monitoring toilet and handwashing facilities, cleaning and sanitizing, compost handling, etc. The advisory board review indicated the resources created increased their knowledge of the topic, are appropriate to be used as a training tool on their operation, and are representative of the diverse groups of people working in the produce industry. Farmers and students who participated in the PSA trainings are more prepared for Produce Safety Rule Inspection or to pursue a career in the produce industry. Accessible remote videos improve convenience of produce safety information to small, beginning, and minority farmers where traditional training settings require barriers to entry.

Grant number 2020-70020-33024, Project Number 2022-05113, entitled 'Development and Evaluation of a Remote Learning Produce Food Safety Curriculum'

Title: Food Safety Outreach in Rhode Island

Author(s): Margaret DeVos, Southside Community Land trust

Chandelle Wilson, Southside Community Land trust

Over the past decade, agencies all over the country have responded to the *Food Safety Modernization Act (FSMA)* with the production of educational resources, and model systems to help businesses address the very real and important concern of securing the integrity and safety of our food system. Most have not been designed to accommodate socially disadvantaged farmers in RI who continue to struggle grow their marketing beyond direct-to-consumer distribution systems. For these farmers, access to wholesale markets are blocked by lack of GAP certification.

Our goal is to level the playing field in Rhode Island to create access to capital, education and social connections in the food system among young and socially disadvantaged farmers with language, literacy, and cultural barriers.

SCLTs project:

- 1) Partners with local organizations that focus on food safety education, as well as our local cooperative extension to connect growers to the Good Agricultural Practices (GAP) and Serve Safe courses needed to begin the development of comprehensive FSMA compliance strategies.
- 2) Engages local community interpreters to support farmers in these courses and limit language barriers.
- 3) Provides one on one technical assistance to farmers to have their farm GAP certified and provides ongoing technical assistance to maintain compliance.
- 4) Assists farmers to register as produce farms per new FSMA related regulations in the State of RI.
- 5) Advises other farm service providers and food safety trainers in ways they can deliver services and training that are more accessible for disadvantaged farmers.

Title: Hybrid Training for Quality Assurance and Food Safety Programs Designed for Small-scale Food Processors and Distributors

Author(s): Erin DiCaprio, University of California at Davis
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Developing and implementing required Food Safety Plans can be challenging, especially for small-scale processors. The goal of this project is to develop a hybrid training curriculum to address food safety and regulatory knowledge gaps while meeting the need for flexible and low-cost training for small-scale food processors. To gain deeper insight into food safety training needs, the project team conducted interviews with food safety managers from small-scale food processing facilities to better understand current practices around food safety training and training challenges within their organization. Interview outcomes were presented at the 2023 International Association for Food Protection (IAFP) Annual Meeting. While approximately half of interviewees indicated a preference for in-person training for their organization, many felt that low-cost online food safety training would be of value. The online course material developed includes 41 short presentations and supplementary handouts in topic areas including food safety regulations, good manufacturing practices, quality assurance and quality control, food microbiology, and general food safety. All the learning modules were subjected to peer review in 2021/2022. Recording of material began in 2022, and all content will be finalized in 2023 and the course will be built in Moodle. Additionally, the project team has collaborated to host Preventive Controls Qualified Individual (PCQI) training in each state represented by the project team (60 certificates issued as of 04/10/2023). In 2023, PCQI training will be supplemented with hands-on learning specifically focused on cleaning and sanitation and food safety plan development. A no-cost extension was granted, allowing for completion of the course and in-person workshops in 2024.

Title: **Growing the Culture, Collaboration, and Capacity of Farmer-to-Farmer Food Safety Trainers**

Author(s): **Cristina Dominguez**, La Semilla Food Center
Anita Adalja, La Semilla Food Center
Jeanette Ramirez, La Semilla Food Center
Mario Holguin, La Semilla Food Center

La Semilla Food Center is a community-based organization and food hub that serves the needs of non-traditional, niche, and hard-to-reach grower audiences in the Paso del Norte region. Through this project, La Semilla is reframing food safety as a practice that is rooted in community care and worker well-being and safety, rather than centering on the regulatory aspects or technical skills. We are partnering with active farmers who are not generally covered by the Produce Safety Rule and who are not typically represented in food safety specialist spaces through a year-long, 120-hour immersive ambassadorship in practical food safety. Through this program, ambassadors will experience deep facilitation skills training rooted in anti-oppression and popular education, food safety deep dives into specific topics, trainer of trainer programming, opportunities to co-facilitate food safety training alongside lead trainers, practice in conducting risk assessments, opportunities to participate in a community of practice and more. Additionally, the ambassadors will be providing their practical skills and lived experience as farmers to co-create a tiered food safety curriculum that will be culturally relevant and impactful to the growers in the La Semilla agroecology network. This curriculum will have multi-county, state-wide, and multi-state impact, and will be part of the approved training for the state sponsored Farm to Institution Approved Supplier Program. Previously, La Semilla was an active partner in another community-based organization FSOP Community Outreach Project, where we assisted in the development of curriculum, Spanish translation, and delivery of that project's food safety trainings which served states in the Four Corners region. This project builds upon our existing approach and curriculum, incorporating La Semilla's human-centered design to refine trainings and reach new, non-traditional, hard-to-reach audiences. Through our ambassadorship and curriculum redevelopment, the trainings will be led by known community members, including farmers, who both reflect and understand the needs of our target audiences.

Title: **Enhancing Food Safety Capacity of Western Elderberry Producers:
Best Practices for Harvest and Processing**

Author(s): **Gwenaël Engelskirchen**, University of California
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Blue elderberry (*Sambucus nigra* spp. *cerulea*) is a native perennial that grows naturally in California and other western states in the US. Increasingly, blue elderberry is planted on farms, often in multi-species hedgerows, with the goal of encouraging biodiversity and carbon sequestration. Both elder fruits and flowers can be used in a wide range of value-added food products, such as syrups, cordials, jellies, teas, and vinegars. The goal of this project is to increase the understanding and adoption of food safety practices across the supply chain, from harvest to processing (e.g., drying, freezing, jam production, etc.) for this crop. In 2022, the project team organized a two-part webinar series addressing food safety considerations and best practices for harvesting, handling, and processing elderberries and flowers. The webinars featured elderberry processors and product makers as guest speakers, and discussed when small and mid-scale growers might wish to pursue Cottage Food, Processed Food Registration, and third-party GAP certification. A recording of both sessions was shared with all 125 registrants. To date in 2023, the project team supported two California elderberry processors/handlers in completing a Preventive Controls Qualified Individual (PCQI) training. Four guides on best practices related to (1) harvesting, (2) post-harvest handling, (3) drying, and (4) freezing and storage of elderberry fruit and flowers are undergoing final revisions. Findings from site visits, informal interviews, and a survey of elder fruit and flower post-harvest and processing practices conducted in 2021 (n=61) will inform the planning of a series of workshops and short videos highlighting best practices and food safety considerations from harvesting to processing elderberries.

Title: **Relationship Driven Food Safety Technical Assistance to California Small Farmers**

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

According to 2017 agricultural census data, about 21,000 farms in California need to be in compliance with the Food Safety Modernization Act's (FSMA) Produce Safety Rule (PSR). Of those, 86% percent are small and medium scale (under \$500k). Community Alliance with Family Farmers (CAFF) is a non-profit organization that has been working with family farmers throughout California for over 40 years. This project deepens our relationships with Black, Indigenous, and People of Color (BIPOC) farmers and is providing them appropriate food safety technical assistance. Additionally, we are prioritizing providing technical assistance to small-scale and beginning farmers. To accomplish those objectives, we have been collaborating with other CAFF programs, University of California Extension Small Farms Advisors, various locally based agriculture focused non-profits, Coke Farm, Fresno BIPOC Produce, and our network of farmers. We have been working on completing four main objectives: 1) strengthening relationships with BIPOC farmers, 2) providing food safety office hours, 3) offering the third round of the Food Safety Partner Farm Program, and 4) creating hands-on training activities (e.g., how to properly use sanitizers). This project started in October 2022 and as of April 2023, we have collaborated with Coke Farm and Fresno BIPOC produce to enroll six farmers in our Food Safety Partner Farm Program, 100% of which are BIPOC farmers. These farmers have worked with CAFF staff all winter to prepare for GAP audits and to improve their food safety practices overall. We have seen thus far that farmers are deeply appreciative for the free, vital food safety support. At this time, we are early in this project's timeline, and we look forward to reporting out on outcomes at future meetings.

Title: Development of a Virtual Reality Food Safety Training Program for Employees in Small and Medium Scale Food Processing Facilities

Authors:Yaohua Feng, Purdue University
Elma Kontor- Manu, Purdue University

Food safety training can be daunting for employees in small and medium- scale food processing facilities because some training programs can be expensive, time consuming, and unappealing due to a lack of visual cues as well as interactive or hands-on sessions. Virtual reality programs have the potential to be adapted to deliver such hands-on learning experience in food safety trainings with an added benefit of being less time consuming and less expensive than traditional training sessions. Creating a food safety training program using virtual reality can support small and medium- scale processors' food safety training, which can subsequently help develop the food safety culture in the industry. This study seeks to develop a low-cost and effective transformative food safety program using virtual reality, to engage small and medium- scale food processors. The virtual training model is being developed to address two educational modules environmental monitoring, and allergen control. A quantitative and qualitative approach will be used to collect data from study participants. The developed model will be tested for 1) user experience and usability 2) interaction and 3) in-game test performance. Key outcome from this study is to develop a new educational dissemination tool that will support small and medium-scale food processing facilities in manufacturing safe foods for human consumption.

Title: A Multi-state Inspector Interview Project to Assess Food Safety and Regulatory Considerations with Small Produce Drying Facilities

Author(s): Yaohua Feng, Purdue University
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The need to assess food safety practices associated with produce drying has been called to attention by the increase in foodborne outbreaks involving low-moisture foods. The regulations regarding dried produce production vary between states, thus potentially acting as a barrier for small-scale processors in the United States to comply with the regulations.

The purpose of the study is to assess how dried produce regulation variability impacts inspection and identify food safety resource needs for small-scale produce drying facilities.

Participant recruitment was conducted on a multi-state level through word of mouth and local points of contact. The interview script was reviewed, and pilot tested by three university food safety specialists and three regulatory professionals, respectively.

Of the 25 participants, about half had inspected small to very-small scale produce drying facilities. Participants mentioned a variety of regulations used to conduct inspections, with a general trend referring to versions of the Federal Food Code. The inspection parameters mentioned by participants varied but generally included inspecting sanitation and food hazards. Participants gave mixed answers regarding water activity and time-temperature controls for safety. Challenges regarding the regulations and the produce drying process included lack of specificity, overwhelming length and confusing to interpret. A common theme was participants view their job as having dual roles, inspector, and educator. The educator role allows the inspector to communicate and to build trusting relationships with the processors, thus resulting in an effective communication channel for a successful inspection. All participants agree that more technical support for clarity of different regulations is needed, and a majority agree that more training needs to be offered for inspectors and processors.

Results from this study highlight the variation in regulatory interpretation and identifies a need for produce drying technical support and guidance for the dried produce industry.

Title: On-farm Food Safety: Military Veteran Farmer Extension Webinars

Author(s): Yaohua Feng, Purdue University
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Han Chen, Purdue University
Joe Ricker, AgrAbility

Many veterans are drawn to farming because they have a strong desire to work with their hands and contribute to their community. Additionally, this group of farmers may have been disconnected from society for many years and may be behind in the current on-farm food safety standards. These unique attributes highlight the need for tailored educational materials.

The goal of the extension efforts was to provide useful on-farm food safety education to military veteran farmers and other small- and medium- sized farmers.

Researchers coordinated 8 webinars, presented by extension and industry professionals in the months of September through December of 2022. The webinars covered a variety of on-farm food safety topics. Participants were recruited through veteran farmer social media groups, veteran farmer organization contact lists and word of mouth. The webinars were recorded and posted on YouTube for further outreach.

A total of 119 participants attended the webinars, which was 97% of the registrants (n= 123). The webinars reached 24 states in the United States. Most participants were from Indiana and Virginia, followed by Texas, Illinois, and Kentucky. Most participants (84%) were military veteran farmers, while 8% said they were associated with veteran farmers (i.e. spouse), and 9% were not affiliated with veteran farmers. Participants' farming experience in years varied, with 26% only having 1-3 years of experience and 16% having less than a year of farming experience. Most participants who grew produce (55%) were qualified for the Produce Safety Rule exemption; thus, they were not required to follow the PSR requirements.

The veteran farmer webinar series provided on-farm food safety education on a multi-state level and will continue to provide education through online YouTube postings.

Title: **Promoting Safe Practices Through Preservation of Food and Native American Culture - Food Safety Through Preservation**

Author(s): **Jessica Fish**, Cankdeska Cikana Community College
Julie Garden-Robinson, North Dakota State University

On the Spirit Lake Reservation, many families struggle with poverty, living in a food desert, and the fact that 50% of residents don't have regular access to a vehicle. Cankdeska Cikana Community College (CCCC) has worked towards the goal of food sovereignty for the residents of its reservation.

CCCC asked the question: Who cares about food safety when food availability is in question? The Food Safety Through Preservation (FSTP) program tries to address two issues with one approach.

FSTP will create food preservation microcredentials in the areas of water bath and pressure canning, drying and freezing. The programs will include both modern and traditional preservation methods. With access to this information, students will be able to preserve the food they grow for use in their own homes, or for sale at farmers markets.

CCCC, in partnership with North Dakota State University, will create curriculum using scientifically tested food preservation methods. Safety aspects of the process will be emphasized throughout the process.

Once the curriculum has been developed, the materials will be available for other extension programs to integrate into their communities.

It is important to note that the traditional Dakota preservation methods researched and created by CCCC *will not be made available to outside institutions*. Traditional Indigenous Knowledge is an important and often overlooked issue. Rather than include this information, we will include information on how the extension programs could integrate their own traditional knowledge into the program.

Title: Engaging Qualified Exempt SMPs to Comply with FSMA Preventive Controls for Human Food

Author(s): Jill Fitzsimmons, University of Massachusetts Amherst
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Despite significant efforts among extension and food safety providers to engage small and medium processors (SMPs) in pursuing compliance with FSMA's Preventive Controls (PC) for Human Food requirements, the FDA has expressed surprise with how few attestations have been filed to-date, compared with FDA's anticipations based on eligibility. To date fewer than 600 Qualified Exempt SMPs in the Northeast have filed attestations, suggesting that SMPs are either not aware of the Preventive Controls regulations, or that they are aware, but choose not to file. This lack of participation in fulfilling regulatory obligations has important implications both for the SMPs that are out of compliance, and for the government's ability to maintain a safe food supply. Outreach and engagement models that Food Safety Communicators have used in the past to reach their target audience do not appear to be reaching SMPs. In this proposal, we propose a series of innovative methods and activities to shift the paradigm of outreach and engagement to engage this particularly difficult-to-reach target audience of SMPs.

Processors that are not aware of the PC Rule will not comply with the Rule; The critical missing step towards increased SMP compliance is engaging SMPs to learn about the PC Rule and access PC Resources, such as online materials, technical support tools, trainings, educators, and consultants. We expand traditional outreach strategies to engage SMPs to take that first critical step to learn about the PC Rule and access PC Resources. We leverage existing resources and efforts within Northeast Center to Advance Food Safety (NECAFS) and use behavioral science strategies tools to identify novel outreach content and marketing to engage this difficult-to-reach target audience of SMPs in the Northeast. The long-term goal of this project is to increase SMP compliance with PC by enacting a paradigm shift in Food Safety Communicators' outreach strategy. To achieve this, we pursue three Objectives:

Obj. 1: Work with the food safety community in the Northeast to identify and systematically analyze outreach and extension barriers and opportunities to engaging and supporting SMPs to Comply with PC.

Obj. 2: Use behavioral science methods to ask SMPs to identify the most promising outreach methods that would encourage SMP uptake of PC Compliance Extension materials.

Obj. 3: Use results from Objective 2 to develop a wrap-around PC Outreach and Awareness campaign and increase the number of Qualified Exempt SMPs in the Northeast that use PC Resources.

This Collaborative Engagement project (A4182) will provide rigorous new outreach and engagement models to increase SMP use of PC Resources, leading to increased PC Compliance and a safe food supply.

Title: Progress of Interactive Tools to Improve the Practice of Food Safety for Processors (iTIPS) FSOP Project

Author(s): Nancy Flores, New Mexico State University
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Shannon M. Coleman, Iowa State University
Barbara Chamberlin, New Mexico State University

Food manufacturing facilities and commercial incubator kitchens have created opportunities for small companies to produce value-added products. While these diverse manufactures understand their processing methods, they often lack experience, training and resources specific to the food safety risks in these facilities.

The “Interactive Tools to Improve the Practice of Food Safety” (iTIPS) is a multi-state (IA, MA, NM) project that will develop an interactive food safety virtual lab for these food processors and educators.

The interactive training was designed using a research-based process, with an interdisciplinary team of food scientists, gaming experts and evaluators. The team has conducted a survey and semi-structured interview with a cohort of food industry partners (n=7) to better understand their food safety training needs. The iTIPS program content priorities and interactive gaming layout was developed during intensive focus meetings. Using the collected data, the team identified audience needs, articulated intended educational changes for users, and planned educational activities to foster this change. The team will refine gaming modules based on user testing data.

The industry cohort pointed to “time for training” and “cost of training” as the major issues standing in the way of food safety training, with “preventive controls for human food”, “sanitation and record keeping” and “allergen training” as the most important training topics needed. Additionally, they highlighted the need for short trainings, less technical, more applied hands-on interaction, and content presented in English and Spanish languages. Creating an interactive module that is accessible and freely available online in bilingual options enables stronger access to training tools to under-served communities with limited resources. This content will help improve food safety practices and regulatory compliance, thereby assuring sustainable, value-added food products.

Title: **Innovative and Supplementary Food Safety Training, Education, and Outreach Program for Small and Medium-sized Food Producers and Processors**

Author(s): **Girish Ganjyal**, Washington State University
Trevor Lane, Washington State University
Stephanie Smith, Washington State University

Any person who works with food must be adequately trained to be able to recognize the hazards related to food production and processing and to implement the control methods to mitigate those hazards. The Food Safety Modernization Act (FSMA) presented the industry with new and more stringent requirements. These requirements vary across the industry and on the type and size of the firm, annual sale value, type of specialty crop or food product, and how the produced crop/product is further utilized. The complexity of the new regulations is overwhelming for producers, especially small to mid-sized farms, beginning and socially disadvantaged farmers, and small processors, who often struggle to determine which regulations apply to their operation and how to meet all the requirements. These stakeholders are still looking for assistance in making this significant transition to the new regulations and standards of food safety.

Thus, this project aims to develop and deliver science-based food safety educational outreach programs leveraging our current networks within the state to provide the local small and mid-sized food producers and processors with relevant tools and resources. A variety of training programs will be developed to cover key topics related to food safety and augment the standardized curriculum. The trainings will be offered in-person at different locations across Washington state as well as online to facilitate the participation of stakeholders in remote locations. This will facilitate their ability to make knowledgeable and cost-effective management decisions pertaining to the production of safe and healthy produce and value-added products.

During the pandemic, we had to pivot to online synchronous training delivery. We hosted 12 online trainings including 11 Preventive Controls for Human Food (PCHF) part two trainings and one Introduction to Third Party Food Safety Audits training. With our online trainings, we have been able to reach stakeholders who live in remote locations. We have held eight in-person trainings including one PCHF part two training, three Developing Food Safety Plan trainings, and four GMP and Basics of Sanitation trainings. With our in-person trainings, we have reached people in rural areas and partnered with our Washington State University Extension Counties.

We are in the final revision stages for the curriculum that will be delivered as part of our online asynchronous trainings. Trainings will be posted to our learning management system platform, TalentLMS, and open to the public after testing. Training topics include the Basics of Sanitation (English and Spanish), Food Microbiology (English and Spanish), and Food Safety for Small Scale Seafood Processors.

**Title: GLEAN (Game Learning to Educate and Advance kNowledge):
Transformative Food Safety Training for Farmers Market Vendors**

**Author(s): Kristen E. Gibson, University of Arkansas System Division of Agriculture
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Matheus Cezarotto, New Mexico State University
Pamela Martinez, New Mexico State University**

The long-term goal of this Collaborative Education and Training Project is to provide transformative and engaging food safety training to local food producers to increase food safety knowledge, elicit behavior change, and prevent food safety issues within direct-to-consumer venues such as farmers markets. This will be achieved through interactive multimedia learning tools packaged within an educational, web-based gaming platform. Importantly, this multimedia training approach is proven to aid in better understanding of concepts and adoption of behavior change. New and beginning farmers and those hoping to manufacture value-added products to sell in local food markets are our target audiences. The primary objectives to achieve our long-term goal are: 1) Identify knowledge gaps in the understanding of food safety risks related to products of local food producers; 2) Utilize science-based evidence and regulatory standards relevant to food safety risks at farmers markets to develop essential content for training tool; 3) Develop a game-based, food safety training tool for local food producers using a collaborative design process; and 4) Deliver and evaluate a novel Farmers Market Game for local food producers. Overall, the GLEAN project aims to design holistic and multi-pronged training tools that incorporate farmers market-specific food safety practices and the practicalities of starting, running, and potentially expanding a small business. This strategy is backed by empirical evidence and informed by stakeholder needs. Our hope is that it will attract new and underserved local food producers and enhance their engagement with the resulting game-based training tools.

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

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Microgreens are an emerging salad crop for which minimal information regarding food safety, industry best practices, regulatory nuances, and safe handling by consumers is available. Our long-term goal is to decrease potential food safety risks related to the production and distribution of microgreens. The objectives are to 1) characterize production and distribution aspects of the microgreens industry; 2) develop novel food safety training curriculum, best practice messaging for consumers, and guidance documents for buyers and regulators of microgreens; and 3) deliver materials to stakeholders across the microgreens supply chain. A nationwide microgreens consumer survey was conducted. To determine accuracy and quality of existing microgreen training materials available on the internet, a content analysis was completed. Semi-structured interviews along with surveys were conducted to further characterize production and distribution practices of microgreens growers. Training materials and guidance documents are being developed. Microgreens consumer survey (N=660) identified key practice messages related to safe handling of microgreens. To deliver messages, a social media communications plan and website have been established. The content analysis revealed most artifacts (N=223) minimally covered the food safety principles in the FDA FSMA PSR related to growing microgreens. Semi-structured interview transcripts (N=47) indicated a need to create a centralized source of essential content to support microgreens growers' needs. We have developed a consumer outreach campaign to convey evidence-based practices for handling microgreens. The content analysis further justified the need for scientifically valid food safety training and education materials for microgreens growers. The semi-structured interviews led to the identification of seven training products including an interactive game to identify food-contact surfaces, "clean versus sanitize" animation, and a video on how to remove seed hulls.

Title **Expanding the Capacity of Community-based Produce Safety Educators to Serve Hard-to-Reach Farmers in the Mid-Atlantic**

Author(s): **Lindsay Gilmour**, Eastern Shore Entrepreneurship Center
 Aleya Fraser, Eastern Shore Entrepreneurship Center

In 2020, the Easton Economic Development Corporation's project, Chesapeake Harvest, implemented an ongoing Community Outreach project funded by the Food Safety Outreach Program, *Building the Capacity of Community-Based Produce Safety Education for Hard-to-Reach Farmers in the Mid-Atlantic*. Programming associated with our project reached at least 222 regional growers and technical service providers with 14 online and in person educational opportunities. We also trained 8 produce safety educators (PSEs) and have provided more than 25 farm risk assessments and 12 farms have successfully achieved GAP audit readiness.

To increase the impact of the current program, this project, *Expanding the Capacity of Community-Based Produce Safety Educators to Serve Hard-to-Reach Farmers in the Mid-Atlantic*, provides advanced, train the trainer education and in-the-field experience, career development and training for our cohort of 8 African American, community-based produce safety educators (PSEs). Our team of community-based educators follow farmer to farmer training and extension models that show that social proximity, which is sharing similar socio-economic characteristics and behavior, is a key to building trust, information sharing and practice implementation.

We collaborate with trusted colleagues and community-based partners to reach underserved farmers in urban and rural areas to provide opportunities for the PSEs to deliver virtual and on-farm, experiential workshops. We also provide one-on-one coaching including technical assistance in produce safety risk assessment, worker training, post-harvest handling; and assist farmers in writing GAP compliant food safety plans, helping them feel equipped to undergo an audit and achieve compliance.

Our produce safety website and social media are also maintained through this grant to reach an even wider audience.

By providing free and subsidized education for our target audience, the project seeks to change the predominant farmer mindset that food safety regulations and certification are optional and burdensome steps only necessary for larger farms to pass inspection or an audit.

Title: **Building the Capacity of Community-based Produce Safety Education for Hard-to-reach Farmers in the Mid-Atlantic**

Author(s): **Lindsay Gilmour**, Easton Economic Development Center
Aleya Fraser, Easton Economic Development Center

In 2020, the Easton Economic Development Corporation's project, Chesapeake Harvest, implemented an ongoing Community Outreach project named *Building the Capacity of Community-Based Produce Safety Education for Hard-to-Reach Farmers in the Mid-Atlantic*. Programming associated with our project reached at least 222 regional growers and technical service providers with 14 online and in person educational opportunities. Each opportunity was designed to increase capacity of our food safety educators and increase knowledge towards creating a culture of food safety in all participants. These webinars and on farm workshops have been spread out geographically in the Mid-Atlantic and we also advertise our Zoom webinars to a large regional and national audience. The provision of one-on-one coaching for farmers who wish to create a food safety plan is a specialized and unique regional resource. To date we have provided 25 farm risk assessments and 12 farms have successfully achieved GAP audit readiness after 12-20 hours each of individualized coaching.

This project's objectives were to 1) Prepare 6 new community-based Produce Safety Educators to provide on-farm, culturally appropriate coaching, tools and solutions to very small and small Mid-Atlantic producers. 2) Continue to develop the skills and leadership of the 4 African American produce safety educator trainees we work with now through intensive classroom and "in-the-field" training to prepare them to coach farmers on best practices in food safety, GAP audit readiness, and wholesale appropriate post-harvest handling. 3) Create opportunities for farmer-to-farmer knowledge sharing amongst peers to increase the implementation rate of food safety practices of 100 economically disadvantaged, urban and hard-to-reach specialty crop farmers. 4) Enhance competitiveness and market reach of 28 economically disadvantaged, urban and small-scale specialty crop producers through on-farm risk assessments, one-on-one coaching and wholesale readiness training to prepare them to comply with food safety laws and certifications, and enter wholesale markets.

On top of these objectives, we were also able to create a robust website that serves as a resource for farmers and professionals and increase our social media presence and provide professional development for our cohort by sending them to conferences to teach diverse audiences about produce safety.

Title: **Community Oriented Opportunities for Learning (C.O.O.L.™) Food Safety from Farm to Table Project**

Author(s): **Tamu Green**, Agriculture and Food Science Department, SR1
Dorlisa Hutton, Agriculture and Food Science Department, SR1

SR1, a nonprofit based in Ridgeland, MS, is dedicated to addressing disparities in health, education, and technology. Through its Community Oriented Opportunities for Learning (C.O.O.L.™) Food Safety from Farm to Table project, SR1 aims to provide customized food safety education and outreach programs for socially disadvantaged and beginner farmers and ranchers (SDBFRS) in underserved rural communities of Mississippi and Alabama.

The objective of the project is to bridge the gap in food safety knowledge and resources for SDBFRS, particularly among Blacks, Latinx, and Indigenous farmers who face greater challenges in the food system. These farmers often earn lower wages, lack access to healthy food, and reside in food deserts perpetuated by systemic segregation.

The project utilizes a targeted approach, focusing on SDBFRS who have completed the Produce Safety Alliance's Grower Training. However, SDBFRS who have not met FSMA Produce Safety Rule requirements are also encouraged to participate. The program offers hands-on learning experiences, applying key food safety concepts across the entire farm-to-table continuum, including farming, processing, distribution, and consumption.

Through the project, participants gain essential knowledge and skills in food safety, enabling them to produce and provide safe, high-quality food to their communities. By addressing the specific challenges faced by SDBFRS, the initiative aims to improve their economic opportunities, enhance community health, and reduce disparities in access to healthy food.

The significance of this project lies in its potential to empower socially disadvantaged beginner farmers, promote equitable access to healthy food, and contribute to the overall well-being of rural underserved communities in Mississippi and Alabama. Through education and outreach, this initiative strives to foster a more inclusive and sustainable food system for generations to come.

Title: Strengthening Produce Safety Rule Understanding and Compliance through Real-life Applications for Local Food Growers in Virginia

Author: Stasia Greenewalt, Local Food Hub

Food safety is a risk to small farm economic viability in two primary ways: a) a food safety incident is a major threat to the reputational and business success of a farm, and b) institutional buyers are increasingly demanding food safety certification as a condition of purchasing. Many farms are hesitant about taking on the demands of food safety certification. Recordkeeping for higher levels of food safety are intensive, time-consuming, and often confusing for small farms.

The goal for this project is to increase competitiveness and opportunity for small to midsize growers and ensure that they adhere to the highest level of food safety and compliance with the Food Safety Modernization Act (FSMA) and the Produce Safety Rule (PSR). Local Food Hub will introduce FarmDoc, its unique PSR recordkeeping app, and incorporate a range of educational materials, both online and hands-on, to reinforce the value of best practices and methods of on-farm implementation. Educational materials will include a series of videos of Virginia growers sharing their on-farm food safety practices, with topics to include wildlife management, cleaning and sanitizing, employee training, post-harvest handling and an in-depth overview of qualified exemption. LFH will also develop portable demonstrations of farm innovations adapted from Alabama Extension and the National Farmers Union.

As a result of this project, Local Food Hub will achieve the following results: 1. Enhance Virginia LFG knowledge and implementation of the Produce Safety Rule; 2. Provide tools to simplify compliance with FSMA's PSR and GAP requirements, and; 3. Develop an evaluation and communication plan to ensure wide dissemination of results. These tools will increase knowledge and compliance of FSMA's Produce Safety Rule for Virginia Growers and beyond.

Title: **Training and Technical Support to Help Small Vegetable Farms Meet the Cleaning and Sanitization Requirements of the Produce Safety Rule**

Author(s): **Vernon Grubinger**, University of Vermont
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Billy Mitchel, Working Farms Fund and the National Farmers Union

Insufficient or inadequate cleaning schedules, insufficient documentation of implementation, and lack of Standard Operating Procedures used for cleaning and sanitizing of equipment are significant barriers to small farms achieving compliance with the Produce Safety Rule. This project addresses those barriers with a suite of educational resources, scale-appropriate trainings, and technical assistance. The goal of SCRUB is to help small, diversified farms identify their specific needs related to produce safety and to develop plans to address those needs, leading to the adoption of improved cleaning and sanitizing practices.

In year one of the project, 10 partner farms in GA, MI, NH, NY, and VT led two farmer-to-farmer remote workshops that identified information gaps and challenges as well as innovative solutions related to produce safety. Problem solving and sharing of SCRUB partner farms sparked the development of 12 webinars in year 2 and 3, conducted by farmers and service providers focused on high-priority topics: managing bins, doing more with less, wash-pack floors, wash water management, dry cleaning, employee management, and bubblers for washing leafy greens, working with farm building contractors, farmer parent. One hundred and forty-three unique individuals registered for the workshops including 129 small and medium-scale farmers growing approximately 1,320 acres of vegetables in 14 US states, and Quebec and Ontario.

The project developed a website that holds a curated set of 64 guides, templates, webinar recordings and videos that provide practical information on the adoption of produce safety practices by small farms. These SCRUB outputs and event recordings are housed on a dedicated sub-page of the UVM Extension Ag Engineering blog at <http://go.uvm.edu/scrub>. These resources have enjoyed 4,948 page views by 2,443 unique visitors over the past 18 months.

The SCRUB team to date has reached over 235 farmers among 128 farms as a result of 256 individual contacts (e.g. workshop, 1:1 meeting, phone call, email) and at least 388 contact hours. This work has resulted in 389 outcomes including 14 new produce safety plans, 20 farms improving postharvest ag water practice, 111 farms improving hygienic design for cleaning and sanitizing, 77 farms creating or improving SOPs, 20 farms improving employee training, and 101 farms improving produce safety culture.

Participating growers shared:

“We know this is important and we have been wanting to do this for a while.”

“Now that I have a template, I can work on it - starting from scratch was too much.”

“We have never prioritized wash/pack, and SCRUB gave us the kick in the behind we needed.”

Title: **Building a Food Safety Training Program to Empower Disadvantaged Producers in Alabama**

Author(s): **Janice Hall**, Auburn University
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The Building a Food Safety Training Program to Empower Disadvantaged Producers in Alabama is designed to help limited-resource minority growers in Alabama meet challenges faced by local farmers. The outreach will aim to provide food safety training and opportunities to underserved communities throughout the Black Belt region of the state. The target counties are noted for their especially low economic status. Most of the target audience will be small farmers with small inherited acreage whose desire is to hold onto their land and pass it down to future generations. These farmers have access to the fertile black belt soil but lack access and knowledge of getting the full benefit of its usage and food safety. This outreach will provide training and resources to assist in those efforts. There will be a variety of food safety programming offered to assist in empowering farmers with the food safety knowledge they will need to sell their produce and products in competitive market venues. To accommodate all socially disadvantaged farmers, additionally, this project will adapt curricula and delivery methods to meet the needs of low vision, low hearing, and low literacy audiences. This will include providing large print curricula materials, magnifying tools, PA systems, and large screens positioned for optimal viewing. These accommodations will also be available virtually for those unable to attend face to face. Participants will learn how to safely handle produce from field to processing. Food safety training subjects will involve, but not be limited to, water quality and use, land use, worker health and hygiene, manure and compost, wildlife management, rotational grazing, sanitation and post-harvesting, home-business startup in Alabama, processing jams and jellies, and serving safe food from purchase to consumption. The goals and outcomes will be evaluated using a combination of program efficacy, effectiveness, and impact. At the end of the project year, a Farm Resource Day will be held to allow growers and processors the opportunity to educate consumers on what they have learned and to sell produce they have grown. So far, we have modified, adapted, and conducted workshops using the Enhancing the Safety of Locally Grown Produce now “Marketing Safe Local Produce” to include a new agribusiness component, Home Food Preservation – Canning, and Alabama Cottage Food Law for business startup. Ongoing adaptation efforts are being conducted to provide a Produce Safety Alliance Growers Training word list of simple terms for low literacy farmers, supplemental slides, and increased font for low vision farmers. Public Address (PA) System has been used at all workshops to accommodate low hearing farmers. Magnifying glasses have been provided for low vision farmers. The Empowering Farmers advisory board have actively provided guidance and input throughout the process.

Title: **Small-Holder Immigrant-owned Farms Trained in FSMA Requirements (SHIFT)**

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

The 'Small-Holder Immigrant-owned Farms Trained in FSMA Requirements (SHIFT)' project serves primarily Mexican immigrant and other Latino-owned farms at various stages of development from pre-launch up to ten years of operation. At the center of SHIFT operations is ALBA's 100-acre organic farm training facility in the heart of the Salinas Valley. For over 20 years, ALBA has provided intensive on-farm education and training to over 700 aspiring farmers, college students and field workers, about 90% of which are Latino. Roughly 200 organic smallholder farms were incubated in this time, most of which were launched since the Food Safety Modernization Act (FSMA) passed in 2011.

The goal of SHIFT is to strengthen the food safety compliance capacity of beginning and socially disadvantaged farm-owners (BSDFs), field laborers and future food safety professionals. The project will serve 300 distinct beneficiaries, 90% being BSDFs.

Through outreach, workshops/field days, and -- crucially -- direct technical assistance, SHIFT will achieve the following objectives: 1) 75 start-up farm owners will gain knowledge and adopt Good Agricultural Practices (GAPs); 2) 75 regional farms will strengthen their knowledge and capacity to comply with FSMA requirements; 3) 150 Hartnell College students and field laborers will develop knowledge and skills to address gaps in organic farm food safety labor and services; and 4) 50 Black, Indigenous and People of Color (BIPOC) farmer-serving organizations will gain awareness of approaches to food safety assistance and be trained and advised on how to apply for USDA NIFA's Food Safety Outreach Program grants.

Overall, SHIFT will result in 150 farm owners and another 150 participants gaining knowledge on food safety, developing food safety plans on their land, and obtaining or renewing certification. In addition, ALBA's program staff will continue to develop assistance capacity through training and through working with partners on assessing the scope and magnitude of services needed.

Title: **Training Beginning, Immigrant, and Organic Specialty Crop Producers in FSMA Compliance to Access Wholesale and Institutional Markets**

Author(s): **Jennifer Hashley**, Tufts University Sara
 Poggi Davis, Tufts University
 Leah Jurman, Tufts University

As direct produce markets become increasingly competitive, vegetable growers are seeking to sell to larger institutional buyers that have higher food safety compliance standards. Targeted outreach and novel training approaches are essential for small-scale farmers to adopt food safety practices, complete audits and certifications, install required infrastructure, and achieve Food Safety Modernization Act (FSMA) compliance. Through New Entry's programs, these underserved audiences receive technically and culturally accessible food safety training. To date, three New Entry staff members have completed the Produce Safety Alliance (PSA) Trainer certification program and facilitated two PSA Grower Training courses for small -scale farmers in our local network. New Entry also coordinated and performed 11 mock audits for farmers preparing for Commonwealth Quality Program (CQP) certification with Massachusetts Department of Agricultural Resources (MDAR), a certification that is widely accepted by Massachusetts produce buyers. The mock audit process has allowed these producers to understand how to implement the CQP requirements and has provided participants with the risk assessment tools and food safety plan templates necessary for compliance. In addition, New Entry staff integrated food safety training into our crop production and farm business planning courses. We will continue to provide ongoing intensive individual technical assistance to 20+ small-scale and beginning farmers per year through on-farm visits, mock food safety audits, and connections to food safety resources. Through our national network, we will disseminate educational materials that assist over 2,500 small-scale and under-resourced vegetable producers across the United States to develop appropriate strategies for implementing sustainable on -farm food safety practices. These programs will improve food safety certification and compliance and, as a result, increase small-scale farmers' access to new institutional market channels.

Title: **Year Two of TRAIN: Targeted Resources Addressing Identified Needs in Maryland Worker Food Safety Training via On-farm Piloting of a Mixed Media Toolkit**

Author(s): **Shauna C. Henley**, University of Maryland Extension
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The Food Safety Modernization Act Produce Safety Rule (FSMA PSR) worker training for supervisors focuses on personnel who contact and/or supervise covered produce and/or food-contact surfaces. A year one survey was implemented statewide in Maryland where common themes for barriers to provide training for food safety practices were not having enough time (83%) or funds to administer proper training sessions, despite acknowledgement that food safety issues were a serious concern (90%).

In year two, the research team further developed the educational resources for its mixed-media toolkit based on the survey results. A significant realization that the project team noticed with our Maryland Food Safety Network was a lack of understanding around risk assessment. A media team visited several Maryland farms during the summer and fall of 2022 to showcase farm and crop diversity. These images and videos will be incorporated into four lessons and an animation, with a supervisor's guidebook for each lesson. The goal, based on our current resources, is to develop the mixed-media toolkit for field testing during the 2024 growing season. Our proposed educational resources include:

- A 30-second animation on "What Is a Risk Assessment?"
- Visual and Interactive on "How to Build Standard Operating Procedures for Working on the Farm"
- Error Based Learning: How to Spot Risky Activities on the Farm
- Farm Eye Spy
- Hands-On Problem Solving

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

Author(s): **Tristan Hudak**, International Rescue Committee
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The International Rescue Committee’s (IRC) “Expanded Refugee and Immigrant Food Safety Outreach Project in Sacramento” targeted three distinct audiences of refugee farmers throughout the duration of this project: Lu-Mien farmers, Nepali-Bhutanese refugees and Afghan refugee farmers working in the greater Sacramento area. Currently, Sacramento has one of the largest Afghan communities in the United States, and the population is growing as more refugees are expected to arrive in the area over the next 12 months. The IRC’s refugee farmers are not familiar with the rules and regulations around agriculture and food safety practices used in the US, which limits their options for marketing culturally relevant crops within their communities at food stands, grocery outlets, and wholesale buyers. In collaboration with partners at the University of California Agriculture and Natural Resources/University of California Cooperative Extension office (UCANR/UCCE), the IRC planned to directly reach 15 farmers with food safety outreach trainings, while disseminating training resources developed for these farmer groups to national cooperative extension networks and the broader IRC New Roots network. Videos were filmed on six different agricultural practices and were produced in three languages, including Lu-Mien, Dari (spoken by the Afghan community) and Nepali, for a total of 18 unique videos. The six topics covered in the videos included: (1) agricultural water, (2) biological soil amendments, (3) chemical use and safety, (4) employee health and hygiene, (5) equipment, tools and buildings and (6) land use and animal access. IRC and the University of California at Davis developed pre-post evaluation and survey tools to monitor the adoption of best practices by the farmers participating in the program. Survey results indicated significant knowledge gain in subject areas covered such as contamination sources (26%), sanitization of surfaces and storage containers (22%), and Food Safety Modernization Act (FSMA) compliance (25%).

Title: **Water Quality and the FSMA PSR: Developing Risk Assessment and Educational Tools for Farmers and Laboratories in the Upper Midwest**

Author(s): Annalisa Hultberg, University of Minnesota Extension
Phil Tocco, Michigan State University
Don Stoeckel, Don Stoeckel Environmental

The purpose of this project is to create innovative data-based educational tools centered around water testing and risk analysis of agricultural water in the upper Midwest, specifically Minnesota and Michigan.

In the past project year, the team has focused on launching the Risk Prioritization Tool (RPT) for growers to identify and mitigate produce safety risks associated with water use in the production of fresh fruits and vegetables. Existing hazard and risk assessment tools, along with the hazard-based framework of the proposed PSR water rule revision, were used to develop the qualitative RPT. A panel of stakeholders assessed the tool, offered input, and the RPT was updated. The team worked closely with stakeholders to determine the costs/benefits related to the usability of including more questions to produce a richer output for the user. A paper version of the RPT was pilot tested with members of the Plain community in Ohio in January 2023.

The final phase of the project in summer of 2023 will consist of field validation efforts in Minnesota and Michigan. Water samples (15 total) will be gathered from both ground and surface water sites in both states with the goal to validate risk level using sampling and analysis that is capable of direct detection of fecal-oral pathogens. At the time of sampling, the RPT will be utilized to evaluate the relative risk of various water sources under specific conditions at the time, such as weather, slope, runoff potential and the level of protection of the source.

Finally, the team will finalize a series of 3 videos that will guide growers through water quality used in agricultural production, such as “Understanding Hazard vs Risk in Agricultural Water”, “Vulnerability of Your Water Source”, and “The Role of Testing in Understanding Your Agricultural Water”. These videos are meant to be used in conjunction with the RPT and are meant to guide users through the key learning objectives of the tool, so that they can use it effectively to understand risk on their farm related to agricultural water use.

Title: **Enhancing Food Safety Outreach to Underrepresented Communities through Food Microbiology and Soil Amendments Related Hands-on Workshops**

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There have been over 2,000 Produce Safety Alliance (PSA) Grower Trainings in the United States. This has resulted in over 40,000 growers being trained. However, underserved minority groups are often overlooked. In addition, the prescribed training leaves little time for hands-on activities/supplemental educational material that would reinforce understanding of the concepts addressed. The project's overall objective was to develop food safety educational materials for underserved communities. These materials expand topics of food safety education concerns identified for the target audience. Graduate and undergraduate students at Alabama A&M University and Iowa State University were assigned specific educational resources to develop. The students were guided by weekly meetings with produce safety professionals. Topics were based on a needs assessment previously conducted. After several weeks of discussion and rounds of edits, the developed educational resources were sent to Advisory Board members for review. After this, edits as suggested by Advisory Board members were made and the students presented this during the weekly meeting. All activities were then finalized. Program assistants developed interactive activities, facilitator and participant guides. Other supplemental resources were also designed, such as videos demonstrating microbiological techniques such as streaking, plating, and environmental sampling. Furthermore, short recorded 5-minute learning modules were developed. For this project, undergraduate and graduate students were trained on the development of produce safety educational materials. The developed educational material will be used in workshops aimed at meeting the needs of underserved minority groups that are often hard to reach. These individuals will be provided an opportunity to participate in interactive activities that could be used to implement change in their operations. The developed educational materials will be submitted to the Food Safety Resource Clearinghouse.

Title: Ensuring Food Safety Competency of Produce Growers and Processors in the North Central Region Through Expanded Collaboration and Engagement with Diversified and Underserved Populations, Education, Training, and Technical Assistance

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For seven years, the North Central Region Center for FSMA Training, Extension, and Technical Assistance (NCR FSMA Center) has supported the infrastructure of the national food safety program by coordinating information within the region related to the FSMA Produce Safety Rule (PSR) and Preventive Controls for Human Food Rule (PC).

Our four objectives:

- 1) Expand the produce safety network within the NCR to include underserved produce industry partners, and more diverse producers, processors, and educators
- 2) Collaborate with and support the NCR produce safety network
- 3) Create, modify, and validate produce safety training materials, focusing on underserved and diverse production and processing environments and new educators
- 4) Professional development and technical assistance of NCR produce safety educators, growers, and processors.

Our methods:

- 1) work to develop partnerships from under-served communities and institutions
- 2) connect educators, regulators, and our FSOP awardees
- 3) meet regularly- as a PI team, with the state leads, and with the other regional centers, and through monthly meetings:
 - Webinars- for educators of growers and processors
 - Inspectors' meetings- for state employees who conduct inspections
 - Inventory/Outreach meetings- for state employees who oversee their farm inventory
 - Program Managers' meetings- for state employees responsible for program oversight and FDA reporting
- 4) share and develop new resources and support our partners as they create new resources and ensure resources are shared on the Clearinghouse
- 5) organize virtual trainings, a fall in-person event for PSA trainings/inspectors, and a spring annual conference
- 6) support educators and trainings through our training support stipends, professional development funds, and staff time.

We utilize a formal evaluator to ensure that the objectives are met. We have 4 peer reviews journal articles and 25 success stories that highlight a portion of the impact of the NCR Center (<https://www.ncrfsma.org/>).

Title: A Diversified Approach to Building Training Capacity in Underserved Communities

Author(s): Carolyn Jones, Mississippi Minority Farmers Alliance (MMFA)

Background: Many farm communities are underserved by extension and consultants for many valid reasons. Farmers understand the importance of food safety certification; however, the process is often viewed as an obstacle, due to the lack of training and information.

Purpose: To provide outreach & technical assistance to 130 farmers associated with MMFA.

Methodology: Several training and technical assistance methodologies are being employed to build the food safety culture within MMFA. Our methodologies are derived from our experience in working with small limited resource farmers in small rural communities.

Results: Increased market access, Good Agricultural Practices (GAP) certifications for 10 plus farmers.

Outcomes: Youth training for long term sustainability, establish food safety team to assist the alliance with peer mentoring so that expertise remains in community.

Title: Opening New Markets for Small Farms by Expanding Hawai'i's USDA GroupGAP Food Safety Certification Program

Author(s): **Kevin Kelly**, North Shore Economic Vitality Partnership
Lisa Rhoden, North Shore Economic Vitality Partnership
Francesca Scola, North Shore Economic Vitality Partnership

Over 92% of the food in Hawai'i is being imported from thousands of miles away, creating an urgent need to increase local production. With over 70% of Hawai'i's farms being less than ten acres, it is a challenge to provide the quality and consistency required by local institutional and commercial markets. To complicate matters, there are less than 50 food safety certified farms that can sell into markets that require certification.

The "Opening New Markets for Small Farms by Expanding Hawai'i's USDA GroupGAP Food Safety Training and Certification Program" project is focused on expanding Hawai'i GroupGAP across the state by 1) informing and educating Hawai'i's farmers about the importance, benefits, and financial value of food safety certification and 2) significantly increase the number of farms participating in Hawai'i GroupGAP.

The project facilitates outreach efforts through four events: Harmonized GAP farm days, GroupGAP informational webinars, partner outreach events, and HeavyConnect digital record keeping demonstrations. Farmers participating in these events are generally surprised to learn that certification is not as difficult or expensive as they had expected and are overwhelmingly interested in accessing new commercial and institutional markets.

Two farms that attended outreach events are now in Hawai'i GroupGAP's cohort seven and will attain certification this year. There is already a list of farmers interested in our next cohort, including several farms that supply some of the largest produce distributors in the state. Our corporate partners are also helping incentivize farmers to get certified by providing free record keeping software and inter-island shipping.

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

Author(s): **Jang Ho Kim**, University of Idaho
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The Food Safety Modernization Act (FSMA) improves foodborne illness surveillance systems in the US and most countries exporting food and agricultural commodities to the US. According to the World Health Organization, foodborne diseases have been a significant public health issue across the Western Pacific region. 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 FSMA requirements due to a lack of timely training opportunities and geographic barriers.

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. The goal of this project is to provide food safety education and trainings to extension agents/educators, public health agents, and agricultural professionals 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.

Recently, our Train-the-Trainer trainings have been successfully provided to the food and public health professionals of Guam, the Commonwealth of the Northern Marianas, American Samoa, and Micronesia including the Marshall Islands and Palau. These trained food safety professionals are now providing current food safety trainings and information to socially disadvantaged and isolated very small farms, processors, and other stakeholders within their jurisdictions, and these project training activities are currently monitored and evaluated. In addition to education dissemination, the project has established a strong food safety professional network in the region.

Title: **Sanitation Control Practitioner Program (SCPP)- The Development of an Education Sanitation Program for Small Processors**

Author(s): **Amanda Kinchla**, University of Massachusetts
Clint Stevenson, North Carolina State University
Rob Machado, University of Maine
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There is a strong need for additional and more targeted training for small processors specific to sanitation. While many of this audience base has had some preliminary training (i.e., ServSafe, basic cGMP, etc.), there is a lack of inherent foundational food safety knowledge that enables them to confidently apply this knowledge into an effective and working sanitation program. This project will build on the collaborative work of a three-state team to develop accessible, scale-appropriate, and motivating content that integrates a multi-modal approach that provides suitable information small processors need to successfully implement a regulatory compliant sanitation program. The goal of this project is to make information regarding cleaning and sanitation accessible and practical with the appropriate tools for small processors to confidently implement and manage a program suitable for their facility and products. This program will facilitate the long-term goal to increase the number of processors nationwide in developing, implementing and managing sanitation programs, thus serving to reduce the overall risk of foodborne illness while supporting small businesses. To achieve these goals, we will initially engage with our target audience (small processors) to assess the true educational and technical support needs, develop a targeted training program aimed at the needs of small processors and then deploy and evaluate the comprehensive program with small processors. Throughout the development of this project, we will engage directly with small processors (including participants from underserved communities) facilitated by organizational partners to ensure that the sanitation program content and delivery maintain relevance to this audience.

Title: **Western Regional Center to Enhance Food Safety (WRCEFS)**

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The Western Regional Center to Enhance Food Safety (WRCEFS) is one of four U.S. regional centers with the overarching aim to foster collaboration in food safety education and food industry support related to the Food Safety Modernization Act. The center goals include supporting the development of regional food safety education and outreach opportunities for food safety trainers, coordinating a regional communication strategy to foster collaborations and discussions on food safety concerns and best practices, supporting the development of supplemental resources for food safety trainings and facilitating peer review of these resources, and evaluating the impact of educational activities in the Western region through ongoing program assessment. Since September 2021, WRCEFS has supported and/or facilitated two PSA train-the-trainer courses and two produce safety professional development workshops. WRCEFS partners have provided more than 141 workshops and other educational opportunities to food industry and professionals supporting the industry during this period. From September 1, 2021 to August 31, 2022, regional members shared information on 71 PSA grower trainings, 10 FSPCA PCHF, six FSPCA PCHF part two trainings, and 31 other food safety trainings. For trainings with submitted evaluation data, participants experienced an increase in knowledge after the 32 PSA (pre-test average= 15.97/25; post-test average= 19.41/25 points) and five FSPCA PCHF (pre-test average=5.16/15; post-test average= 7.34/15 points) trainings. To communicate with members, in-person and online meetings, monthly newsletters (234 people reached), the WRCEFS website (7,109 views; Sept. 2021-Apr. 2023), and social media have been actively used. Since the launch of the peer review process, 29 add-ons have been submitted for peer review, and 23 have been accepted through the review process at the FSR Clearinghouse. The review process for short courses was piloted with three courses during Spring 2022. It was opened for submissions in March 2023. User guides and video demonstrations of the peer review process are under development.

Title: Increasing Accessibility of Food Safety Resources to Tribal Growers in Arizona to Advance Resilience of Native Nations

Author(s): **Shujuan (Lucy) Li**, University of Arizona
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Native growers embrace specific cultural practices associated with produce farming and food manufacturing/processing that are relevant to their status as sovereign nations. Though there is a national Produce Safety Rule tribal curriculum in development, local culturally appropriate food safety education and outreach efforts are still necessary for growers on tribal lands in Arizona. We promote a new approach – connecting food safety with integrated pest management (IPM) – to increase food safety capacity in tribal communities, enhance the acceptance of food safety practices, strengthen and expand existing networks and develop/mentor new educators/scientists as future leaders in tribal communities.

The project team and our collaborators conducted a series of Food Safety and IPM workshops on tribal lands in 2022-2023. In collaboration with our tribal Extension agents and tribal collaborators, we identified specific food safety training priorities within tribal communities to develop and implement culturally appropriate integrated food safety education and outreach programs for tribal communities in Arizona. Over 160 tribal participants attended our in-person trainings, including but not limited to, Colorado River Indian Tribes, Hualapai Tribe, San Carlos Apache Tribe, Navajo Nation, Hopi Tribe and Cocopah Tribe. Key outcomes/impacts include: 1) expanded on existing relationships to deliver integrated food safety education to tribal communities; 2) improved awareness and knowledge of food safety practices to protect public health and reduce food-borne illnesses; 3) cultivated positive attitude toward adopting food safety practices; and 4) improved engagement with underserved stakeholder audiences challenged by food safety issues. Our novel approach will improve food safety outcomes and respectfully enhance resilience within underserved communities and will serve as a model for future outreach to tribal communities.

Title: Establishing a Food Safety Model Farm as a Training Center to Advance Food Safety for Hmong Farmers in Missouri

Author(s): Pei Liu, University of Missouri – Columbia
Touria Eaton, Lincoln University

The development of Food Safety Modernization Act Produce Safety Rule (FSMA PSR) did help farmers know about the risks of foodborne illnesses associate with produce production. It also helped farmers get trained and implement food safety practices to avoid food contamination and foodborne illnesses. However, the language barrier prevents Hmong farmers from benefitting from FSMA PSR trainings and therefore they are still using practices that may lead to produce contamination and to foodborne illnesses. The long-term goal of this **community outreach project** is to establish a produce safety model farm, serving as a training center, to advance food safety practices among the Hmong farmers in Missouri. The farm will have all the infrastructure and tools that are necessary for a food safe farm. The project uses the farm to train farmers and demonstrate food safety practices.

To determine the specific requirements for a farm to be a model food safe farm, designed to provide food safety training for Hmong farmers, six Hmong farmers were recruited to participate in a 60-minute interview. The interviews were translated to Hmong language. In the second phase, six trainers who were PSA-certified and had prior experience working with Hmong farmers were invited to participate in a 60-minute interview, during which they shared their opinions on the subject matter. The interviews with farmers and trainers were recorded and transcribed verbatim. The data were utilized for the preliminary indexing of concepts and themes. In the third and last phase of the project, observations were carried out to assess food safety handling behavior of the six recruited farmers, at their farms.

The data indicated that certain items, such as covered washing stations, storage containers/places, sanitizing chemicals, coolers, and plastic harvesting containers are a necessity in a food safe farm. The data also indicate that the cost was a significant obstacle to implementing food safety practices on farms. Some farmers expressed difficulties in maintaining records or notes while farming. PSA trainers stated that the lack of standard operating procedures and a limited understanding of food safety practices were also significant barriers for Hmong farmers to implementing food safety practices.

Through the establishment of a food safety model farm as a training center for Hmong farmers, this study aims to contribute towards reaching and empowering underserved audiences, primarily socially disadvantaged farmers in rural areas who operate small farms with limited resources. A food safety workshop will be developed in fall 2023, using the model farm established during summer 2023 as a training center.

Title: **Development and Implementation of a Customized and Culturally-Sensitive FSMA Supplemental Training Program for Hmong Farmers: A Community Outreach Project**

Author(s): Pei Liu, University of Missouri – Columbia
 Touria Eaton, Lincoln University

The food safety challenges posed by cultural differences between Hmong and Americans are distinct, yet the existing training program under the Food Safety Modernization Act (FSMA) does not adequately address the specific needs of Hmong farmers. The long-term goal was to develop a customized and culturally-sensitive FSMA supplemental education and outreach training program for Hmong farmers in southwest Missouri. More specifically, the study was to (1) identify the specific food safety training and education needs and food safety challenges faced by local Hmong farmers with particular consideration of their cultural values, (2) to develop innovative, culturally sensitive, and easy to understand food safety training supplemental materials guided by FSMA for Hmong farmers in English and Hmong, and (3) to evaluate customized and culturally-sensitive food safety supplemental program by Hmong farmers to assess usability and potential effectiveness.

Between 2020-2021, a total of five Hmong farmers from southwest Missouri and five certified trainers from the Produce Safety Alliance (PSA) were enlisted for a 60-minute interview. Additionally, food safety handling behavior observations were carried out at five Hmong farms (n=5) to assess their current needs and barriers for attending food safety training. Language was identified as the primary obstacle by all Hmong farmers when participating in FSMA training, followed by the training format, time constraints, perceived necessity for obtaining FSMA certificates, and impracticality. Using these findings, a customized and culturally-sensitive FSMA supplementary education and outreach training program was developed for Hmong farmers between 2022-2023. The training program includes a customized curriculum for low literacy farmers to practice food safety behavior based on PSA training, a handbook for Hmong farmers to practice food safety behavior based on PSA training, and a handbook for low literacy farmers to practice food safety behavior based on PSA training. Two food safety training workshops were offered to local farmers utilizing the newly developed training program. To assess the program's effectiveness, pre and post surveys (n=5) and post-farm observations (n=5) were conducted. The training program will be finalized in summer 2023. By taking their preferred learning methods into account, the findings will aid Hmong farmers in acquiring food safety knowledge more effectively.

Title: **Jumpstart to Farm Food Safety – Farm Food Safety Planning for Small and Medium-Sized Farms**

Author(s): **Robson Machado**, University of Maine Cooperative Extension
Mary S. Choate, University of New Hampshire Cooperative Extension
Jason Bolton, University of Maine Cooperative Extension

The University of Maine Cooperative Extension (UMCE) and the University of New Hampshire Cooperative Extension (UNHCE) are collaborating to provide one-on-one Farm Food Safety Plan (FFSP) writing assistance, and on-farm produce safety risk assessments (PSRA) to small and medium-sized produce farms in both states. This project provides a solid foundation for PSRA and FFSP writing and is executed by an experienced farm produce safety educator in each state.

In addition to the one-on-one support to 60 farmers—10 per year per state for the project’s three years—UMCE and UNHCE created a website to be the landing page for all resources developed during this project. The website includes or will include, by the end of the project, webinar recordings, registration for participation in the project, FFSP resources, and examples of FFSPs completed by farmers. In addition, the project includes creating a series of three webinars to invite and inform farmers about the project. The introductory (2022) and year two (2023) webinars were delivered and recorded and are available for anyone to view on the project’s website. Finally, in the last year of the project, we will invite participating farmers to provide a testimonial of their experiences. These short videos will showcase farms’ successes in the program, and all results will be shared through multiple outlets, including the NECAFS (The Northeast Center to Advance Food Safety) clearinghouse. Ten farms were visited in each state in 2022, and ten more per state are scheduled for the 2023 growing season. In addition, participating farmers are provided, as needed, with materials for a field handwashing station, and all farmers receive hygienically designed brushes. The PSRA showed that worker training programs and sanitation standard operating procedures were usually the FFSP portions that would significantly impact the farm’s food safety.

Title: Food Safety Capacity Building for Exempt Farms in Texas

**Author(s): Susie Marshall, Texas Organic Farmers & Gardeners Association
P. Wade Ross, Texas Small Farmers & Ranchers CBO**

Texas has numerous small, direct-marketing farms who are typically not the main audience for food safety training. These farms are typically low-resource farms and often lead by women and/or people of color. " Targeted Food Safety Training for Small Farms in Texas" develops resources for farmers and farmer-facing nonprofits to enhance the on-farm food safety of small, direct-marketing Exempt and Qualified Exempt farms. The project brings together statewide and regional organizations that work directly with the identified audience to increase food safety knowledge and skills while developing curriculum pieces that can be used across the state. With the Texas Organic Farmers and Gardeners Association (TOFGA) as the lead, this project will strengthen the capacity of each collaborating organization to provide food safety information and resources for their farmer networks beyond the grant period, increasing the ability of the farmer audience to build viable farms that can more easily transition to new marketing channels. The project leverages existing FSMA grower training materials from the PSA Grower Training curriculum and other Food Safety Outreach Programs to develop workshops on six topics pertinent to the intended farmers with their feedback, trains existing personnel at collaborating organizations, and develops an online food safety resource hub.

Title: Assisting Small- and Medium-sized Farmers through Cross-state Collaboration

Author(s): Billy McCarthy, National Farmers Union Foundation

Local food producers in the Midwest region, often small-scale diversified farming operations, face unique challenges in complying with FSMA regulations. Our target audience consists of small-to mid-sized farms, beginning farmers, socially disadvantaged farmers, and English-as-a-second-language (ESL) populations in four Midwestern states: Minnesota, Wisconsin, Iowa, and Indiana. Existing resources and infrastructure may not meet the target audience's distinct set of food safety needs and resource-strapped growers may have difficulty accessing scale-and culturally appropriate education and resources. Accordingly, this project aims to mitigate short-term barriers to knowledge acquisition and implementation so that a diverse population of local food producers can effectively identify and adhere to relevant food safety practices through promoting and facilitating access to food safety training, education, and technical assistance.

Methods include: 1) Deliver training and education tailored to the needs of the target audience; 2) Leverage online platforms to equip producers with readily accessible resources; 3) Provide individualized technical support to producers; 4) Reduce language barriers to accessing education and training for ESL producers; 5) Reduce the cost associated with attending trainings and workshops; and 6) Promote awareness about food safety regulations and coordinate with educators and regulators to expand the reach of training, education, and assistance.

NFUF has partnered with Farmers Union State Divisions in collaboration with local university extensions, Departments of Agriculture, and community-based organizations to execute this project. In year one, project partners: 1) Hosted or supported 9 workshops/PSA Grower Trainings reaching 266 participants (including Plain growers); 2) Produced 4 "Tech Talks" on qualified exemptions, record keeping, cleaning and sanitizing, and worker training as well as "Lunch & Learn" webinars in addition to promotion of a food safety podcast; 3) Supported 2 on-farm field days on post-harvest handling reaching 20 BIPOC growers in addition to providing direct assistance to 16 growers; 4) Supported the development of 10 factsheets in Spanish and Hmong and delivered 1 Spanish-language training on worker health and hygiene; 5) Provided financial support to 232 growers to attend workshops and trainings; 6) Attended 10 conferences/events and published 60 social media posts/newsletters to promote food safety awareness, educational opportunities, and resources in addition to developing robust organizational partnerships and connections throughout the Midwest region.

Title: **Increasing Peer-to-peer Training and Technical Capacity through a *Listeria* Environmental Monitoring Program for Spanish-speaking Produce Safety Staff**

Author(s): Jennifer McEntire, International Fresh Produce Association (PD transition TBD)
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The produce industry in the U.S. includes many bilingual and Spanish-speaking employees. However, produce safety training is often developed and delivered in English, creating language and cultural barriers to the successful application of the information that is taught. Few comprehensive Spanish-language resources exist in the area of *Listeria* management for the produce industry.

Through this grant, we are developing a *Listeria* produce safety training and education cohort program in Spanish, targeting small and medium size farms, produce packing and processing facilities, and other parts of the produce supply chain in the Southern United States. The overarching goal of this training is decreasing listeriosis illnesses related to consumption of fresh produce.

The project team included experts in the produce industry, *Listeria*, and training. Seven months into the 3-year grant, we have adapted and translated into Spanish 8 on-demand interactive modules, a participant guide, mentor/facilitator guide, and staff guide. A pre- and post-test has been created and an intern has been recruited to work on course updates and evaluation over the summer. Train the Trainer materials are currently in development. Over the course of the 2 months of asynchronous learning, 20 cohort participants will have 4 live virtual meetings with three mentors to discuss outstanding questions and begin to apply the technical content to their situations. Additionally, 5 participants from each of the three planned cohorts will receive additional training so they can serve as trainers for future courses.

An application form was developed to capture demographic information of prospective participants. The course pilot opportunity was promoted to nearly 1500 IFPA members with food safety roles in the Southern states. The Association of Food & Drug Officials (AFDO), Texas International Produce Association (TIPA), Food Safety CTS, and H-E-B promoted the training through their networks as well. The pilot cohort has just begun and outcomes will be shared in the future.

Title: **Diversified Farm FSMA Training Initiative (FSOP21)**

Author(s): **Karen McSwain**, Carolina Farm Stewardship Association
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Steve Warshawer, New Mexico Farmers Market Association

Diversified, sustainable, organic, beginning, and socially disadvantaged farmers growing produce for local and regional food markets are highly likely to be operating farms that are not covered by or are qualified exempt from the FSMA Produce Safety Rule (PSR). Among this audience, those that are covered often need significant support to gain an understanding of Good Agricultural Practices (GAPs) and may be unaware of the PSR. Together, through this Diversified Farm FSMA Training Initiative, the project partners are developing an alternative curriculum that is equivalent to the FDA-approved PSA standardized curriculum. The project partners, Carolina Farm Stewardship Association (CFSA), Community Alliance with Family Farmers (CAFF), National Sustainable Agriculture Coalition (NSAC), and New Mexico Farmers' Marketing Association (NMFMA), have been cooperating with the US Food and Drug Administration (FDA) in creating a PSA-equivalent GAP curriculum targeted to the needs of this audience since 2018. The Diversified Farm FSMA Training Initiative continues that collaboration by taking that curriculum and developing a full program for delivery to the target audience that is participatory and intended to be delivered on-farm. In 2022, a walk-through training was held with the project team, stakeholders of the National Farmers Union's Local Food System Collaborative, subject matter experts, USDA AMS, state regulators, and FDA. Revisions were made to the curriculum based on feedback from the walk-through, and it is currently being reviewed by the FDA for final approval. Once the curriculum receives FDA approval as an alternative curriculum, we will conduct pilot trainings on-farm in California, New Mexico, North Carolina, and South Carolina, create a Train the Trainer curriculum, establish a review and monitoring process for curriculum maintenance and distribution, and host an initial round of training for farmers.

Title: Local Produce Safety Initiative (FSOP19)

Author(s): Karen McSwain, Carolina Farm Stewardship Association
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The Local Produce Safety Initiative is a Collaborative Education and Training Project between 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 to develop and implement outreach and education on FSMA PSR regulations and Good Agricultural Practices specifically for historically underserved farmers and organic production systems. The objective of this project 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.

Through the end of 2022, we conducted 21 workshops for 467 participants on food safety and provided direct Food Safety Program and Plan Development assistance to 167 small-scale farms seeking GAP certification. Workshop titles have included 1) Principles of Fresh Produce Safety, 2) Navigating the GAP Audit, 3) Q&A Session with Lead Auditors in North and South Carolina, 4) The Science of COVID: What Makes COVID Different from Foodborne Illnesses, 5) On-Farm Best Practices in the Age of COVID, and 6) HGAP. We conducted 17 PSA workshops for 132 participants, two in Spanish. Workshop participants were predominately beginning farmers (83% n=195) and limited resource (59%), 38% of respondents identified as socially disadvantaged.

As a result of the workshops, over 50% of participants (n=195) said they intended to implement food safety practices on their farms, including training for workers on health and hygiene and food safety practices. 60% said they plan to address areas of potential contamination on the farm, and 41% said they plan to pursue GAP certification. Of the 167 growers who received GAP technical assistance, 55 received assistance with a food safety plan, and 36 successfully completed a GAP audit, thereby improving their access to additional markets.

Title: Tribal Produce Safety Training

**Author(s): Jeffrey Mears, Wisconsin Tribal Conservation Advisory Council,
Executive Director**

The Wisconsin Tribal Conservation Advisory Council (WTCAC) is partnering with the Great Lakes Indian Fish & Wildlife Commission (GLIFWC) and the 1994 Land Grant Lac Courte Oreilles Ojibwe College (LCOOC) to identify and address specific Produce Food Safety needs of our Historically Underserved Tribal growers with the goal to develop a culturally appropriate Tribal Produce Safety Training Series (TPST Series) model that delivers Produce Safety Alliance (PSA) Food Safety Train-the-Trainer Series while also addressing produce safety for wild harvested and foraged traditional Tribal foods.

WTCAC and project partners will complete TPST Series that are culturally-appropriate and customized to needs for Tribal producers.

On April 11 – 13, 2023, WTCAC presented the first Tribal Produce Safety Training and PSA Grower Certification class at the Lac Courte Oreilles Ojibwe University. The training included the 8-hour PSA Grower course, the GLIFWC Model Food Code, and training on participating in Farmers Markets.

WTCAC is a tribal organization directed by a Board of representatives from each of the 11 federally recognized Tribal Nations in Wisconsin. Tribes in Wisconsin are spread out over the northern half of the state and additional training courses are planned for June at the Ho-Chunk Nation and November at the Menominee Indian Tribe of Wisconsin.

Title: Sullivan County Food Safety 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. The objectives of the Sullivan County Food Safety Outreach Program for Sullivan, Delaware County, New York and Wayne County, Pennsylvania 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 Food Hub and Sullivan Fresh Program, and increase access to safe and nutritious food for low-income communities and decrease foodborne illnesses.

For the 2022 grant, we plan to continue with technical assistance to farmers with completion of their FSMA plans and farm food safety assessment. Workshop training will include PSA Certification, Writing a Farm Food Safety Plan, FSMA Health and Hygiene workshop, Organic Certification, Wholesale and Recordkeeping, and On-Farm Composting. We have also developed fact sheets and surveys for data gathering and establishing benchmarks.

Title: **Planting the Seeds: Teaching the Value of Food Safety to New and Beginning Farmers**

Author(s): **Meredith Melendez**, Rutgers The State University
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Jennifer Matthews, Rutgers The State University

The Rutgers on-farm food safety team recognizes the need for the development of a beginning farmer specific outreach program, which requires training programs and resources geared to this audience. According to the latest Agricultural Census (2017) there are 463 new and beginning farms in New Jersey with 98% of farms considered small (under \$350,000) or medium (\$350,000 to \$999,999) by the USDA. Of the 1995 produce farms in New Jersey 1,303 operations are not covered by the rule or are qualified exempt. The inclusion of small farms and beginning farmers in its outreach focus will allow the team to discuss risk prevention practices with new and beginning growers who have likely not benefited from traditional extension produce safety programming. Produce growers who are not yet covered by the Food Safety Modernization Act: Produce Safety Rule (FSMA PSR) and those that are qualified exempt will be provided with tools to develop food safety systems preparing them for compliance with the FSMA PSR. The target audience will participate in a full-day beginning farmer focused food safety risk reduction training, a hands-on food safety plan writing workshop, one-hour hot topic webinars, and have a one-on-one farm produce safety risk walk through with follow-up technical assistance. The use of these resources will foster the development of good habits associated with food safety culture at the start- positioning them for regulatory compliance when needed, regardless of their coverage by the FSMA Produce Safety Rule. A farm that has an informed food safety culture will be better able to meet their current market demands, pivot their markets when needed, communicate the quality of their product with their customers, and make plans for the growth of their operation.

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
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Many food safety issues in fisheries products (both wild caught and farmed) are associated with how seafood is handled during harvest and receiving. Temperature abuse after harvest can lead to scombrototoxin poisoning in species such as tuna and sardine, prolonged storage in ice can lead to the development of specific spoilage organisms (SSOs) that can produce biogenic amines, and poor good fishing vessel or aquaculture practices can lead to adulteration by filth, hazardous chemicals, and enteric pathogens such as *Salmonella* spp. Since seafood harvesters are exempt from having to develop a food safety plan, it is critical that receivers at processing plants are able to recognize and communicate harvester best practices with regard to food safety and sanitation. The objective of this project, therefore, was to increase the knowledge base of food safety, sanitation and quality principles of those individuals who have frequent interaction with seafood harvesters.

Meetings were held with processors to prioritize topics for the workshop agenda. Four one-day workshops were held in Astoria, OR, Westport, WA, and Seattle, WA. Course assessments were utilized to refine and improve curricula. Virtual attendance using Meeting OWL Pro technology (OWL Labs) was made available for the presentation portion of the last workshop. This hybrid format enabled 47 participants to join virtually. A fifth hybrid workshop is being planned. Total attendees targeted to be supported by the grant: 30. Total attendees supported by the grant to date: 70. The workshop pre- knowledge assessment survey scores were 37%, 44%, and 45%, respectively for the trainings in Astoria, Westport, and Seattle. The post-knowledge assessment survey score for Astoria was 56%. However, instructors were not able to cover all material. As a result, the course curricula and agenda were modified, and post-survey scores for Westport and Seattle were 76% and 81%, respectively. All trainings demonstrated significant knowledge gained about good fishing vessel practices, basic food safety and sanitation. This was a specific goal of this project. Attendee overall assessment of the workshops was 4.63 (5-Excellent, 4-Good, 3-Fair, 2-Below Average, 1-Poor). Curricula materials, when finalized, will be shared electronically with all attendees and made available through the Seafood Network Information Center's website (seafood.oregonstate.edu).

Title: **Utilizing On-farm Inspectional and Educational Observations when Developing a Tailored Approach to Regional Produce Safety Education**

Author(s): **Elizabeth Newbold**, University of Vermont
Christopher Callahan, University of Vermont
Sean Fogarty, University of Vermont
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Ananda Fraser, RI Department of Environmental Management – Division of Agriculture

This integrated project serves a critical need in our 12-state northeast region to bring together researchers, regulators, and educators to tailor food safety education and outreach materials to address Produce Safety Rule (PSR) non-compliance and misunderstandings observed during inspectional and educational on-farm visits. This project leverages the Northeast Center to Advance Food Safety's (NECAFS) existing programming and adds new and novel collaborative work to develop tailored educational material to address regional noncompliance and misunderstandings seen on farms. To do this new work, first, the project team will compile and prioritize on-farm inspectional and educational noncompliance and misunderstanding observations from across the region. Then, NECAFS will host and add a third day to our existing NECAFS Annual Conference and Meeting where the produce safety workgroup will discuss, and articulate tailored educational material needed to address noncompliance priority issues observed during inspectional and educational visits. Finally, these educational materials will be developed and shared through regional educators, regulators, and other Regional Centers. On-farm observations are a critical perspective not currently emphasized in determining educational and outreach material in furtherance of growers' compliance with the Food Safety Modernization Act's Produce Safety Rule.

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

Author(s): Elizabeth Newbold, University of Vermont
Christopher Callahan, University of Vermont
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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: **Summarizing and Extending Information from Existing Produce Safety Research**

Author(s): **Elizabeth Newbold**, University of Vermont
Lisa McKeag, University of Massachusetts
Robert Hadad, Cornell University
Anna Loewald, University of Vermont

There is a significant amount of published produce safety research available, however, that collective information is not summarized in an effective way to make it easily useable by educators, technical service providers, inspectors, and growers. The members of the Northeast Center to Advance Food Safety identified the need to share existing research in an approachable way to increase fundamental knowledge and inform on-farm decision making. To address this need, the project team will conduct literature reviews of existing produce safety research and then summarize that into FAQ factsheets, providing a direct benefit to the produce safety community leading to knowledge gain and implementation of food safety practices. Literature reviews will be completed to understand existing research on the following topics: dropped produce, assessment of wildlife contamination, risks associated with wash water, water system inspections, and risks associated with human personal possessions. One review is complete and “Food Safety Risks of Harvesting Dropped and Drooping Produce: A Review” was published in the Journal of Food Protection. <https://doi.org/10.4315/JFP-21-369> The second review of animal contamination on raw agricultural commodities is currently underway.

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
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Through a 2016 NIFA Food Safety Outreach project and other activities, Kansas State University, University of Missouri, and Lincoln University have been working together on produce safety outreach related to the Food Safety Modernization Act (FSMA) and have identified water quality as a significant issue. The purpose of this project (funded in 2019 and ending August 2023) is to improve the safety of produce grown in Kansas and Missouri and improve market access for small-scale Kansas and Missouri growers through increased FSMA compliance. Accordingly, we are implementing the following activities: 1) Developed and administered a survey to 101 Kansas and Missouri produce growers to learn more about their knowledge and current practices related to water quality (published in Food Protection Trends (FPT) in November 2022); 2) Conducted year-long sampling to implement a pilot study to trace sources of generic *Escherichia coli* found in six ponds and one cistern in Kansas and Missouri used for produce irrigation (accepted for publication in FPT); 3) Established a protocol to validate effectiveness of controlled treatment methods for surface water for post-harvest use (published in *Water* journal: December 2022) and working towards establishing demonstration systems to educate growers on this topic; 4) We are developing materials and will translate them to help growers better understand the importance of, and the procedures for, monitoring and improving water quality in produce (available from: www.ksre.k-state.edu/foodsafety/produce/index.html); and 5) We continue to provide cost-free water testing to Kansas and Missouri produce growers to enhance understanding of their water quality (results published in FPT: May 2022). We are engaging broad audiences in both states as well as the North Central Regional FSMA training center and the Produce Safety Alliance to improve knowledge and decision-making ability for KS and MO produce growers based on their water quality and risk management options.

Title: Multi-state Initiative to Support Organic Food Processors with Food Safety Compliance

Author(s): Jessica Parr, CCOF Foundation
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Stephanie Smith, Washington State University
Scott Rice, Washington State Department of Agriculture

Project partners identified, through regular contact with small- to medium-scale organic processors, the need for low-cost, introductory-level trainings about food safety regulations and best practices that highlight the overlap and distinctions of certified organic and Food Safety Modernization Act (FSMA) regulations and record-keeping.

The long-term goal of this project is to create a culture of informed food safety decision making, consistent compliance, and a more complete understanding of the FSMA in California, Washington, and Oregon's small- and mid- scale organic food processor community. Specifically, the project aims to assist these processors in understanding and complying with FSMA requirements and to increase their knowledge and implementation of Preventive Controls for Human Food (PCHF) and current Good Manufacturing Practices (cGMPs). Project partners provided both online and in-person trainings tailored to the target audience. Webinars were recorded and made available online.

A total of 581 processors were served by this project. 13 webinars were attended by a total of 528 people, one online Produce Safety grower training was attended by 28 people, and one in-person Preventive Controls Qualified Individual training was attended by 25 people. 85% of attendees increased their understanding of food safety regulations and practices, and 80% of attendees intend to implement strategies learned in the trainings. 12 out of 13 webinars were recorded and posted to the CCOF YouTube channel. These webinars have collectively been viewed 2,573 times.

Webinars proved an effective means of delivering information to the target audience and provided an accessible, COVID-safe forum for processor participation across a broad region (an average of 40 participants per webinar). Posting webinar recordings online created opportunities for additional learning; the "Cottage Food Laws in CA and WA" webinar has been viewed over 700 times.

Title: **Overcoming Food Safety Educational Barriers within NY Plain Communities**

Author(s): **Lindsey Pashow**, Cornell Cooperative Extension Harvest New York, Cornell University
Elisabeth Hodgdon, Cornell Cooperative Extension Eastern New York Commercial Horticulture Program, Cornell University
Robert Hadad, Cornell Cooperative Extension Cornell Vegetable Program, Cornell University

New York State (NYS) is home to the fastest growing Plain population in the country. Around the state, Plain populations consist of many different settlements of Amish and conservative Mennonites that differ in their acceptance of technology, customs, and agricultural practices. Since each community is different, educational outreach must be personalized, but one common trait is that it requires face-to-face support. Individual farm visits, small grower workshops, and twilight meetings are essential for extension to build long-term relationships with Plain growers.

One extension program that has taken longer for produce growers in Plain communities to accept is food safety. Over the years, Cornell Cooperative Extension educators have worked with communities to host food safety trainings such as Produce Safety Alliance Grower Training Courses and Good Agricultural Practices. However, the majority of growers do not create food safety plans or standard operating procedures (SOP's). Many Plain growers in NYS do not prioritize food safety practices due to lack of buyer requirements, misunderstanding of regulatory compliance, and misconceptions surrounding foodborne illness.

This project focuses on adjusting training methods to better fit the communities' abilities and acceptance for everyday food safety practices on their farms. One such way is creating personalized simple SOPs for the different food safety practices while using culturally-sensitive terminology. We propose a series of farm and auction visits, twilight meetings, and small group meetings to work with Plain growers to identify critical areas of food safety improvement and to develop simple SOP's that result in safer produce production.

Title: Increasing Accessibility of Food Safety Resources for Farmers and Small Food Processors in Northwest New Mexico

Author(s): Lorenzo Reyes, San Juan College
Jacqueline Montoya, San Juan College

Currently, the San Juan College (SJC) Harvest Food Hub works directly with farmers, ranchers, and food entrepreneurs to provide one-on-one mentorship as well as internet access for small to mid-sized producers, who often do not have access at their rural farms. From our work with this audience, we identified a need for farm food safety training as well as safety and production training for those who create value-added products from local ingredients.

Our goal is to be a central resource and training hub for food businesses to increase understanding and compliance with local, state and federal food safety requirements including the Food Safety Modernization Act.

We are working with many different organizations (New Mexico State University, New Mexico Farmers Marketing Association, Northwest New Mexico Grower's Market Alliance and Small Business Development Center) to provide many methods of training such as tier one and two farm safety trainings and managers' food protection certificates along with other food safety and production trainings to the producers in the Northwest region of New Mexico. We are also providing materials in both Spanish and Navajo languages.

These trainings have and continue to provide valuable information and tools to the producers/farmers that are essential for their business's success. Through our efforts, we have been able to provide over 55 producers with valuable trainings that have directly resulted in growth of their businesses.

Title: **Building Capacity: Customized Food Safety Education and Outreach in Rhode Island**

Author(s): **Nicole Richard**, University of Rhode Island
Lori Pivarnik, University of Rhode Island
Elizabeth Kass, University of Rhode Island

Support is needed for processors to comply with the Food Safety Modernization Act (FSMA) Preventive Controls for Human Food (PCHF) regulation, especially the small and medium-sized operations. The Food Safety Preventive Controls Alliance (FSPCA) developed the standardized PCHF curriculum to teach the regulatory requirements of the PCHF rule, however, it only provides simplified approaches to regulatory compliance. Therefore, there is opportunity for the development of complementary training and outreach to enhance compliance with the PCHF rule. The long-term goal of this project is to build the capacity of the Rhode Island food manufacturers network to comply with FSMA regulatory requirements for food safety training, implement best food safety practices and strengthen the food safety system. This will be accomplished by the following objectives:

1. Conduct an assessment to understand the food safety education and outreach needs of RI food manufacturers subject to the PCHF rule.
2. Customize, develop, and/or expand upon food safety training materials and provide education and outreach opportunities for RI food manufacturers in the delivery format preferred (informed by the needs assessment).
3. Evaluate the impact of the training program for continuity and implement a sustainable education and outreach program.

The needs assessment, which is currently being developed, will produce a qualitative and quantitative characterization of the food safety training and outreach needs of the RI food manufacturing industry to comply with the FSMA PCHF regulation. This information will guide the education and outreach opportunities provided to the RI food manufacturing industry, so they are better equipped to meet regulatory compliance.

Title: **Developing an Engaging Produce Safety Add-on Training for Soilless Growing Operations**

Author(s): **Camila Rodrigues**, Auburn University
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Controlled-environment agriculture systems, including indoor, vertical farms, and soilless systems such as hydroponic and aquaponic operations, have been suggested as an engineered solution for increase productivity per area. However, few resources exist to meet the unique food safety needs of these produce growing operations. The overarching goal of this project is to develop specialized curriculum and an outreach program that will prepare hydroponic and aquaponic growers to meet food safety standards. The specific objectives of this project are to 1) conduct team capacity building and a comprehensive needs assessment survey to educate indoor agriculture growers on food safety practices; 2) develop food safety curricula and supplemental educational materials detailing best practices for food safety for indoor growers, aligning with the current food safety requirements; 3) conduct Train-the-Trainer workshops to train extension and service providers in providing training for indoor growing operations and deliver grower training for growers; and 4) and evaluate the effectiveness of the program. A food safety needs assessment survey has been developed and is being currently distributed nationwide to collect information regarding food safety practices and knowledge gaps from indoor growing operations. The project team has conducted three on-site tours to indoor operations with graduate students and extension agents to build team capacity. In addition, the project has generated one extension publication highlighting food safety aspects of greenhouse vegetable production. Results from the needs assessment survey and on-site visits will be used to guide the development of the specialized food safety curriculum for indoor agriculture operations.

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

Author(s): **Camila Rodrigues**, Auburn University
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The Experiential Learning Opportunities for Limited Resource Growers through Mobile Farm Innovation project aimed to address the challenges faced by socially disadvantaged, limited resource, minority growers in achieving food safety and conservation goals while maintaining financial viability. The project sought to develop customized food safety training for growers in Mississippi, Alabama, and Georgia, which focuses on experiential learning and face-to-face technological support. The project's objectives include developing three Mobile Farm Innovation Units equipped with multiple experiential, visual, and technological training aides, developing a curriculum, providing outreach to socially disadvantaged growers, and evaluating the program's effectiveness. To date, the project has generated 9 factsheets and activity facilitator guides, 8 screencasts, 4 videos, and facilitated 7 events, resulting in improved knowledge and confidence in implementing produce safety practices among attendees. Additionally, farmers reported intent to implement practices on the farm (i.e., on-farm handwashing, cleaning/sanitation, developing a farm map) except for implementing on-farm cold storage. The project was also able to provide 2 additional trailers to Auburn University and Mississippi State University. The focus groups were held in Shannon, Mississippi, and Selma, Alabama. Farmers' experiences varied widely, with some still lacking access to USDA resources, impacting food safety and farm viability. Socially disadvantaged farmers require technical assistance accessing resources, including partnerships with organizations for financial resources. Equipment sharing could improve produce safety, facilitate cost reduction, and expand markets through GroupGAP certification. Educators must address farmers' needs, including exclusion fencing for hog control. Service providers must help less internet-savvy farmers access resources.

Title: **Immersive Food Safety Training to Support Technical Assistance for Small and Mid-sized Farmers**

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This project developed and is currently disseminating online courses on pre/post-harvest water sampling and testing and soil amendments. Further, two 360 virtual tours of a small diversified produce operation and a farmers' market were developed to enhance in-person food safety trainings already offered by Virginia Tech and NCSU. These materials aim to provide food safety extension specialists and family consumer science (FCS) agents with training materials that are engaging, innovative, interactive, and address the needs of small and mid-sized operations. The curriculum is aligned with FSMA rules, leveraged PSA materials, and was developed under the guidance of a steering committee composed of representatives of small and mid-sized producers and extension specialists working directly with them. The online courses on water sampling and testing and soil amendments are available in English and Spanish via NCSU's website and the Food Safety Clearinghouse. The courses take about 30 minutes to complete and cover important definitions, different water sources and their risks, microbial testing, sampling frequency, and methods. The soil amendments course explains the different categories of soil amendments, focusing on raw manure and composting, risks, and best practices to reduce the microbial risk. The course includes a section on working with suppliers for those buying soil amendments. Universities and the Regional Centers have been key in disseminating the courses. We estimate that about 50 individuals completed the online courses. 27% provided voluntary feedback via online survey and were mostly positive. The virtual tours were used to train 36 FCS and other extension agents and 19 producers in NC as part of VT and NCSU in person trainings and overall have been well received and generated interest in the technology. The pandemic caused significant delays but we hope to be back on schedule and training a higher number of producers in the next year.

Title: Collaborative Food Safety Education and Training for the Deaf and Hard of Hearing Farmers in the Pacific Northwest

Author(s): Dojin Ryu, University of Idaho
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Joelynn Ball, Idaho Educational Services for the Deaf and the Blind
Stephanie Smith, Washington State University

The Deaf and hard of hearing farmers often operate small and very-small farms and have not been able to access the necessary training to comply with the Food Safety Modernization Act's (FSMA) Produce Safety Rule (PSR) due to the lack of adequate training programs designed for this underserved population as well as insufficient funding and outreach efforts. Hence, the long-term goal of this project is to ensure food safety through education and training of growers, particularly the Deaf and hard of hearing farmers in the Pacific Northwest. The main objective of this project is to develop and implement a customized produce safety education program for the hard-to-reach and socially disadvantaged target population, the Deaf and hard of hearing farmers in the Pacific Northwest. Specific objectives of this study include: (1) development of a culturally sensitive education program on FSMA with emphasis on the introduction to compliance with the PSR using American Sign Language (ASL); (2) delivery of training workshops online and in-person based upon an instructional approach that encompasses the Understanding, Implementation, and Support [UIS] model for the Deaf and hard of hearing learners; and (3) program evaluation and dissemination of the training program nationwide for maximum impact and sustainable delivery. A total of 90 Deaf and hard of hearing farmers from the Pacific Northwest (Idaho, Oregon, and Washington) will be recruited and trained in collaboration with partner organizations, including Schools for the Deaf in the region.

Title: **Southern Regional Center for Food Safety Training, Outreach and Lead Regional Coordination Center**

Author(s): **Keith R. Schneider**, University of Florida
Michelle Danyluk, University of Florida
Renée Goodrich Schneider, University of Florida
Amy Harder, University of Florida

Compliance with the Food Safety Modernization Act's Produce Safety Rule (PS) 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 Center for FSMA Training (SC) is a consortium of 22 institutions aimed at enhancing produce safety in 13 southern states and two territories through a variety of educational means, including conducting and evaluating standardized courses (Produce Safety Alliance (PSA) and Food Safety Preventive Controls Alliance (SPCA) Preventive Controls Qualified Individual (PCQI)) targeting the PS and PCHF.

The Lead Regional Coordination Center operates to promote produce safety, communication, and collaboration between the four regional centers at a national level. The LRCC hosted the Food Safety Outreach Program's National Project Directors Meeting in Orlando, FL on May 25-26, 2022. A second national meeting is scheduled for May 31-June 1, 2023 in Tampa, FL.

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

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Veerachandra Yemmireddy, University of Kentucky
Achyut Adhikari, Louisiana State University
Juan Silva, Mississippi State University
Lynette Johnson, North Carolina State University
Kim Butz, Carolina Farm Stewardship Association
Ravi Jadeja, Oklahoma State University
Lynette Orellana, University of Puerto Rico at Mayaguez
Chad Carter, Clemson University
Annette Wszelaki, University of Tennessee
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Tamra Tolen, Prairie View A&M University
Laura Strawn, Virginia Tech University
Stasia Greenwalt, Local Food Hub

The overall scope of the Lead Regional Coordination Center (LRCC) and Southern Regional Center (SC) is to continue to build a collaborative infrastructure in the Southern US to support Food Safety Modernization Act (FSMA) compliant training, education, extension, and outreach. The SC includes land-grant institutions and partners in AL, AR, FL, GA, KY, LA, MS, NC, OK, PR, SC, TN, TX, and VA. It will lead, manage and coordinate regional assistance programs targeted at owners and operators of small and medium-sized farms, beginning farmers, socially disadvantaged farmers, small food processors, and others affected by FSMA requirements. The SC will leverage established partnerships with stakeholder groups including state and local regulators, and community-based and non-governmental organizations to maximize training effectiveness and delivery opportunities. Additionally, the LRCC will work to coordinate and facilitate activities and communication among the four regional centers (SC, WRC, NECAFS, and NC).

Title: **Food Safety Outreach for Emerging New American and Beginner Farmers in New Hampshire**

Author(s): **Jameson Small**, Organization for Refugee and Immigrant Success
Anthony Munene, Organization for Refugee and Immigrant Success

The Organization for Refugee and Immigrant Success (ORIS), an ethnic community-based nonprofit organization located in Manchester and Concord, New Hampshire, has operated an incubator farming program with resettled refugee and other immigrant beginner farmers since 2008 and launched a regional food hub in 2020. The FSOP project leverages those technical assistance experiences to deliver linguistically and culturally appropriate food safety education and outreach with these target populations to result in AFDO certification for an estimated 50 producers. The goal is for ORIS staff to attend the PSA Grower Training, Train-the-Trainer and Lead Trainer courses, work with Cornell to appropriately customize and translate key Grower Training content into Swahili and Kinyarwanda, and to deliver said training to the target farmers. Additionally, ORIS staff will deliver 1,2000 annual hours of on-farm food safety technical assistance with New American farmers who complete the Grower Training. Particular emphasis is being placed on the development of operation-specific food safety plans and supporting SOPs for each participating farmer and farm location. Major outcomes include 8 ORIS staff/interpreters complete up to the Lead Trainer status; 50 target farmers complete the PSA Grower Training curriculum and receive an AFDO certificate and 95% of project participants who complete the PSA Grower Training will complete refresher courses approximately 6 months following AFDO certification.

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

Author(s): Katherine Un, National Young Farmers Coalition

Beginning farmers recognize the importance of having food safety practices for a healthy and successful farm business but often lack access to critical business resources, capital to invest in upfront food safety infrastructure, and an understanding of regulations' applicability to their businesses. This project aimed to support beginning farmers in successfully building and scaling their farm operations by providing them with the practical training and resources they need to effectively, efficiently, and confidently invest in the processes and infrastructure that will enable them to reduce food safety risks. Launched in 2019, the original project consisted of a series of pre-growing season farm tours and training. However, the onset of the COVID-19 pandemic disrupted our ability to offer in-person training at a time when producers needed safety support more than ever.

In response, we significantly pivoted the project to a virtual Food Safety Fellowship, aimed at expanding our base of food safety subject matter experts. Farmers benefit from spaces where they're learning from each other, and this project was a vehicle for that, building power among those most underrepresented in agriculture, especially young farmers and farmers of color. Eleven farmer fellows spent nine months (March 2021 - December 2021) enriching and honing their food safety comprehension and skills to be applied directly to their farming operations and to become on-farm food safety leaders and resources to their farming communities. Post program, fellows facilitated virtual food safety courses such as Produce Safety Alliance growers trainings, food safety plan writing workshops. Regionally, fellows served as mentors, tailoring their assistance to an analysis of how these rules and practices differ based on local factors. Our fellowship model successfully met the initial project deliverables, and is an approach our coalition continues to replicate and refine for other agricultural issue areas (e.g. climate, water equity).

Title: **Engaging Asian American and Pacific Islander (AAPI) Grower Educational Needs for Safe Fruit & Vegetable Production in Hawai'i and California**

Authors: **Sharon Wages**, University of Hawai'i Manoa
Amjad Ahmad, University of Hawai'i Manoa
Joshua Silva, University of Hawai'i Manoa
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Sara Garcia, University of California at Davis

Nationally, Asian American and Pacific Islander (AAPI) growers constitute 28,000 growers, earning \$7.5 billion in annual produce sales; but they can have difficulty in accessing critical food safety information like the Food Safety Modernization Act's Produce Safety Rule (FSMA-PSR) due to limited English proficiency. This project aims to provide FSMA-PSR resources to socially-disadvantaged AAPI fruit and vegetable growers in Hawaii and California.

We will translate the Western Institute for Food Safety and Security (WIFSS) supplementary FSMA-PSR e-course and associated resources into Ilocano and Mandarin for AAPI growers in Hawaii and California. We will identify and address gaps in course curricula and content by obtaining feedback from stakeholders before migrating the FSMA-PSR online course and resources to a dedicated website that can support demand and user traffic. Evaluation will include conducting FSMA-PSR outreach to AAPI growers and stakeholders, which includes PSA grower trainings and workshops showcasing the newly translated e-course website and materials.

To date, the project has translated the necessary text into Mandarin and will be able to begin with formatting. We will then proceed with Ilocano translations.

Title: **Farm Food Safety Training for Local and Immigrant Crop Producers in Hawai'i**

Authors: **Sharon Wages**, University of Hawai'i Manoa
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In Hawai'i, the agricultural workforce is largely made up of local and immigrant crop producers, whom many are Limited English Proficient (LEP). Over 25% of Hawai'i's population speaks a language other than English at home. Of those languages, the top three are Ilocano, Tagalog, and Japanese. The University of Hawai'i Manoa College of Tropical Agriculture and Human Resources Cooperative Extension works directly with the agricultural industry in Hawai'i, and Ilocano has been identified as one of the major languages spoken by edible crop producers.

Offering educational materials and the required curricula in the appropriate language, Ilocano, will enable Hawai'i edible crop producers and their businesses to meet regulations, operate legally, and maintain market supply.

To date, we have translated the PSA grower training manual into Ilocano using a commercial company, and the manual is now under secondary review by a native-speaking Ilocano that is familiar with agriculture in Hawai'i and has completed the PSA grower training course. After the secondary review is completed, we will work with PSA to make sure formatting is acceptable and begin the process of material review by peer groups.

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

Author(s): Evelyn Watts, Louisiana State University AgCenter
Melissa Cater, Louisiana State University AgCenter
Greg Richard, Louisiana Department of Health

New trends are driving businesses to cross over from retail to manufacturing, blurring the lines between industries. Spanning across both areas enables limitless potential and growth of food businesses, but also makes it difficult to establish food safety programs to meet the requirements necessary to succeed. The overall goal of the proposed project is to assist existing crossover businesses or businesses who are considering crossing over the lines between retail and manufacturing. We will help them identify applicable food safety regulations and provide customized educational modules that will allow them to fulfill regulatory requirements. A Questionnaire was designed to assess the food safety education needs of food businesses and sanitarians in the state of Louisiana. The survey was conducted by state sanitarians. Data were analyzed using descriptive statistics. eLearning modules were developed based on needs assessment. Modules will be launched in May of 2023. Needs assessment showed most variance processes included reduced oxygen packaging (ROP) (40%), using of additives such as vinegar as a method of preservation (21%), and smoking food as a method of preservation (20%). ROP of raw single ingredient (26%), hot smoking (88%), and sushi (25%) rated the most popular, within each category, respectively. Nine eLearning modules were developed by the LSU AgCenter, including basic food safety definitions, food safety hazards, good practices at retail food establishments, specialized processing methods, seven principles of HACCP, ROP HACCP, smoked meat, and sushi. Modules will be launched in May of 2023. Impacts of training will be collected during the remainder of the project. The educational modules will be implemented through Louisiana Department of Health (LDH) sanitarians. The impact of the project is expected to reach statewide.

Title: FSMA and Business Development Training to Underserved Small Food & Beverage Entrepreneurs and Future Capacity Building

**Authors: Wendy White, Georgia Tech GaMEP
Brandy Nagel, Georgia Tech GaMEP**

There is a strong need for targeted, food safety (FSMA) and business development training for small food producers across underserved communities in Georgia and Puerto Rico where the number of food start-up businesses has increased since the pandemic. This Collaborative Education and Training project will form a multi-state collaboration between the Georgia Institute of Technology (PD - Wendy White and Co-PD - Brandy Nagel), Fort Valley State University (Subaward PI - Niki Whitley), and Puerto Rico Manufacturing Extension, Inc. (Subaward PI – Ilia Cordoliani), leveraging existing outreach relationships to traditionally socially-disadvantaged and insular communities. An introductory food safety (FSMA) and business development curriculum will be developed, and training deployed to small food processors across these states in English and Spanish. This will be paired with capacity building efforts in the form of Train-The-Trainer (TTT) classes to produce competent trainers in GA and PR who will continue to deliver this training far past the project parameters. The training effectiveness will be evaluated, and impacts collected for both the entrepreneurial and TTT participants. Project materials (English and Spanish) will be shared with the project partners, the Southern Regional Center, USDA NIFA, and recordings shared with the public through several digital channels. The ultimate goal is to generate the training and trainers needed to provide underserved food entrepreneurs with the knowledge to produce safe foods, understand their food safety regulatory compliance responsibilities, and have the basic business development skills needed to succeed and thrive in today's competitive marketplace.

Title **Closing the GAPs: Food Safety Education and Outreach to Underserved Communities in the Lower Rio Grande Valley**

Author(s): **Veerachandra Yemmireddy**, University of Texas Rio Grande Valley
Colin Cain, University of Texas Rio Grande Valley

Underserved Hispanic fresh produce growers in the Lower Rio Grande Valley (LRGV) region of South Texas are in dire need of food safety educational programs to help manage food safety risks and improve their market access. These growers face significant obstacles in navigating through current regulatory and buyer driven market requirements in addressing local food safety issues and are currently underserved by existing food safety programs. The purpose of this project is to provide bilingual produce safety education and outreach to Hispanic growers in the LRGV and build training capacity to identify and address their food safety educational needs. The University of Texas Rio Grande Valley in partnership with multiple CBOs and NGOs in the region has identified local needs and developing customized bilingual produce safety training workshops with hands-on activities consistent with current FSMA guidelines. Educational materials consisting of 7 modules on different pre- and postharvest food topics targeting the needs of local growers were developed. The materials are in the process of translating into Spanish versions. Feedback and comments on the developed curriculum were received from the advisory board consisting of representatives from collaborating partners and farmers. A total of 6 students from agriculture and related disciplines attended PSA grower training and are trained to support project activities. Project external evaluator in collaboration with project team and grower partners developed an evaluation rubric to develop surveys and evaluate the impact of the program. Outreach activities were conducted by presenting at 2022 Texas Farmers and Ranchers Annual Meeting and series of focused group meetings with local farmers. After successful deployment of training workshops, the project team along with cadre of developed trainers will provide technical assistance for growers to earn industry recognized credentials. We anticipate 40% of attendees will develop farm food safety plans, 25% implement risk mitigation practices and 10% will be able to obtain GAP and GHP certifications to improve their market access.

Title: **College of the Sequoias Delivers FSMA Training for Small and Mid-sized Farms and Processors**

Author(s): **Jorge Zegarra**, College of the Sequoias
Laurel Garver, College of the Sequoias
Frank Nunez, State Center Community College District

This collaborative project between the College of the Sequoias Community College District, the State Center Community College District as well as the Central Valley Food Safety Committee is enabling small and mid-sized farms, beginning farmers, socially disadvantaged farmers, small processors, and small fresh fruit and vegetable merchant wholesalers to enhance their competitiveness by ensuring compliance to the Food Safety Modernization Act (FSMA). The aim is to grow training, education, outreach and coordination efforts for California's Central Valley farmers with the adoption of FSMA requirements by providing local and affordable food safety trainings/meetings.

Objectives of the project include coordinating and preparing 50 specialty crop producers for FSMA produce safety inspections and to deliver training to at least 1,100 individuals in at least 55 training sessions of the following FSMA-related topics: Produce Safety Rule grower training, Good Agricultural Practices, Hazard Analysis Critical Control Points, Foreign Supplier Verification Program, Preventive Controls for Human Foods and Beyond Basics Produce Safety. The project will measure success by the number of farmers prepared for produce safety inspections, trainings offered, number of participants trained and number of participants who increased knowledge of food safety skills. This FSOP Project has been extended through August 31, 2023 to allow the State Center Community College District to complete their portion of the project.

Despite multiple attempts to contract with a consultant/trainer to conduct produce safety inspections, in the end, the farms chose not to participate. Farmers did not want to disclose any information about their farms or operations in the inspection. The project scope is being revised to shift the funds to complete more produce safety trainings instead. Our team has delivered 69 trainings, training 1,092 participants in FSMA-related training. This number will increase, as State Center Community College District are still executing the project. Through these trainings, 75% of trainees have increased their food safety knowledge. Additionally, work with the Central Valley Food Safety Committee has resulted in six food safety industry luncheons; bringing Bob Whitaker, Sonia Salas, Thais Ramos, Veronica Ramos, George Nikolich, and Ed Fifield to the Central Valley as guest speakers on food safety topics.

Additional Information

Complimentary Internet Access

To access Internet in the meeting center, follow these instructions on your device:

1. Connect to the network "Hyatt-Meeting"
2. You will be directed to the splash page where you will enter the code: USDAOutreach
3. Click on "I agree to the terms of use" if prompted to
4. Click on "Log In"

Name Badge

Your name badge serves as your admission to networking functions, so be sure to wear it throughout the meeting.

Morning Refreshments, Breaks & Lunches

Networking functions will be held in the Sandhill Crane Room. Early morning refreshments (coffee, tea, decaf, juices, fruit, cereals, and light bakery items) will be available from 7:30am–8:30am. Mid-morning and afternoon breaks provide complimentary beverages and light snacks. A full, 90-minute lunchtime on Wednesday allows ample time for attendees to network and connect with colleagues, and a Grab-n-Go boxed lunch is provided for your departure on Thursday.

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Please mute your cell phones, tablets, and mobile devices while in all meeting rooms. Also, please mute the sound on your laptops. Please respect presenters' wishes not to share certain sensitive data on social media. Please do not photograph or share on social media.

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If you lose an article, first check with meeting registration staff. If the lost article(s) has not been turned in, check with the hotel front desk staff.

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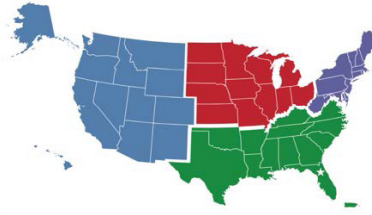
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All meeting participants must agree to follow our Code of Conduct when they register. We welcome you to join, sustain, foster, and help grow our inclusive and supportive environment. The full code of conduct can be found on our webpage here: conference.ifas.ufl.edu/code-conduct.html



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