**Title:** **On-Farm Food Safety Training for Farm Workers and Underserved Farmers Covering FSMA PSR and Gaps Requirement**

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The objective of this project is to deliver on-farm food safety training to small and mid-sized farms, as well as underserved farmers in Louisiana and Florida. To improve learning outcomes and promote the adoption of food safety practices, the project transitions from traditional PowerPoint-based presentations to more interactive, hands-on training formats. The program offers short (3-hour) on-farm training sessions for farm workers, focusing on Good Agricultural Practices (GAPs), Good Handling Practices (GHPs), worker health and hygiene, sanitation, risk assessment, and key requirements of the Food Safety Modernization Act (FSMA) Produce Safety Rule (PSR). Training is conducted using visual aids such as posters and flip charts to enhance engagement and retention. To support growers' operational needs, the project is developing a suite of practical tools and resources, including educational video series, risk assessment tools, standard operating procedure (SOP) templates, factsheets, and recordkeeping logs. The risk assessment tools will enable growers to evaluate their current operations, identify potential food safety hazards, assess existing practices, and pinpoint areas requiring improvement in compliance with GAPs, GHPs, and FSMA PSR. The project has also initiated on-site audits to support the implementation of food safety measures. Given the significant number of Spanish-speaking farmers and farmworkers in the target regions, all training materials and sessions are being offered in both English and Spanish. The interactive flip chart is expected to be finalized and published by early 2026 and will be made available through the websites of the collaborating institutions.

**Title:** **De-Mystifying FSMA: Creating a Food Safety Education and Training Program to Increase Market Access for Black Producers and Chefs in the Mid-Atlantic US**

**Author(s):** **Aitalohi Amaize,** OurSpace World
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The Food Safety Modernization Act (FSMA) enables the FDA to better protect public health by strengthening the food safety system. It creates more and better opportunities for the FDA to focus on preventing food safety problems rather than relying primarily on reacting to problems after they occur. From a farming perspective, the changes enacted and required by FSMA have created some challenges, especially for smaller farmers and farms operated by historically under-served populations. The resource disparities between small farming operations and large operations can be quite vast, and some of the changes in requirements enacted by FSMA to access robust, diverse, and lucrative end-markets require financial resources and outlays that are typically beyond the reach or feasibility of many small farmers.

Creating no and low-cost opportunities to attain food safety education training and access technological platforms that open up additional markets for increased revenue and profits are crucial to leveling the FSMA playing field for small farmers. It has been proven that increasing food safety educational opportunities and developing a food safety plan(s) can decrease the disparate impacts of FSMA compliance costs between large farmers and small farmers by increasing market access for food safety trained farms and boosting their revenue generation.

OurSpace World and Good Earth Therapy's project - De-Mystifying FSMA: Creating a Food Safety Education and Training Program to Increase Market Access for Black Producers and Chefs in the Mid-Atlantic US will offer training, education, and access to a track and trace technology platform that seeks to reduce these disparities and ensure the profitability and success of small farming operations in the DMV-area and - with scale - the Mid-Atlantic region and country at large. The project team will meet the goals of the Food Safety Outreach Program by creating (1) chef-led food safety training and education processes for farmers and (2) build and implement technology that helps small farmers adhere to section 204 of the Food Safety Modernization Act (FSMA), the Food Traceability Final Rule, by tracking and tracing produce from seed to table. These efforts will be accomplished through a multi-state effort in the DC, Maryland, Virginia (DMV) region of the United States, working with a network of all-Black chefs, farmers, and technology/service providers.

To date, the project team has implemented two successful ServSafe cohorts, providing a 50/50 upfront cost share and scholarships to decrease barriers to access (Goal 1). We have equipped a total of 28 farmers and food producers with food safety training and increased awareness in marketing, business opportunities and potential commercial kitchen space access with 2 more cohorts slated for implementation in 2025. We have also made tremendous headway in our efforts to build a track and trace app in order for small scale farmers to systematically capture wholesale and institutional market sale data (Goal 2). With our partnership with KRPM (software development company), the preliminary “track and trace” app requirements have been confirmed with input from farmers to initiate the development process for end-user engagement and end-user testing that will take place in 2025.

**Title:** **Food Safety Training and Technical Assistance for Cottage Food and Home Bakery Operations in Ohio**

**Authors:** **Nicole Arnold**, The Ohio State University
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Background: Interest in cottage food and home bakery operations is increasing in Ohio, as evidenced by a 2022 webinar on home-based food production that was attended by over 300 Ohioans. These producers, however, often lack the resources and support needed to ensure their products are safe and wholesome.

Objectives: 1) Develop and implement food safety curriculum; 2) Establish multi-platform communication lines for technical assistance purposes; and 3) Create cottage food and home bakery resources.

Methods: Five “Making Food at Home to Sell” virtual Q&As took place between July 2024-November 2024. Each virtual Q&A consisted of a central topic: What foods can be home produced? Who is a home baker or cottage food producer? Where can I sell my products? When should I reach out for help? and Holiday food production. Each began with an educational presentation, followed by a live Q&A.

Results: The virtual Q&As had 114 live attendees, and 734 registrants received resources on the monthly topic. 94% of attendees who completed the evaluation (n=18) increased their knowledge of the topic area and 94% of attendees who completed the evaluation (n=18) indicated they planned to tell someone else about something they learned from the virtual Q&A. Attendees specifically mentioned topics like permits and licenses, which items can be home-produced, food safety and sanitation, labeling requirements, and information backed up by research/resources.

Significance: These virtual Q&A sessions aided the grant team in capturing frequently asked questions and gaps in information related to food safety and compliance which informed the content of a course outline.

**Title**: **Regional Food Hub Safety Training for New and Established Farmers in Southwest MO**

**Author(s):** Emilee Blansit, Springfield Community Gardens
**Maile Auterson**, 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. SCG operates 18 community gardens (9 of which are located in City Council Zone 1 – a particularly impoverished area of the city), three urban farms, a 4-H youth program, and a commercial community kitchen that collectively reach thousands of families located throughout Springfield. In addition to providing supplemental food resources for under-resourced neighborhoods and providing fresh foods that can contribute to the health and wellbeing of residents, once established, these gardens and farms also serve as the basis for community and economic development in their respective neighborhoods.

The vast majority of SCG programming is designed for socially disadvantaged, minority, low-income populations and communities (including immigrant communities).

In partnership with MU Extension, this project over two years will serve 100 farmers, expand online SCG food safety training offerings through an online training/testing platform, expand existing food safety topics from a current SCG FSOP grant (that was completed in 2024), and incorporate in person food safety training for populations with limited or no technology access (including aspects of GAP and FSMA PSA training), into the SCG farm incubator training model already in place, with a particular emphasis on underserved as well as new and beginning urban and rural farmers in Greene County, MO including farmers participating in SCG market gardens, regional food hub, and internship programs, strengthening SCG's capacity to provide regenerative approaches that address local public health challenges and high rates of food insecurity. The project will also accelerate and leverage community-based investments with various established local and regional institutions that are requesting to purchase more local foods.

**Title:** **A Multi-State Initiative for Food Safety Education Targeting Cottage Food and Home-Based Producers with Limited Resources**

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

This collaborative project developed a comprehensive food safety assistance program for home-based food producers and cottage food operations in Illinois and Oklahoma, extending to states within the North Central Region (NCR) and Southern Regional Center (SRC) for FSMA Training. Aligning with the FDA Food Code guidelines and state-specific cottage food laws, this project proposes to create food safety training, education, Extension, and outreach specifically for cottage food operations in Illinois, Oklahoma, and broader NCR and SRC jurisdictions. The specific aims of the project were as follows: (1) to create customized training content for home-based food producers and cottage food operations, covering topics such as Good Manufacturing Practices, food safety risk reduction, and legal aspects; (2) to develop a digital training platform with a Learning Management System (LMS) and an electronic repository for information dissemination, initially targeting Illinois and Oklahoma; and (3) to organize onsite workshops and stakeholder-driven education programs, focusing on underserved groups involved in cottage food operations.

The project team helped develop and update the "Illinois Cottage Food Handbook" and revised training materials to align with the Oklahoma Food Freedom Act. In Illinois, around 210 participants were educated through webinars and in-person classes via the "Learn@Illinois Extension" platform, covering topics like cottage food registrations, TCS versus non-TCS food, and fermented foods. Oklahoma training efforts reached over 757 participants, including 357 completing formal food safety training and 400 attending informational sessions recognized by the Oklahoma Department of Agriculture. These initiatives fostered numerous home-based food businesses, generating $5.04 million in direct income and $16.73 million in total sales impact, creating 857 jobs. The results and resources generated by the project are disseminated through various modalities. In Illinois, resources include the IL cottage food website, IL Cottage Food Handbook, webinars, and interviews. In Oklahoma, the Robert M. Kerr Food & Ag Products Center website offers an updated factsheet of the Oklahoma Food Freedom Act.

**Title:** **Bridging the Gap: Creating FSMA-PSR and GAP-Inspired Food Safety Outreach Program for Underserved Urban Growers in Illinois**

**Author(s):** **Pratik Banerjee**, University of Illinois, Urbana-Champaign
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This project aimed to create a food safety outreach program for underserved urban farmers in Illinois. The FSMA Produce Safety Rule (PSR) provides opportunities to train both traditional and non-traditional stakeholders, including growers, and to address the educational needs of small, specialized audiences, which is crucial for the success of the national food safety initiative. The USDA's alignment of its Harmonized Good Agricultural Practices (HGAPs) audit with FSMA-PSR requirements highlights the importance of both programs in minimizing microbial contamination, though their scopes can be confusing for small growers. To address this, in this project, we developed a food safety training, education, Extension, and outreach program in Illinois integrating key aspects of PSR and GAPs with specific objectives: (1) to identify food safety training needs and barriers for urban minority growers in Illinois, and (2) to organize onsite workshops and a stakeholder-driven education program covering various food safety topics.

We developed the "Food Safety Boot Camp" content covering GAPs, FSMA-PSR, food safety plans (FSPs), water sampling, biological soil amendments, and general food safety topics. Workshops were held in urban and suburban areas throughout Illinois, focusing on HGAP resources and FSMA-PSR distinctions. Additionally, efforts were made to increase the number of FSMA Produce Safety Alliance (PSA) training recipients from underserved stakeholders. An online, self-paced version of this food safety boot camp training was also created.

Over 132 small-scale farmers from various regions of Illinois, including 62 from urban areas, took part in these boot camps. Our pre-workshop survey showed that 67% and 84% of attendees were unaware of the distinctions between PSR and GAPs and lacked a farm FSP, respectively. After participating in the boot camps, about 86% of the attendees expressed an interest in developing a farm FSP, and the percentage of participants that rated their knowledge of the differences between PSR and GAPs increased by 52%. Nearly all attendees (~ 97.5%) felt that the workshops boosted their willingness to adopt an FSP in their operations.

**Title:** **Reducing Food Safety Risk at Farm Level**

**Author(s):** **Dorathy Barker,** Operation Spring Plant, Inc.

Socially disadvantaged farmers and ranchers, among other groups of farmers, are an important component of the food chain system in the United States, and as such, share in the responsibility of ensuring food safety to maintain public health. This group of farmers also plays critical roles in managing and minimizing food safety risks. With over three decades of working and interacting with socially disadvantaged in North Carolina, Operation Spring Plants (OSP) has the knowledge of barriers they face in implementing food safety programs. Such barriers are, but not limited to, lack of skills in identifying food safety hazards in their operations, lack of understanding the elements of the emerging national certification system, lack of knowledge of food safety regulations, high compliance costs, limited knowledge and skills on safe and healthy food production practices, and lack of skill on value added product development. Additionally, these producers of traditional agricultural commodities lack understanding of Good Agricultural Practices (GAP) and Good Handling Practices (GHP) which are the food security and safety management protocols for the production and post-harvest handling of fruits and vegetables and animal products. They do not have adequate records that can trace produce to the field where it was grown and harvested.

To address these issues, OSP proposes to conduct a food safety education and outreach project with the goal of providing the tools and skills needed for these underserved farmers, to produce safe and healthy foods, as well as increase their knowledge of food safety regulations. The project will focus on the following: 1.) Food Safety Regulations, 2.) Safe and Healthy Foods Production Practices, and 3.) Value Added Product Development. The overall impact of this project is that producers will develop the knowledge and skills to ensure the safe and efficient production, processing, and distribution of food products while focusing on the short and long-term safety and health of consumers. They will meet market demands for quality assurance through compliance with the standards, while adjusting for shifting technological and government policies. Additionally, there will be an increased income for these producers and improved quality for them, their communities, and that of the consumer at large.

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

**Authors:** **Manreet Bhullar**, Kansas State University
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Introduction: Fresh produce remains a leading source of foodborne illness outbreaks due to contamination risks during pre-harvest, harvest, and post-harvest stages. Despite active training and education on the FSMA Produce Safety Rule (PSR), many small-scale growers in Kansas, Missouri, and South Dakota struggle to understand and implement best practices for compliance.

Objective: This collaborative education and training project aims to improve produce safety practices and FSMA PSR compliance by developing and implementing augmented reality (AR) training tools tailored to small scale growers in the Midwest.

Materials and Methods: The project aims to establish a multi-state educator and stakeholder network guided by a needs assessment to identify topic area before developing AR modules in multiple languages addressing critical topics such as agricultural water quality and BSAAOs. After the resources have been developed and validated by the advisory board, the plan is to conduct in-person AR trainings and compare knowledge transfer and engagement across lecture-based and AR-based training. Finally, the project findings and materials will be disseminated to regional and national partners. Training effectiveness will be evaluated through pre-/post-tests and follow-up surveys.

Results: The AR training modules will simulate real-world on-farm scenarios, highlight best/worst practices, and be offered alongside technical assistance and free water testing services. Evaluation results (late 2026/2027) will compare engagement, knowledge retention, and implementation intent across training formats.

Overall Significance: By leveraging AR technology, this project aims to address access barriers to traditional training and improve comprehension of complex food safety topics. The outcome will enhance food safety and foster sustainable growth for small-scale farms in the Midwest.

**Title:** **Leveling Up Produce Safety Knowledge Among Underserved Communities by Building Local Capacity and Creating a Dynamic Peer Network**

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Ensuring fruit and vegetables growers can comply with §112.22(c) of the FSMA Produce Safety Rule requires access to Produce Safety Alliance (PSA) Grower Trainings and PSA Trainers nationwide. There has been a decrease in active PSA Trainers due to many factors including retirements, job changes, and funding reductions. This created an opportunity to strategically target areas lacking PSA Trainers by providing growers and developing professionals in these underserved communities with the chance to enhance technical expertise and become new PSA Trainers. The Produce Safety Fellows program focuses on developing PSA Trainers to support small, rural farm owners with particular focus on African American, Hispanic, and tribal growers. This program equips Produce Safety Fellow cohorts with an understanding of the Produce Safety Rule requirements, how to assess microbial risks associated with fresh produce production, how to effectively deliver PSA Trainings, and an experiential learning opportunity to apply food safety concepts in real life scenarios. A dynamic peer network is being fostered by facilitating interactions between cohorts through quarterly meetings that encourage collaboration and peer learning. This project received funding to develop 48 PSA Trainers. In the first year, 36 individuals representing 19 states were recruited. Participants completed the initial two tiers of the program: the PSA Grower Training and the PSA Train-the-Trainer courses. The first PSA Advanced Trainer workshop is scheduled for Fall 2025 in Texas. The expected outcome of this project is to expand the pool of active PSA Trainers nationwide and increase knowledge and proficiency in science-based produce safety practices within underserved communities. Although this is only the project's first year, some Produce Safety Fellows have already started to organize and deliver PSA Grower Trainings within their communities to expand produce safety knowledge and the implementation of risk reducing food safety practices on fresh produce farms.

**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(s):** **Cindy Borgwordt,** Lincoln University of Missouri
Joshua Dunne
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The COVID Pandemic changed so many things, one that is often overlooked is the push for lay people to grow their own foods and create a more sustainable agricultural system for themselves and their communities. We are seeing an increase in constituents asking about food preservation, value-added products, and other food security and food safety issues. This project is designed to fill in the gaps that many people have on GAPS.

Working with small producers and small restaurants, this project provides food safety training virtually and hands-on to ensure a safe food system. This past year has seen the program grow rapidly and providing more SERVSafe training (in English and Spanish), EHACCP training, and classes for nearly 200 individuals. As well as continuing partnerships with Missouri Enterprise Project and The Food Safety Doctor LLC to provide in person HACCP training and PCQI training respectively.

Moving forward Lincoln University (MO) is working to bring the PCQI training in house and build knowledge and capacity to continue this important education after the grant timeline has ended. Program Director Joshua Dunne is working with newly hired Food Scientist Dr. Sujan Acharya to do PCQI, HACCP, and other food safety trainings all through Lincoln University by the end of the year.

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

**Author(s):** **Christopher Callahan,** University of Vermont
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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 no 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 (NECAFS) 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 built a working group to coordinate multi-state hydroponic and aquaponic initiatives and clarify produce safety educational needs specific to hydroponics and aquaponics. We created a website, Produce Safety in Hydroponic and Aquaponic Operations (go.uvm.edu/ponics), which introduces key concepts and compiles links to relevant resources for growers. We hosted webinars and created multimedia case studies, linked to the main project page and available on the NECAFS YouTube channel. We leveraged all these resources to develop a modified, tailored curriculum for the Produce Safety Alliance Grower Training (piloted May 20-22, 2025) and are in the process of evaluating outcomes and revising the materials for general distribution. As an additional result of working group activities, coordination of research efforts to address identified knowledge gaps will be facilitated. Tailored educational resources and events were created for HP/AP growers, educators, and regulatory to enhance their understanding of produce safety practices specific to soil-less growing.

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

**Author(s):** **Lakshmikantha H. Channaiah**, University of Missouri
Kelly Getty, Kansas State University
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The “Food Safety by Design” is a food safety education and outreach program with the objective to develop a comprehensive Food Safety Modernization Act (FSMA) based education and training program designed for small and medium scale value added food processors selling primarily direct to consumers; develop an outreach program to support small and medium scale food processors food safety requirements such as process authority review; and communicate the project results to stakeholders across the North Central region, USDA and national partner networks.

Since the inception of this project, our collaborative team has been conducting a series of training and/or workshops on Better Process Control School (BPCS)-acidified foods, BPCS-acidified & low acid canned foods, HACCP training, environmental monitoring program, food safety microbiology workshops, process validation & verification, hands on workshops on canning, and food labeling through in-person and/or online platforms. Participants expressed confidence (~96%, post-training) in understanding the science and regulations of safe food processing.

Over the last two years, our team has issued >100 process authority letters to a variety of small food processors in Wisconsin, Missouri and Kansas, resulting in numerous new value-added food businesses. Our focus for 2025-26 will be on developing and strengthening a food safety culture throughout the North Central region, while continuing to support small and medium-scale food processors. Additionally, we have plans to develop video case studies and extension fact sheets highlighting the key food safety principles based on the FSMA principles.

Project outcomes have been communicated with stakeholders across the North Central region, USDA and national partner networks which will provide a template for education and outreach programs that can support small-scale, value-added food producers across the U.S.

**Title**: **Developing a Practical Self-Audit Tool for Assessing Compliance with Current Good Manufacturing Practices (Cgmp) in Small and Very Small FDA-Inspected Facilities**

**Author(s):** **Byron Chaves**, University of Nebraska-Lincoln
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Customizing current good manufacturing practices training and education for small and very small food facilities across the U.S. USDA NIFA

This project aims to enhance food safety compliance among small ready-to-eat (RTE) food producers in Nebraska. It uses a comprehensive GMP Facility Checklist based on FDA FSMA PCHF, FDA Food Code, SQF, BRCGS, and FSSC 22000 standards. Initial assessments are conducted at 3–4 facilities, evaluating 10 sub-sections (e.g., Qualified Individual, Personnel) across 67 questions. Each question is rated as Satisfactory, Minor, Major, or Critical, with a minimum compliance score of 70%. Facilities scoring below this threshold receive targeted training and follow-up visits 2–3 months later, focusing on their 2–3 weakest areas using expanded, scheme-specific checklists. The project concludes with a final report assessing compliance improvements and a processor survey evaluating the effectiveness of training and follow-up. By addressing critical GMP areas such as sanitation, allergen control, and defect management, the initiative improves food safety and builds capacity among small manufacturers to meet regulatory requirements. Preliminary results show improved understanding and implementation of GMPs, with potential for broader application across regions and food sectors. This approach bridges the gap between regulatory expectations and practical implementation, fostering a culture of safety and compliance in the RTE food industry.

**Title:** **New Mexico Food Safety Strong (NMFSS)**

**Author(s):** Camille Vasquez, Rio Grande Community Development Corporation
**Jayme Chester**, Rio Grande Community Development Corporation

The Rio Grande Community Development Center (RGCDC) is a nonprofit organization located in the unincorporated South Valley of Bernalillo County in New Mexico. Founded in 1986, the RGCDC's mission is to be the trusted and accessible community hub for social and economic entrepreneurship which facilitates self-sufficiency while honoring the people's voice and culture. Since 2005, the RGCDC has operated a food business incubation program which supports emerging value-added food businesses with access to commercial kitchen space, training, and technical assistance, including food safety compliance.

Based on its long history in the food industry, the RGCDC observed gaps in food safety standards for value-added products in New Mexico. Leveraging our experience with food safety in the business incubator and our cultural competence in working with bilingual and low-income populations, the RGCDC is developing a food safety curriculum for value-added producers to be disseminated statewide. The curriculum will support small farmers and producers who are initiating or improving value-added processes with the knowledge and tools to comply with both federal regulations and local permitting requirements.

The RGCDC will disseminate the curriculum statewide through its partnership with the New Mexico Farmer's Marketing Association (NMFMA), which has a large network of farmers in New Mexico, and with 4 food hubs, which serve communities statewide. The RGCDC will collaborate with NMFMA to reach farmers who are interested in expanding into light value-added operations (e.g. chopping or slicing). The RGCDC will work with food hubs to identify food safety trainers who will be trained in the curriculum and can then provide trainings in their own communities.

By developing and disseminating multi-lingual, culturally competent curriculum to food hub trainers and farmers statewide, the RGCDC will increase access to food safety technical assistance and grow the food safety culture in New Mexico.

**Title:** **Developing a Hazards and Controls Guide to Support Safe Seaweed Production and Marketing**

**Author(s):** **Michael Ciaramella**, Cornell University
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Interest in seaweed production and consumption is growing across the United States. With increasing production comes a greater need for processing and enhancing processing infrastructure for seaweed and seaweed products. As industry continues to develop new products and works towards growing the consumer market, it is important to provide guidance on food safety hazards and their controls to protect public health.

For nearly two years, a global team of food safety experts has been actively discussing the challenges surrounding seaweed food safety. Within this group, a core team has drafted an extensive Seaweed and Seaweed Products Hazards and Controls Guide. The guidance document will support the growing industry by providing the resources necessary to develop and implement effective controls for significant food safety hazards specific to seaweed.

Drawing on the available scientific knowledge, the guidance covers all identified potential food safety hazards associated with edible seaweed species and known processing methods. In addition to outlining the hazards, it provides insights on strategies for controlling such hazards within seaweed processing operations.

The guidance document underwent thorough external review with 30 confirmed reviewers representing industry, agencies, and academics equally. The project team is currently working to review and finalize comments received. Once published, it will support safe processing and marketing of seaweed products globally and serve as the foundation for future discussions on developing a seaweed specific food safety training. In addition, the resource and contents will be shared through three topical webinars focused on regulations, biological hazards, and chemical hazards.

**Title:** **Produce Safety Posters: Educational Tool for Non-English-Speaking Fresh Produce Growers**

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Many non-English-speaking refugee growers in the Midwest U.S. struggle to adopt produce safety practices due to language barriers and a lack of accessible educational resources. While these growers bring valuable agricultural expertise, the absence of culturally relevant training materials hinders their ability to comply with U.S. produce safety standards. This project addresses this gap by developing animated videos and posters in growers' native languages to enhance their understanding and implementation of produce safety practices.

The project seeks to create culturally and linguistically tailored educational resources, including animated videos and posters, to improve produce safety knowledge among refugee growers and promote good food safety practices.

Feedback was collected from the project advisory board and a focus group (n=10) of refugee growers. The project team developed animated videos and posters based on responses to ensure cultural and linguistic relevance. In collaboration with Scientific Animation without Borders (SAWBO), two short, animated videos were created on "How to control germs from animals on the farm" and "Understanding fertilizers and their risks." These videos, available in Burmese, Swahili, Nepali, and Kirundi, cover sources of germs from animals, control strategies, fertilizer types, safe application intervals, and record keeping. Additionally, four posters were developed on topics including sick worker management, visitor management, animal-associated germ control, and fertilizer safety. The posters use culturally relevant visuals and minimal text, also translated into the same four languages, to communicate the rationale and implementation of key practices.

The videos and posters will serve as culturally appropriate tools to improve refugee growers' engagement in training and adopt good produce safety practices and contribute to safer food production on the farms.

**Title:** **California Center for Food Safety**

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To support CA growers, many non-governmental organizations and academic institutions provide produce safety education, in addition to technical assistance to growers, through receiving funds from federal and state competitive grant programs. From 2016-2022, 37 projects were funded across 18 organizations. While these groups have been successful completing their individual project goals, systematic coordination at a statewide level is lacking. Leveraging efforts and sharing resources can enhance the impact of these projects. Moreover, there have been limited professional development or advanced training opportunities in CA. Through assembling a consortium of food safety educators together in a formal manner, we will be able to facilitate peer-to-peer learning. The main goal of this project is to establish the California Center for Food Safety (CCFS) to coordinate statewide efforts related to produce safety education. Additionally, the CCFS will facilitate the training of a cadre of food safety educators within California. Since September 2024, the project team has delivered 14 PSA Grower training courses (151 certificates issued). CA PSA Lead Trainers offer weekly office hours for new Trainers which have been attended by five individuals who now deliver Modules in courses. Two additional individuals have attended the PSA Train the Trainer course. The Produce Safety Rule “alternative” curriculum is conducted in a field setting using the farm environment as a teaching tool and clearly distinguishes Good Agricultural Practices (GAPs) and regulatory requirements. The training was piloted by Co-PD in CA in March and was attended by 10 growers and the PD. Monthly produce safety educator office hours were launched in February and serve as a mechanism for educators to ask questions of project Co-PDs. Evaluation tools are being developed to assess trainer learning outcomes. A one day in person technical assistance workshop and separate produce safety research symposium will be organized for developing educators.

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

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Developing and implementing the 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 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 topics areas including food safety regulations, good manufacturing practices, quality assurance and quality control, food microbiology, and general food safety. Recording and editing of lecture material was finalized in 2024. The course is being piloted via YouTube and Qualtrics surveys for a subset of Extension professionals in CA. The final version of the course will be built in Moodle and launched in summer of 2025. Learning evaluation data will be analyzed on a rolling 6-month basis. The project team has collaborated in PCQI trainings for the duration of the project period, three members attended the FSPCA 2.0 training in 2024. The first offering of PCQI 2.0 will occur in CA in summer 2025.

**Title:** **Food Safety Outreach & Technical Assistance to Historically Underrepresented Farmers in the Inland Empire of Southern California**

**Author(s):** **Hung Kim Doan**, University of California Cooperative Extension
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Small-scale historically underrepresented (HU) farmers in Southern California's Inland Empire—primarily Korean and Spanish-speaking producers—face significant barriers in navigating the Food Safety Modernization Act (FSMA). These include language and cultural challenges, limited access to technical assistance, and the high cost and complexity of compliance. This project aimed to build the capacity of HU farmers to meet FSMA Produce Safety Rule requirements through accessible, culturally tailored education and support. To address these needs, we offered three Produce Safety Alliance (PSA) Grower Trainings in the region and two additional statewide trainings open to local growers, using both in-person and virtual formats. In response to ongoing challenges, we also conducted eight on-farm workshops delivered in Spanish or Korean by bilingual community educators. These workshops covered key food safety topics such as employee hygiene, sanitation of harvest tools and equipment, rodent control, recordkeeping, and post-harvest handling. In addition, we conducted over 100 individualized on-farm food safety assessments. These assessments included visual inspections of farm cleanliness, signage, hygiene stations, break areas, wash and pack areas, and pesticide and fertilizer storage. Farmers received tailored recommendations to improve food safety practices and prepare for potential audits. Post-program surveys revealed that over 95% of participating farmers cited limited access to food safety resources, and 73% identified the lack of food safety information tailored to niche crops as a significant barrier. Many expressed that FSMA compliance remains too complex and financially burdensome for small operations. This project demonstrates the effectiveness of personalized, in-language technical assistance and hybrid training models in supporting small, under-resourced farmers. Tailored outreach can bridge critical gaps in food safety education and foster greater confidence in compliance efforts.

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

**Author(s):** Anita Adalja, La Semilla Food Center
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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, worker well-being and safety and holistic farm practices, rather than centering regulatory aspects or technical skills. Continuing our work from the last three year's Food Safety program, we are continuing to partner with active farmers in our region who are not generally covered by the Produce Rule and who are not typically represented in food safety specialist spaces. We have completed the curriculum and Quality Management System (QMS) for our Seeds of Safety two-day food safety training in collaboration with our Food Safety Ambassadors. We piloted the curriculum throughout New Mexico and solicited participant feedback to ensure that the content is culturally relevant and impactful to the growers in the La Semilla agroecology network. The Food Safety Ambassadors who supported the development of our food safety curriculum were a cohort of farmers who represented a wide range of agricultural backgrounds, including indoor farming, mushroom farming, farming alongside animals, year-round farming, and landless farming. This diversity ensured that our curriculum included the rich and relevant experiences of many of the farmers we serve. The curriculum and QMS have been submitted and are currently under review to be accepted as an alternative training for the state-sponsored Farm to Institution Approved Supplier Program. Our curriculum, which is rooted in decolonizing and indigenizing food safety concepts, has a multi-county, state-wide, and multi-state impact. This spring and summer we are focusing on conducting our Seeds of Safety trainings throughout New Mexico and Texas, reaching dozens of farmers. Additionally, our team has achieved and maintained HGAP+ status for our food hub, which has significantly opened up market access opportunities for over 25 farmers in our network.

**Title:** **Managing Water Well: Enhancing Water Quality to Foster Food Entrepreneurship and Farm Food Safety**

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Clean water is a critical input for food production, whether on the farm, in the home kitchen, or for the manufactured food industry. While entities on municipal water supplies have readily available clean water, those in private wells may not understand the need for clean water as an ingredient and sanitation input, or how to monitor and manage their water supply. A team from University of Georgia, Auburn University, Virginia Tech, and New Mexico State University is working to create a water management training focused on users of private well water. The training will include online modules and learning tools, as well as an in-person option for delivery by local Extension and other community partners. Comparisons between the delivery methods will determine which is most effective. In early 2025, the team met at New Mexico State University for their kick-off design summit. The team is currently in the midst of curriculum development. This work was supported by the Food Safety Outreach Program grant no. (2024- 70020-42955) from the USDA National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication/presentation are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

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

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Community Alliance with Family Farmers (CAFF) is a non-profit organization that has been working with family farmers throughout California for over 45 years. 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, food hubs, and our network of farmers. We have been working on completing four main objectives: 1) strengthening relationships with small 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 2025, we have collaborated with two food hubs to enroll nine farmers (six of whom have fully completed their updates) in our Food Safety Partner Farm Program, 100% of which are small farmers. The remaining three farmers worked with CAFF staff all winter to prepare for GAP Audits and to improve their food safety practices overall, consequently completing their audits in early April, late June, and mid-September 2024. Since then, CAFF staff have been working with one new Partner Farm who we expect to complete their GAP Audit in late May or early June 2025. We've seen thus far that farmers are deeply appreciative for the free, vital food safety support. We also released farmer and trainer resources posted to the Food Safety Clearinghouse in September 2024. Resources include: 1) Cleaning and Sanitizing Kit Activity Lesson (English), First Aid Kit with QR Codes (English, Spanish), Cleaning and Sanitizing Kit with QR Codes (English, Spanish), and Understanding Sanitizer Labels Lesson Plan (English). We will be finishing up the remaining objectives during the rest of the grant term.

**Title:** **Developing an Active-Learning Outreach Program to Support Small and Very Small, Dried Produce Processors' Food Safety Management**

**Author(s):** **Yaohua Feng**, Purdue University
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Outbreaks associated with dried produce imply that processors need to enhance food safety management and use validated food safety procedures to ensure food safety of their products. Small and very-small scale dried produce processers have unique barriers and challenges when building food safety plans. Previous studies suggest these barriers and challenges include lack of resources, experience, food safety knowledge, and interest in food safety.

This project will develop an active-learning food safety program, Dehydrating Safely, to increase food safety knowledge and behavior compliance that will help to promote food safety culture in the dried produce industry and to reduce foodborne illness. We will utilize qualitative and quantitative research approaches to 1) Assess food safety knowledge, attitude and practice, and identify the barriers of small and very-small dried produce processors for developing food safety plans; 2) Develop an audience-driven food safety outreach program that addresses the barriers identified and utilizes active-learning interventions to increase knowledge level and practice compliance, impacting day-to-day food safety challenges on production; 3) Develop and evaluate a train-the-trainer program for two essential trainer groups, extension educators, and food safety managers.

Our proposal aligns with USDA's strategic goals of 1) maximizing the ability of American agricultural producers to prosper by feeding and clothing the world, 2) strengthening the stewardship of private lands through technology and research, and 3) providing all Americans access to a safe, nutritious, and secure food supply. The project objectives address the Food Safety Outreach program audience priority of serving small-scale food processors.

**Title:** **Transformative Food Safety Learning 1.0: Using Virtual Simulation to Engage Small and Very-Small Food Processors**

**Author(s):** **Yaohua Feng**, Purdue University
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Food industries, regardless of their sizes, need to provide safe food to consumers. The Food Safety Modernization Act (FSMA) Preventive Controls for Human Food (PCHF) Subpart A (21 CFR 117.4) has specifications for food industries on employee training. Small-scale food processors have unique barriers to food safety regulation compliance, but research has demonstrated that audience-targeted food safety training could address those barriers. After the COVID pandemic, the high turnover rate of employees made food safety training even more difficult to implement. Many small processors prefer low-cost virtual training with hands-on components since it saves time and allows them to self-pace their learning. The project team will develop a Transformative Learning Program (TLP) to address those challenges. The first step (TLP 1.0) is proposed in this project to develop and evaluate virtual simulation modules to engage small food processors and build the food safety culture in their business.

The objectives are:
(1) Identify module content and address the needs of small-scale food processors using the Delphi method;
(2) Evaluate the effectiveness of the virtual simulation modules and assess behavior-change via surveys, game analytics, and case studies with observations and interviews; and
(3) Develop a train-the-trainer course among extension educators and food safety professionals to sustain the impact of the TLP.

Our proposal aligns with USDA's strategic goals 1,2,4, and 7. We will ride the tide of virtual simulation food safety training to increase small food processors' self-efficacy in food safety management and improve their economic health and viability.

**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 pursing 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 2,500 businesses have filed attestations, and large portions of businesses that have filed do not appear to be actively manufacturing and/or selling products covered by PCHF, while many food businesses that should be Qualified Exempt have not filed attestations.

It is suggested that SMPs are either not aware of the Preventive Controls regulations, or that they are aware, but choose not to file. Within the food safety community, it is proposed that lack of participation is a result of lack of awareness of the rule – that processors that are not aware of the PC Rule will not comply with the Rule. On the other hand, there is growing evidence that processors' motivation to comply may be more complex – as businesses, they must weigh the costs and benefits of compliance. The costs of compliance are significant, both in terms of outlays of real money, and also in terms of effort to understand and properly engage in a series of complex administrative tasks. The benefits, on the other hand, may not be clear to many processors.

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. In this project year, we engage with Objective 2 to identify the population of processors that should be included in outreach for compliance with PCHF.

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.

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:** **ITIPS: Interactive Tools to Improve the Practice of Food Safety**

**Author(s):** Barbara Chamberlin, New Mexico State University
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**Daise N. Flores**, New Mexico State University
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Small processors in the food industry often struggle to train their employees, which hampers their ability to meet regulations and pass audits. Interactive online tools like virtual labs and games can increase the effectiveness of training by offering differentiation for each learner, access outside a formal classroom, and higher engagement. This project included the development of an interactive program designed to educate workers at small facilities on Good Manufacturing Practices (GMP). The online module, *called iTIPS (Interactive Tools to Improve the Practice of Food Safety),* shares an innovative approach to providing GMP training, focusing on a self-paced mode and engaging experience through digital media. The iTIPS program includes an opening animation that explains the concepts of GMPs in facilities, and an interactive that users can explore to learn more about each of the four key areas of a facility: breakroom, processing room, warehouse, and facilities. In the final year, researchers evaluated the impact of the interactive on learning outcomes for 105 users, measuring changes in confidence in the ability to apply food safety practices for each of the four rooms of the interactive facility. The study showed significant changes in self-reported knowledge of the users and their ability to apply what was learned in the proper setting. The findings support the idea that effective online digital tools can meet an increased demand for remote learning in Food Safety Education. In the final year, the team is creating a series of four self-paced online courses where learners can explore each of the four areas of GMP in depth. All materials are available online at https://itipsfoodsafety.com.

**Title:** **Public Health Microbiology and Process Authority Support for Tennessean Entrepreneurs**

**Author(s):** **Aliyar Cyrus Fouladkhah,** Tennessee State University

Food safety challenges associated with small entrepreneurs in underdeveloped areas of Tennessee have been a major public health concern in recent years. Since the start of the 21st century, Tennessee has been involved in >950 foodborne outbreaks, adjusting for population (incidences per 100K), this rate is nearly 4 times higher than state of California, as an example. Thus, the need for evidence-based outreach and technical assistance is noticeable to ensure safety of Tennessean entrepreneurs and their customers. This project is a holistic and evidence-based approach to support Tennessean entrepreneurs and strengthen 1890 land-grant system in this area. So far, the Public Health Microbiology program (PI: A. C. Fouladkhah) was able to assist more than 192 entrepreneurs in the state of Tennessee and around the country with one-by-one consultation and testing. About 55% of these stakeholders are start-up (very small) companies, with 44% of them categorized as women-owned companies, and 67% are based in the state of Tennessee. Others were from PA, FL, KY, VA, GA, CO, WA, OH, MI, MO, CA, MT, AR, AZ, MD, MN, and AI. The current presentation will discuss the detailed deliverables of extension, outreach, and technical assistance from the public health microbiology program in Nashville.

**Title:** **Development and Implementation of Sanitation Training Tools for Small Growers**

**Author(s):** Xiuping Jiang, Clemson University
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Kimberly Wiley, University of Florida
**Angela Fraser**, Clemson University

Small fruit and vegetable growers face unique sanitation challenges that increase foodborne disease risks, leading to financial loss and business closures. While those with annual sales under $26,000 are exempt from the Food Safety Modernization Act (FSMA) - Produce Safety Rules' training, food safety education remains vital. Our project aims to reduce food safety risks by tailoring training to the specific needs of small growers. Objectives include: (1) assessing current sanitation practices, (2) evaluating the impact of a sanitation module on grower knowledge and practices, and (3) determining if supplemental materials improve educators' knowledge and confidence. We first conducted stakeholder interviews (n=7) to inform curriculum development. Then, an online survey, farmer interviews, and a systematic literature review (SLR) assessed existing practices and training effectiveness. Preliminary results show small growers rely on on-farm groundwater, non-refrigerated transport, and Extension agents for guidance but lack standardized sanitation procedures and hesitate to engage with researchers due to regulatory concerns, making them a hard-to-reach population in need of targeted outreach strategies. The SLR found limited experimental studies on food safety training for growers using a true experimental design. Currently, training modules are in draft form, incorporating theoretical sanitation knowledge for educators and practical applications for growers as recommended by the stakeholder panel. The key outcomes of this project will evaluate the training's impact on growers' knowledge and educators' knowledge and confidence in addressing sanitation issues using a randomized experimental design.

**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

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, and online to facilitate the participation of stakeholders in remote locations. This will facilitate their ability to make knowledgeable and cost-effective management decisions about the production and processing of safe and healthy produce and value-added products.

We hosted 17 online trainings to reach our stakeholders in remote locations: 11 – PCHF Part 2 trainings, 1 – Introduction to Third Party Food Safety Audits, 1 – Developing Food Safety Plan, 1 – Value-Added Food Processing and Food Safety Workshop, 2 - Supply Chain Program Webinar, and 1 - Basics of Sanitation & GMP in Spanish. We have held 16 in-person trainings: 2 – PCHF Part 2, 4 – Developing Food Safety Plan, 6 – GMP & Basics of Sanitation, 4 – Value-Added Food Processing and Food Safety Workshop. With our in-person trainings, we have reached people in rural areas and partnered with our Washington State University Extension Counties. We have also partnered with two tribes in Washington.

We are in the review and final stage for the curriculum of our online asynchronous trainings, 9 Online Learning Management System (LMS) content. WSU Extension is currently under contract for a new LMS, so we were required to pause.

1. Basics of Cleaning and Sanitation (Ready to Upload)
2. Basics of Cleaning and Sanitation in Spanish (Ready to Upload)
3. Basics of Food Microbiology (Ready to Upload)
4. Basics of Food Microbiology in Spanish (Ready to Upload)
5. Good Manufacturing Practices (Ready to Upload)
6. Good Manufacturing Practices in Spanish (Ready to Upload)
7. Developing Food Safety Plan (Review - Final)
8. Food Safety for Acid and Acidified Food (Review - Final)
9. Food Safety for Small-Scale Seafood Processors (Review - Final)

**Title:** **Empowering Neurodivergent Individuals in the Fresh Produce Industry through Accessible Food Safety Outreach and Training**

**Author(s):** **Kristen Gibson**, University of Arkansas System Division of Agriculture
Matheus Cezarotto, New Mexico State University
Barbara Chamberlin, New Mexico State University
Dorothea Lerman, University of Houston – Clearlake
Pamela Martinez, New Mexico State University
Phil Tocco, Michigan State University

Development and optimization of food safety worker training programs with an inclusive-by-design approach is a growing need and can enhance diversity, equity, and social inclusion within amenable sectors of the food industry. Our overall goal is to establish an inclusive and sustainable framework for food safety training and support that effectively integrates neurodiverse individuals into the food industry workforce, fostering their professional growth and contributing to the overall success of agricultural enterprises. The first step to achieving our goal is through the inclusive design of food safety training via optimization of the Produce Safety Alliance Grower Training curriculum to meet the unique learning requirements of neurodivergent (NDV) learners who compromise 15-20% of the U.S. population. To be successful, training of co-workers and supervisors of NDV persons will be critical to providing effective support of NDV persons employed within the food industry. This will be implemented primarily through multimedia learning tools that address the learning accommodations required for low to higher need NDV persons. This multimedia training approach is proven to aid in better understanding of concepts and adoption of behavior change. Our target audience include NDV persons seeking meaningful employment within the produce industry and their future co-workers and supervisors. This project will result in engaging and transformative educational and training experience for NDV individuals seeking employment within the food production industry, generally. Outcomes include tangible products (i.e., online courses for employees and their managers, with additional courses as necessary for NDV learners) and outcomes for learners. After completion of the user-centered designed training materials, we anticipate that participants will demonstrate proficiency in specific tasks and will be better able to complete tasks in the workplace. In addition, employers will be more inclined to hire learners who have completed certificate courses and will be open to supporting neurodiverse employees.

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

**Author(s):** **Kristen Gibson**, University of Arkansas System Division of Agriculture
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Farmers markets offer an accessible way for small-scale or hobbyist producers to sell produce from their farms or distribute value-added products. These local food producers may be unaware of the risks associated with both fresh produce and derivative products. The overall goal of GLEAN is to provide transformative and engaging food safety training to local food producers, specifically farmers market vendors, to increase food safety knowledge, elicit behavior change, and prevent food safety issues within direct-to-consumer venues. First, food safety knowledge gaps and training needs relevant to farmers market vendors were identified through completion of a scoping literature review. This review revealed critical gaps in food safety knowledge and practices including i) consistent lack of adequate handwashing practices; ii) insufficient refrigeration of potentially hazardous foods; iii) absence of temperature monitoring; and iv) limited knowledge and resource constraints among small-scale producers. These identified gaps were then utilized to articulate learner needs and game activities during a game design summit which have since been integrated into a mobile-responsive gaming platform (Market Set Go!) in which players manage a farmers' market and face different food safety challenges through completion of mini-games. "Market Set Go!" is currently being beta tested with targeted end users with a planned release by August 2025. Overall, the game has been designed to help small-scale producers and entrepreneurs ***know what they don't know*** and shape their own strategies for entering their local and regional food systems including farmers markets and other direct-to-consumer venues. 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:** **Expanding the Capacity of Community-Based Produce Safety Educators to Serve Hard-to-Reach Farmers in the Mid-Atlantic Region**

**Author(s):** **Lindsay Gilmour**, Chesapeake Agriculture Innovation Center
Aleya Fraser, Chesapeake Agriculture Innovation Center

Our project provides technical assistance to economically disadvantaged, urban and hard-to-reach farmers by equipping produce safety educators (PSEs) from these communities with the expertise, skills and confidence to educate their peer farmers about the PSR, GAPs and risk reduction as foundational components of good farming and good business. We accomplish this through 4 objectives:

1. Provide paid professional development and in-the-field training opportunities for our team of PSEs to deepen their understanding of food safety and GAPs. Trainings to date include Harmonized GAP Auditor training, PSA Train the Trainer, PSA Advanced Training, Maryland GAP, NM Produce Safety Tiered Training, PCQI, and produce safety webinars and tutorials on multiple topics including ag water, mushroom farming, ‘ponics, worker training, soil amendments, food safety plan writing, and buyer’s GAP requirements.
2. Provide opportunities for the PSEs to teach farmers in their communities and beyond. Collaborating with community partners, the PSEs have taught 9 in-person workshops on urban farms, 4 workshops at regional conferences, 3 webinars, and 5 PSA Grower Trainings, reaching at least 300 farmers.
3. Provide farmers with one-on-one coaching in risk assessment, food safety plan writing and audit readiness to enable them to enter wholesale markets. To date, PSEs have completed 20 on-farm risk assessments and helped 8 farmers write food safety plans.
4. Maintaining and expanding the curated resources for both educators and farmers in our Produce Safety Toolkits on the CAIC website, including our own food safety plan templates for different GAP standards, videos and webinar recordings, and worker training materials.

This year we plan to: provide Good Manufacturing Practices training for the PSEs; teach 3 more on-farm workshops and provide 3-4 farmers with one-on-one TA; and adapt our Produce Safety 101 workshop to an online course on the CAIC training platform.

**Title:** **Clean Start 2.0: Developing a Food Safety Community of Practice in Eastern Iowa**

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

Iowa Valley RC&D has been growing and building their Clean Start Food Safety Coaching Program since 2020 to support beginning and nontraditional fruit and vegetable growers in Eastern Iowa. Through this project IVRCD grew the 6-month coaching program to provide technical assistance to farmers. IVRCD introduced new group peer to peer learning sessions and farm work sessions for beginning farmers to learn from each other. Farmer participants helped their peers develop food safety SOPS and policies for their farms. The program has coaching 24 businesses through the programming. Each farm business developed a food safety plan and implemented food safety infrastructure improvements to reduce risks that were identified while developing their plans. On their own farm IVRCD has created a new Food Safety Innovation Center where they have hosted hands-on training workshops, developed new print and video resources in additional languages, trained a bilingual PSA Food Safety Trainer and organized new continuing education trainings for Iowa GAP auditors and PSA trainers. The project has increased the capacity of Iowa's food safety professionals to support the next generation of fruit and vegetable farms in Iowa.

**Title:** **Community Accreditation for Produce Safety (CAPS) to Meet the Needs of Small and Mid-Size Farms**

**Author(s):** **Vernon Grubinger**, University of Vermont Extension
Hans Estrin, University of Vermont Extension
Emily Reiss, Vermont Vegetable and Berry Growers Association

This project builds on an established produce safety program designed to helps farms that are exempt from the Produce Safety Rule to adopt best practices that reduce food safety risks. Educational materials, events, and technical assistance focus on adoption of low-cost, scale-appropriate practices. CAPS also offers accreditation for farms that document the implementation of produce safety practices, using an online platform.

Since October 2023, a total of 13 educational events have been delivered, attended by 388 growers. Individual technical assistance was provided 682 times via email, phone and site visits to a total of 189 unique farms.

CAPS accreditation was awarded to 109 farms in 2024. These farms had aggregate production of 2,208 vegetable acres, 322 fruit acres and 1.37million square feet of greenhouse production, representing $33.5 million in annual sales based on U.S. Census of Agriculture data. A total of 59 small farms (with less than 10 acres in production) earned accreditation, and 11 farms were new to CAPS.

A series of “quick guides” titled *Safe, Easy, Low-Cost Produce Handling* is being developed. Six topics covered to date are Container Landing Platforms, Dunk Tanks, Farm Containers, Hand Washing, Managing Dunk Tank Water, and Spray Tables. Ten more guides are planned.

**Title:** **Colorado Fresh Produce Safety Collaborative 2.0**

**Author(s):** **Eduardo Gutierrez-Rodriguez**, Colorado State University
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Joshua Craver
Jake Holley
Dan Goldhammer

Colorado's agricultural sector, vital to the state's economy, benefits from a long-standing history of fruit and vegetable farming and innovation in agriculture including controlled environment agriculture (CEA) and Agrivoltaics, addressing water scarcity, labor shortages, and food safety regulations. These technologies enhance sustainability and resilience amidst climate challenges threatening traditional farming. The Collaborative Education and Training program, launched in response, aims to equip growers with essential skills and knowledge. Building on a 2019 project's success, it focuses on workshops in produce safety, CEA industry assessments, extension materials development, and food safety in Agrivoltaics, emphasizing compliance with evolving standards. The initiative also includes a separate but instrumental Community Outreach project to support small and exempt growers across the state and focus on 3 regions, Grand Junction, Arkansas Valley, and Colorado Springs, crucial to Colorado's agriculture. By continuing to foster our existing collaboration efforts with the industry and leveraging new CEA and Agrivoltaics ventures, it offers innovative solutions to current agricultural challenges, helping growers adapt to labor issues, and safety practices. Expected outcomes are PSA-training, GAP-workshops, Cold-Chain Management, and Post-Harvest Handling. The project aims to support the CO grower associations, translate materials into Spanish, conduct a comprehensive CEA survey, and produce educational materials for Agrivoltaics, including a peer-reviewed publication integrating production with food safety. The Colorado Fresh Produce Safety Collaborative 2.0 program seeks to enhance agricultural resilience and productivity, promoting a sustainable future. By supporting both traditional farming and innovative systems like CEA and Agrivoltaics, it highlights Colorado's dedication to advancing agriculture through education, collaboration, and resource development, the program empowers growers to navigate modern agriculture's challenges

**Title:** **Equipping Small Processors to Thrive in Larger Markets: A Hybrid Approach to Support Training Efficacy**

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Small food manufacturing businesses face critical capacity challenges with workforce, food safety training, and regulatory compliance understanding. Non-uniform state laws addressing food safety practices, differences in the types of products allowable for sale within these states, and insufficient collaboration between states faced with similar compliance and education concerns all contribute to existing challenges for creating holistic trainings that meet the needs of small processors who are subject to no or reduced Food Safety Modernization Act Preventive Controls for Human Foods Rule requirements and also prepare them for the additional training, knowledge, and documentation practices that will be required to expand their businesses to regional markets. Further, since the effort to move education and outreach activities to virtual formats in 2020, Extension educators have identified difficulties bringing producers back to in-person training events. Instead, producers have developed an affinity for virtual training platforms, despite existing research showing that trainee satisfaction ratings and student engagement have been observed to be lower across virtual platforms compared to in-person, suggesting that producers may require additional support to return to in-person training environments. To address this need, the project team developed a hybrid introductory food safety curriculum including a virtual, asynchronous module about state-specific food safety regulations and an in-person, synchronous workshop about basic food safety concepts. The course was piloted in Virginia in October 2024, at which participants increased their knowledge by 21.7%. Of the 41 virtual module participants, 26 attended the in-person workshop (63.4%). Of these, 12.2% (5/26) participants completed the virtual module prior to attending the in-person workshop as intended, with 53.8% (14/26) participants completing the module after the in-person event. Qualitative analysis identified divergent participant preferences for either the virtual or the in-person format, in addition to the capacity of 15 participants to now articulate food safety control strategies (e.g., “There are some pathogens I CAN protect AgAinst (sic) by limiting oxygen and some I CAN feed by exposing or limiting oxygen”). This work was supported by the Food Safety Outreach Program grant no. (2023-03050) from the USDA National Institute of Food and Agriculture. Any opinions, findings, conclusions, or recommendations expressed in this publication/presentation are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

**Title:** **Farmers Trained in FSMA Requirements on the Central Coast of CA**

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

The project addresses an urgent need to provide food safety training support to regional farmers. Objectives include: 1) 64 start-up farm owners gain knowledge and adopt Good Agricultural Practices (GAPs); 2) 76 regional farms strengthen their capacity to comply with FSMA requirements through training and technical assistance; 3) 125 Hartnell College students and field laborers develop knowledge and skills to address gaps in organic farm food safety labor and services, 4) 50 farmer-serving organizations will gain awareness of approaches to food safety assistance and on applying for the Food Safety Outreach Grants Program.

The methods will include culturally appropriate programming using classroom instruction, demonstration, and one-on-one field-based assistance. Lessons will be repeatedly reinforced in the classroom, office, and field to gradually enable farmers to become comfortable with independent food safety management.

To date, results include an estimated 135 farmers gaining knowledge on GAPs and FSMA requirements; 75 Hartnell college students and field laborers developing food safety knowledge and skills; and 10+ outside organizations gaining awareness of approaches to food safety assistance and applying for grant programs.

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

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As competition in produce markets increases, vegetable growers aim to sell to larger institutional buyers with higher food safety compliance standards. New Entry's goal is to create pathways to Food Safety Modernization Act (FSMA) compliance and third-party certification for small and mid-sized specialty crop and organic producers looking to sell to these markets. Targeted outreach and accessible food safety training are essential for small-scale farmers to adopt food safety practices, complete audits and certifications, install required infrastructure, and achieve FSMA compliance. In 2024 and 2025, New Entry staff facilitated our annual Produce Safety Alliance (PSA) Grower Training course with outreach tailored to small-scale farmers in our network. In early 2025, with Massachusetts Department of Agricultural Resources (MDAR) support, New Entry offered a two-part webinar, attended by 20 farmers and viewed 114 times on YouTube, guiding farmers in creating a customized food safety plan that meets industry standards. In 2024, New Entry and MDAR coordinated and performed eight on-farm risk assessments for farmers preparing for Commonwealth Quality Program (CQP) certification, widely accepted by Massachusetts produce buyers. The risk-assessment process helps producers implement CQP requirements and provides tools and food safety plan templates for compliance. Building on this, New Entry staff is working intensively with seven farmers on shared land in Dracut, MA, to create necessary signage, templates, and recordkeeping systems to facilitate CQP compliance. New Entry continues to integrate food safety training into crop production, farm business planning, and incubator onboarding. We share these resources through the New Entry National Network to reach over 2,500 small-scale and under-resourced vegetable producers across the U.S. These programs will improve food safety certification and compliance and increase small-scale farmers' access to institutional market channels.

**Title:** **No Time to TRAIN Produce Workers?...Or in Spanish?**

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Produce farms need outreach and educational materials that support worker health and hygiene, to help farmers to comply with the Food Safety Modernization Act Produce Safety Rule (FSMA-PSR). This will help farms meet minimal standards for safe production, harvesting, packing, and handling fruits and vegetables grown for human consumption. How to showcase current and existing resources to busy farm owners and supervisors is a challenge.

Our team has updated an outreach product to attract farm owners and supervisors and highlight our worker toolkit and supervisor training manual. The original 30” x 40” poster was condensed into a tabletop free-standing retractable poster that is 11”x17”.

Produce TRAINer was created in response to complaints that worker training was too boring, too long, and not specific enough. Our solution includes four short 5- to 30-minute interactive lessons, with materials for both workers and supervisor’s manual, and records templates in English or Spanish, all freely available at the ProduceTRAINer.org website. Revisions were reviewed by Extension Agents and Specialists, regulators, and growers.

This meets a need for concise marketing tools to draw in farmers and supervisors, when Extension Agents, regulators, and industry collaborators are hosting and participating in grower meetings and conferences.

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**Title:** **Culturally Responsive Food Safety Education in Tribal Communities in Oregon**

**Author(s):** **Jared Hibbard-Swanson**, Oregon State University
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OSU Extension has conducts outreach to communities across Oregon to support safe home food preservation that promotes food security and prevents food borne illness. Indigenous communities have a culturally specific approach to food that has not historically been catered to by Extension programs, however, with the result that Native and Indigenous populations have been underserved by food safety outreach and education.

The objective of this project is to increase adoption of safe practices for food preservation within three Native communities in Oregon by creating a culturally responsive adaptation of OSU Extension's home food preservation curriculum, called "Gather, Preserve, Store, Share" (GPSS), and by training a cohort of community food preservation educators in select communities.

Curriculum adaptation was guided by initial consultations with stakeholders in two specific Tribal communities and one diverse Native/Indigenous community. The GPSS working group utilized a Popular Education methodology to scrutinize OSU's Master Food Preserver training and identify problem points in curriculum delivery and content for Native communities, resulting in the development of the GPSS educator training curriculum. PIs developed surveys for trainee community educators at the intake, midpoint, and conclusion of the GPSS program; evaluation surveys were created for participants in public workshops led by GPSS-trained educators.

Between August 2024 and April 2025, 31 trainees took part in the GPSS educator training. GPSS trainees attended 12 training sessions over the year providing critical thinking skills in food safe practices for canning, dehydrating, freezing, pickling, fermenting, freeze drying, and jellying foods. Beginning in February 2025, GPSS-trained educators started offering Native-focused workshops in the three target communities that have attracted more than 50 participants to date.

The GPSS program developed through this project has increased awareness of food safe practices for home food preservation in Tribal communities.

**Title:** **Building Foundations of Food Safety for Beginning Produce Growers**

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Considering food safety in early business development is critical in establishing consistent management practices, choosing infrastructure and equipment investments, making renovation decisions, and other activities that have impacts on the farm business in the long run. For beginning produce growers who are new to fruit and vegetable production, understanding food safety regulation compliance or third party audit certification may be daunting. Specific groups of farmers, including Plain communities and urban growers, benefit from tailored food safety curricula that specifically address their farm needs. The objectives of this project were to offer food safety training, individual farm technical assistance, and develop tailored food safety curricula for beginning produce growers in New York State, with a focus on Amish and Mennonite growers and urban farms. Since the start of the grant in September 2024, we have held 10 outreach events reaching 182 participants. 54 attendees have received Good Agricultural Practices training certificates and 25 earned Produce Safety Alliance Grower Training Course certificates to meet audit or inspection requirements as part of our grant activities. Beginning produce growers have been the primary audience for our trainings thus far, with half (93) of participants identifying as beginning farmers. Two training courses were held specifically for Amish and Mennonite produce auction communities. Outreach with urban growers is planned to begin in summer 2025. The project team has begun developing three new fact sheets for Plain and other beginning growers on the topics of produce cooler best management practices, outhouse waste management, and in-line injection of sanitizers for produce wash water, as well as one fact sheet on food safety concepts for beginning urban growers. The project team’s outreach will continue to prioritize water quality and understanding regulatory coverage and will identify other topics as informed by the project’s advisory group and other stakeholders.

**Title:** **A Collaborative Approach to Provide Food Safety Training and Technical Support to Small and Medium-Sized Food Businesses in Oklahoma**

**Author(s):** **Ravi Jadeja,** Oklahoma State University
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The project, "A Collaborative Approach to Provide Food Safety Training and Technical Support to Small and Medium-Sized Food Businesses in Oklahoma," aims to build capacity in FSMA compliance and internal audit readiness through customized training and hands-on technical assistance. Significant progress has been made toward achieving these goals. Two internal audit workshops have been successfully conducted using the Robert M. Kerr Food & Agricultural Products Center's commercial food facility, providing industry participants with hands-on training in regulatory compliance assessment.

In response to industry needs, a suite of practical training and guidance materials has been developed. These include: (1) cGMP audit checklists aligned with 21 CFR 117 Subpart B and 21 CFR 507 Subpart B; (2) a hazard analysis support document modeled after FDA Appendix 1 for animal food; (3) guidance on detergent and sanitizer use; (4) navigation strategies for supply chain preventive controls and sourcing ingredients through wholesale/online retailers; (5) a comprehensive allergen management program; (6) examples of low-cost traceability programs; (7) practical environmental monitoring and sampling plans for human and animal food; (8) recordkeeping templates and training modules; and (9) integration strategies for FSMA preventive controls with HACCP-based third-party audit requirements to minimize documentation burdens.

The project team has also provided customized internal audits for three small/medium-sized food processors and assisted them in developing FSMA-compliant food safety plans that also meet third-party certification expectations. These tailored interventions have enabled facilities to identify gaps, implement corrective actions, and establish systems for continuous improvement.

This work continues to be informed by feedback from Made in Oklahoma Coalition members and tribal partners, ensuring cultural and operational relevance. As the project progresses, additional trainings and one-on-one assistance are planned, supporting long-term sustainability through peer coaching and extension-led support.

**Title:** **Increasing FSMA Compliance in the North Central Region through Better Connected, Supported, and Educated Stakeholders Who Work with Under-Served Growers and Processors**

**Author(s):** Byron Chaves, University of Nebraska- Lincoln
Arlene Enderton, Iowa State University Extension and Outreach
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Our central hypothesis is that well-prepared and connected educators and regulators will more effectively advise, educate, and regulate small and medium-sized growers and processors. With more targeted and accurate resources, educators will reach more underserved growers and provide equitable assistance for them to reach FSMA compliance. By supporting FSOP awardees, we will contribute to unique and successful outreach projects. Better connected educators and regulators will be more efficient, saving taxpayer money and will enforce FSMA regulations consistently.

Our short-term impact will be increased knowledge for educators, regulators, and non-profit staff; easier access to educational materials; and improved relationships between the network. We expect a long-term impact that includes increased compliance across growers and processors, especially those from underserved and hard-to-reach populations; fewer observations during inspections; and a sustainable network of educators and regulators.

Our methods include holding an annual conference; a fall PD event; processing webinars; regulator meetings; and monthly webinars. We send newsletters, and collaborate with the LRCC, other regional centers, NASDA, PSA, FSPCA, LFSC, IFAI, and FDA PSN to coordinate work. We support our regional FSOP awardees. We develop new resources and provide financial support for our partners. We are partners with NCFSEN.

Our objectives are to:

1. Facilitate communication between educators, regulators, and outreach staff.
2. Facilitate coordination between those working with underserved audiences.
3. Offer specific education/outreach for those who work with produce growers.
4. Offer specific education/outreach for those who work with processors and cottage food operators.
5. Implement actionable assessment and evaluation protocols for the Center and stakeholders.

The 2022 NCR FSMA evaluation report revealed that the produce safety network is “highly valued by partners because they can network, collaborate, and learn together.”

**Title:** **Leveraging Partnerships Among North Carolina Extension Programs to Build Food Safety Educational Capacity and Expand Industry Accessibility to Resources**

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Extension personnel play a key role in supporting local food businesses, as North Carolina is experiencing growth in home food processing, shared-use kitchens, and local food sales. However, evolving regulations, marketing requirements, and novel manufacturing techniques pose challenges in food safety and compliance. This collaborative project aims to enhance educational capacity among extension personnel and those who work directly with businesses to support the local food industry through three objectives: 1) deliver food safety webinars in partnership with state regulatory agencies; 2) conduct a series of in-person workshops across North Carolina on regulations and food safety management implementation; and 3) develop an online repository of food safety resources. In Year 1, a seven-part webinar series, provided in partnership with the state's regulatory programs, reached 157 live viewers and 204 recorded views, thus far. Evaluations showed 94% (n=34) of respondents (N=36) agreed the content improved their understanding. Workshop topics were selected based on industry and extension surveys and approved by an Advisory Board. Beginning in Spring 2025, at least four hands-on workshops will be hosted across North Carolina, featuring regulatory inspectors and experienced food manufacturers. Impact will be measured via post-event surveys. A Food Safety Repository website has been created and provides training materials, funding opportunities, food safety templates, recorded webinars, and regulatory contacts. The repository includes the Farmers Market Food Safety Guide, which was developed in partnership with the advisory board. This Guide has been presented at outreach events and is currently being reviewed and disseminated through the NC Food Safety and Defense Task Force. The Repository site averages 300 monthly visits, with the most viewed content being food safety plan templates. This program is ongoing and seeks to continually improve education and outreach efforts for extension personnel and those who work directly with the evolving food industry in NC.

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

**Author(s):** **Amanda Kinchla,** University of Massachusetts
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There is a strong need for targeted sanitation training for small processors. Although many have received preliminary training (e.g., ServSafe, basic cGMP), they often lack foundational food safety knowledge, limiting their confidence and ability to implement effective, regulatory-compliant sanitation programs. This project, a collaboration among teams from Massachusetts, North Carolina, and Maine, aims to develop accessible, scale-appropriate, and motivating content using a multi-modal approach. The goal is to provide small processors with the necessary information and tools to confidently implement and manage sanitation programs tailored to their facilities and products.

The project seeks to increase the number of processors nationwide who develop, implement, and manage sanitation programs, thereby reducing the risk of foodborne illness and supporting small businesses. To achieve these goals, the project engages with small processors to assess their educational and technical support needs, develop targeted training programs, and deploy and evaluate these programs. The final deliverables include a six-module online training course, a one-day in-person hands-on workshop, and a three-part, one-hour virtual technical support series.

Throughout the project, the team works closely with small processors, facilitated by organizational partners, to ensure the relevance of the sanitation program content and delivery. Over 100 students have participated in the program, and pre/post-survey responses from three pilot locations indicate increased preparedness in almost all sanitation competency categories.

**Title:** **Western Regional Center to Enhance Food Safety: Sustaining a Collaborative Network to Support the Safety of Our Food Supply**

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The Western Regional Center to Enhance Food Safety (WRCEFS) is one of four regional centers in the United States established to strengthen collaboration in food safety education and food industry support related to the Food Safety Modernization Act (FSMA). Since its inception in 2015, WRCEFS has built a robust network of Produce Safety Alliance and the Food Safety Preventive Controls Alliance trainers, delivering extensive trainings across the Western U.S. and educating thousands of growers and food processors on FSMA requirements. Renewed in 2024 for an additional three years, the Center aims to (i) continue expanding regional education and outreach opportunities for food safety trainers; (ii) foster communication and collaboration on food safety challenges and best practices; (iii) support the process for peer review of supplemental training materials; and (iv) evaluate the effectiveness of educational efforts across the Western region. These initiatives are carried out through a coalition of food safety specialists from land-grant universities, Alaska Native-Serving, Native Hawaiian-Serving, and Hispanic-Serving Agricultural Institutions, as well as non-governmental organizations spanning 13 western states and two Pacific territories. In 2025, WRCEFS will host an in-person professional development day in Arizona in conjunction with the annual meeting and will continue engagement with stakeholders through online and in-person meetings, newsletters, and its website. The Center also remains a national leader in coordinating the peer review process for training add-on materials in collaboration with NECAFS and the FSR Clearinghouse. Additionally, WRCEFS is working with the Lead Regional Coordination Center and other regional partners to revise evaluation tools, with updated materials anticipated in 2025.

**Title:** **Developing a Collaborative Education and Training Program to Advance Food Safety for Hmong Growers**

**Author(s):** **Pei Liu**, University of Missouri
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Hmong growers are an essential part of the Upper Midwest's local food system, yet they face persistent barriers to food safety compliance due to language access, cultural differences, and limited training resources. Building on prior FSOP-funded work, this project aims to address these barriers by delivering tailored food safety education that reflects the values, practices, and learning preferences of Hmong farmers.

The objective of this project is to develop and evaluate a culturally sensitive food safety training program for Hmong growers in Missouri and Minnesota, and to produce scalable tools for broader use among socially disadvantaged farming communities.

To date, we have implemented customized food safety workshops for Hmong growers in both states (Objective 1), developed and piloted a bilingual, picture-based Supplemental Food Safety Manual aligned with FSMA guidelines (Objective 3), and initiated one-on-one consultations and farm visits to support growers directly and empower them as community liaisons (Objective 6). Evaluation activities are underway to assess the effectiveness of both the training curriculum and manual, with refinements planned based on participant feedback and regulatory updates (Objectives 2 and 4). Development of a Hands-on Activity Trainer Guide featuring standard operating procedures is currently in progress (Objective 5).

This qualitative study has engaged 16 Hmong farmers through interviews and training, revealing strong preferences for visual aids, instruction in the Hmong language, and community-based learning. Survey data collection (n=120) is also ongoing in Missouri and Minnesota to assess changes in food safety knowledge and attitudes.

Preliminary findings highlight the need for culturally grounded training approaches. This project supports equity in agricultural education by equipping Hmong growers with the tools, confidence, and knowledge to meet food safety standards and support their farming 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
Touria Eaton, Lincoln University

Limited research has addressed the food safety education needs of Hmong farmers, particularly concerning cultural practices, language barriers, and limited access to FSMA-compliant training. This community outreach project aims to establish a culturally responsive produce safety model farm to serve as a dedicated training center for Hmong farmers in Missouri. The long-term goal is to improve food safety knowledge, implementation, and FSMA compliance among this underserved grower population. Specific objectives are: (1) to assess and evaluate training needs for establishing a model produce farm; (2) to develop and implement the model farm; (3) to offer FSMA-guided food safety workshops using the model farm for demonstration-based training; and (4) to provide one-on-one consultations and resources for six pre-recruited Hmong farmers in southwest Missouri.

A multi-phase, community-engaged approach guided the project's design. We conducted in-depth interviews with FSMA-certified trainers (n = 12) and Hmong produce farmers (n = 6) to assess training preferences, cultural considerations, and implementation challenges. Based on this formative research, customized food safety workshops were implemented in Missouri (Objective 3). A model produce safety farm was then established in Missouri as a central hands-on training site (Objective 2). Pilot workshops held in Fall 2023, Spring and Fall 2024, and Spring 2025 featured interactive demonstrations, translated visual aids, and real-world application scenarios. Survey results (n = 6) demonstrated knowledge gains (pre: M = 9.50; post: M = 11.25) and improved food safety attitudes (pre: M = 52.60; post: M = 55.00).

Currently, one-on-one consultations (Objective 4) are underway to support SOP development, personalized food safety plans, and the creation of mini video training modules. This project provides a scalable and replicable model for comprehensive food safety education. It highlights the importance of cultural tailoring in outreach and the potential to advance long-term public health and regulatory compliance.

**Title:** **Food Sovereignty Initiative: Advancing a Resilient Food Safety System for Farmers, Producers, and Food Entrepreneurs**

**Author(s):** Larry Edwards, Lumbee Tribe of North Carolina
Trish Tripp, Artisan Food Solutions
**Jan Lowery**, Lumbee Land Development, Inc.

The Lumbee Tribe of North Carolina (LTNC) established its Agriculture and Natural Resources Department in 2022 to create a resilient, culturally rooted food system focused on sustainability, food safety, and tribal sovereignty. With increasing demand for safe, local foods and growing interest from producers, this FSOP-funded initiative addresses systemic gaps in training, traceability, and technical assistance for underserved tribal communities.
The objective of this project is to establish a vertically integrated food safety program that expands access to training, certification, and food safety career pathways for farmers, food hubs, and community food providers.

The approach includes five core objectives: (1) develop and deliver a Train-the-Trainer (TTT) program to six nonprofit feeding partners; (2) train 80 farmers on commodity-specific post-harvest handling and FSMA compliance; (3) assist 50 farmers with Lumbee GAP certification and implementation of the Provision platform; (4) upgrade food safety programs for six food hubs and one cooperative; and (5) identify workforce needs to inform certificate or degree offerings at local institutions. Evaluation methods include pre/post training surveys, internal audits, and annual assessments to measure impact.

Preliminary results include increased grower participation, a 52-acre expansion of specialty crops, and a 19% increase in produce sales among GAP-certified farms. Expected Year 2 outcomes include $328,000 in local sales and reduced food waste through fresh-cut and prepared meal production. The project also supports the transition of home-based food businesses into certified shared-use space.

This initiative strengthens local food safety culture, empowers Native producers, and lays the foundation for a tribal-led model of food sovereignty and compliance, ensuring safe food from farm to institution.

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

**Author(s):** **Robson Machado**, University of Maine
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Jason Bolton, University of Maine

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 webinar recordings, FFSP resources, examples of FFSPs completed by farmers, and short educational videos. In addition, the project will create 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 this last year of the project, we invited participating farmers to provide a testimonial of their experiences. These over twenty short videos captured so far showcase farms' successes in the program and are in the final editing stages. All outputs 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 2023. More visits were conducted in 2024; some are scheduled for 2025 since we got an NCE for the project. In addition, participating farmers were provided materials for a field handwashing station and 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

Food Safety Capacity Building for Exempt Farms in Texas is designed for exempt, not covered & qualified exempt farmers and the small nonprofits that support them. Project activities provide the basics of on-farm food safety as best practice and as community care for farms selling direct to consumers. The project collaborates with other nonprofits to increase organizational food safety knowledge and capacity in various parts of the state as well as implements a food safety resource hub on the TOFGA website.

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

**Author(s):** Natalie Dyenson, International Fresh Produce Association
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**Jennifer McEntire**, International Fresh Produce Association
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Repeated produce-related recalls and outbreaks due to *Listeria monocytogenes* highlight the need for employee training. With 64% of U.S. farm workers reporting Spanish as their primary language, we developed and evaluated a *Listeria*-focused food safety training delivered in Spanish. The training targeted small- and medium-size farms, produce packing and processing facilities, and others along the produce supply chain in the southern United States. Our long-term aim is to reduce risk of *Listeria* contamination by enhancing the ability of Spanish-speaking farm workers to address key challenges and strategies for preventing *L. monocytogenes*. Our two objectives to achieve this aim were:

1. Increase knowledge and awareness about *L. monocytogenes* among Spanish-speaking produce workers in the southern United States.
2. Increase the capacity to deliver *Listeria*-focused food safety training by creating a Spanish-language train-the-trainer course.

An 8-week food safety training led by three Spanish-speaking mentors was delivered to U.S. produce workers in the southern United States. The training curricula included four live 90-minute sessions and 8 self-paced modules. Knowledge gain and improved awareness were measured at baseline and follow up using an 18-item instrument developed by the project team. In 2024, 22 participants completed the training, with 80% self-reporting increased awareness of *L. monocytogenes* risk and 100% recognizing the importance of proper *Listeria* management in fresh produce operations. Participant knowledge of *Listeria* also improved. Seven of the 2024 training participants volunteered to complete the train-the-trainer course, which is to be offered in 2025. Post-course one-on-one interviews suggested several improvements, such as more time for in-depth discussions during live sessions, use of practical examples during live sessions, and additional case studies. Our findings suggest Spanish-language food safety training has the potential to increase knowledge and awareness about *Listeria*, among Spanish-speaking farm workers hence reducing the risk of contamination and subsequent product recalls and outbreaks.

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

**Author(s):** **Tom McGee**, Organization for Refugee and Immigrant Success

The Organization for Refugee and Immigrant Success (ORIS) operates incubator farming programs with resettled refugee and other immigrant ("New American") beginning farmers since 2008 and launched a regional Food Hub during 2020. Participating farmers must comply with the Food Safety and Modernization Act (FSMA) standards for their produce to be sold to our Food Hub. This project provides linguistically and culturally appropriate food safety training and technical support that allows participating farmers and staff to participate in compliance with FSMA standards. ORIS staff took Produce Safety Alliance (PSA) Grower Training as well as getting Train-the-Trainer certification. Our food safety advisor also developed plans for various food safety situations that would be implemented by the program. Staff, with the assistance of outside trainers, provided multiple PSA training courses to participant farmers. Each farms wash/pack station was substantially upgraded with more sinks, better water access and more sanitary drying racks. Finally, staff conduct water testing and recording keeping for all farms. ORIS staff gained a tremendous amount of knowledge from their PSA Grower Training and gaining Train-the-Trainer certification. This improved staff confidence in coaching and assisting farmers in navigating food safety situations. ORIS staff and farmers were also able to adopt more successful food safety practices in their fields and in our wash/pack houses. All farms have access to higher quality wash/pack stations and all farmers can utilize those spaces and equipment to implement best practices in food safety. Staff can assist farmers and are prepared to train new participants as necessary.

**Title:** **Diversified Farm FSMA Training Initiative**

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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, including converting the curriculum from a slide presentation format to a workbook format with activities. Two pilot trainings have been held (July 2024 in NC, Feb. 2025 in CA). Once the curriculum receives a final FDA review for technical accuracy and alignment with PSR critical learning objectives, the curriculum will meet the requirements as an equivalent training under the PSR. Two farmer trainings will be held in NC in 2025 along with a Train-the-Trainer. The project team is also developing an administration plan to establish a review and monitoring process for curriculum maintenance and distribution after the current grant funding ends in 2025.

**Title:** **Intertribal Produce-Food Safety Training for Farm-Grown and Traditional Foods program**

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

Established in 2001, the WTCAC, with a Board of appointed representatives from each of the eleven (11) federally recognized Tribes in Wisconsin, works on conservation and agriculture issues that are important to the Tribes.

Tribes have seen a resurgence of interest in agriculture, partly driven by the COVID-19 pandemic. During the pandemic, the federal government increased food distribution to Tribal reservations. The Tribes saw that the food quality was not the best and sought an alternative. In 2021, the Tribal Elder Food Box program started to provide healthy, organic, culturally relevant food to Tribal elders, from Tribal producers. By 2024, the program delivered 30,000 boxes of food to all 11 Tribes in Wisconsin. With a growing number of Tribal producers, the need for training was growing.

WTCAC has held Producer Safety Alliance Training in Wisconsin at the Lac Courte Oreilles Ojibwe University, the Ho-Chunk Nation, the Menominee and St. Croix Tribes, in Michigan at the Keweenaw Bay Ojibwa Community College, and in Minnesota at the Fond du Lac Tribal and Community College. Feeding America, a partner in the Trial Elder Food Box program, provided information on requirements for participation in the program for producers. WTCAC PSA training includes the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) on their Model Food Code. The Model Food Code is a regulatory framework that Tribal governments can adopt to regulate food, including traditional and harvested value-added products. GLIFWC provided training on Waawaashkeshi (venison), including anatomy, field dressing, and HACCP Plan.

The WTCAC PSA program has used trainers from the Wisconsin Farmers Union, University of Wisconsin Extension, Wisconsin Department of Agriculture and Consumer Protection, Indigenous Food and Agriculture Initiative, and the Intertribal Agriculture Council.

**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.

We are completing our final workshops for the grant and providing technical assistance to farmers with completion of their FSMA plans and farm food safety assessment. Additional workshop trainings will include, Writing a Farm Food Safety Plan, FSMA Health and Hygiene workshop, and an on-farm workshop detailing farm food safety practices. We are continuing 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
Wesley Kline, Rutgers The State University
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 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.

Two hands-on workshops were held with 34 participants. Attendees built their own portable hand washing stations, assessed wildlife risk in the field, and learned about properly using detergents and sanitizers in place at a produce wash location. Pre and post knowledge tests were given, and participants were asked to identify six goals to achieve within the next three and six months specific to produce safety. Participants showed the most knowledge gain specific to composting and using BSAAO, evaluating wildlife intrusion risks, and the four-step cleaning and sanitizing process, each of these topics showed a knowledge gain of 2.4 out of a scale of 5. Four FSMA PSR web trainings and 10 hot topic webinars have been provided with over 300 participants and 700 views of recorded sessions on YouTube. 38 technical assistance site-visits have been made to participant farms as a follow-up to program participation.

The final year of this project will include one more hands-on training and additional one-on-one assistance.

**Title:** **Oneida Nation Food Safety Outreach Program**

**Author(s):** **Vanessa Miller**, Oneida Nation Food and Agriculture Area

The Oneida Nation is a federally recognized Tribal Nation that has a long history of food sovereignty advocacy as a comprehensive approach to our overall wellness and health. With this, we have a well built and integrated local food system that includes several agriculture businesses: a beef and buffalo farm, an organic farm, an apple orchard, and a cannery. Our goal in this project is to innovatively adapt our food safety training program to promote good and safe food handling by producers, aggregators, traditional hunters, gatherers and direct to consumer sellers, specifically focusing on our youth. This project will develop an augmented reality application learning tool focused tailored to mirror our community's food system to deliver educational modules that connect our young farmers and processors to our lands, foods, and food outlets. This application will include several different teaching techniques, including videos and interactive modules, to keep participants engaged and interested. This project will increase user connection to the foods and medicines specific to our community, including culturally specific foods and medicines that are critical to our identity as Ukwehuwe, such as maple syrup and heirloom white corn. Further, this project will enhance education regarding safe good handling and preparation with foods in our local systems, empowering our youth in safely processing and producer their own foods as a family and community.

**Title:** **A Statewide Collaborative Education Program to Assist Home-Based Food Processors Under the Tennessee Food Freedom Act**

**Author(s):** **Mark Morgan,** University of Tennessee
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Food Freedom Acts and similar cottage laws throughout the United States allow small-scale producers to manufacture “non-temperature controlled for safety” food products prepared in domestic kitchens for sale to consumers without inspection or training. In 2022, Tennessee joined at least five other states which allow home-based production and sales of most shelf-stable foods. However, the Tennessee version includes acidified and low-acid canned foods, which are prohibited in many states and federal laws. The intent of these acts is to foster growth of small businesses and enhance consumer choice. However, lack of oversight increases risks for foodborne illness.

To ensure homemade foods are processed safely, the objective is to provide a state-wide collaborative education and training program for small-scale, home-based producers. Three online courses for home-based food businesses are being created to cover topics including: food safety principles, best practices for safe food handling and processing, sanitation, and hygiene for home-based processors; safe canning procedures; and principles for starting a food business. Training materials and guidance documents are being developed. This program addresses the need for quality food safety education and will provide low-cost, online courses to operators of an unregulated sector of food businesses in Tennessee. This training should also be applicable to small, home-based food businesses from those states with similar Food Freedom Act regulations.

**Title:** **Improving the Food Safety Resource Clearinghouse Search and Content Display Functions to Enhance Access and Shared Knowledge**

**Author(s):** **Elizabeth Newbold**, University of Vermont
Chris Callahan, University of Vermont
Annie Fitzgerald, University of Vermont

Outline: This collaborative project serves a critical need to improve the Food Safety Resource Clearinghouse search and content display functions to support tailored food safety content access nationally.

Objective: This project leverages the Northeast Center to Advance Food Safety's (NECAFS) existing Food Safety Resource Clearinghouse (the Clearinghouse) and adds new and novel work to develop improved search and content display features designed to address current search function deficiencies identified through evaluation of Google Analytics user data.

Methods: To do this new work, first, the project team will complete a comprehensive review of the Clearinghouse's Google Analytics data to identify the top user experience (UX) and information delivery needs. Then, NECAFS will conduct a literature review to guide informational design and will develop content display of educational resources. NECAFS team members and stakeholders will develop taxonomies of key topic areas to catalog resources into dedicated collections.

Results: The user experience and information design changes will be incorporated into the Clearinghouse and shared through NECAFS regional center activities. Resources cataloged under related topic areas will help users understand the relationship between concepts and navigate to resources on them more quickly.

Key Outcomes: Improved search and content display functionality will enhance stakeholder access to educational materials and improve fundamental knowledge in support of those impacted by the Food Safety Modernization Act.

**Title:** **The Northeast Center to Advance Food Safety**

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

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

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

**Author(s):** **Elizabeth Newbold**, 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) noncompliance 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 do 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*:*** **Overcoming Food Safety Educational Barriers within NY Plain Communities**

**Author(s):** **Lindsey Pashow**, Cornell University
Elisabeth Hodgdon, Cornell University
Robert Hadad, Cornell University

New York State is home to the fastest growing Plain Communities in the country. The plain communities consist of many different ordinances of Amish and Mennonites that practices different technology, customs, and agricultural practices. Since each community is different, educational outreach is conducted differently but one common trait is that it requires face to face support. This being farm visits, small grower workshops, and twilight meetings.

One agricultural educational outreach that has taken longer for the communities to adopt are food safety practices. Over the years, Cornell Cooperative Extension educators have worked with the communities to host food safety trainings such as Food Safety Modernization Act and GAP's. However, the majority of growers do not create food safety plans or standard operating procedures (SOP's). This project focuses on adjusting training methods to better fit the community's ability and acceptance for everyday food safety practices on their farm. One such way is creating SOP's for the different food safety practices but not calling it an SOP.

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

**Author(s):** **Nicole Richard**, University of Rhode Island
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Support is needed to help food processors, particularly small and medium-sized operations, comply with the Food Safety Modernization Act (FSMA) Preventive Controls for Human Food (PCHF) regulation. The long-term goal of this project is to build the capacity of Rhode Island food manufacturers to meet FSMA requirements through targeted food safety training and to strengthen the overall food safety system in the state.

To identify key education and outreach needs, an assessment was conducted among Rhode Island food manufacturers subject to the PCHF rule. The survey was distributed both online via email and in a mailed paper format. A total of 56 responses were received, with 43 submitted online and 13 returned by mail.

The most identified areas for further education included conducting hazard analyses and developing effective preventive control strategies. In response to these findings, a training program is currently in development and will be offered both in-person and virtually from June through August 2025.

**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 (CEA), which includes indoor and vertical farming systems as well as soilless methods like hydroponics and aquaponics, has been suggested as an engineered solution to increase productivity per area. However, few resources exist to meet the unique food safety needs of these produce-growing operations. This project aims to bridge this gap by developing a specialized educational curriculum and outreach program for indoor agriculture operations using soilless systems. The primary objectives are: 1) enhancing team expertise and conducting a comprehensive needs assessment to better understand and address the food safety challenges faced by indoor growers; 2) creating a detailed curriculum and supporting materials that align with current regulatory standards and promote safe production practices; 3) organizing Train-the-Trainer sessions to equip extension professionals and service providers with the tools to educate producers effectively; and 4) evaluating the impact and success of the training program through systematic assessment. A needs assessment survey was conducted to gather essential insights into growers' food safety knowledge gaps and current indoor farming practices, with the goal of informing curriculum development. The survey received responses from 64 participants representing indoor farming operations across the United States. Results highlighted significant variation in practices and identified key knowledge gaps, particularly regarding the use of soil amendments and managing animal access to production areas. Notably, only half of the farms with animal presence had pest control programs in place. There was also a clear lack of understanding regarding food safety practices during harvest and postharvest handling of produce. These findings have played a vital role in shaping the specialized food safety curriculum, which is currently being revised by subject matter experts. To further strengthen the project, the team has conducted several site visits to indoor farming operations with graduate students and extension agents, enhancing team capacity. The finalized food safety curriculum and accompanying educational materials will be distributed to growers, educators, and regulators in the coming months via online and in-person training.

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

Authors: Hyun Lee, University of Missouri
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The Deaf and hard of hearing farmers are often operates small and very-small farms and have not been able to access the necessary training to comply FSMA PSR due to the lack of adequate training programs designed for this underserved population as well as insufficient funding and outreach efforts. It is of particular importance to consider cultural sensitivity in designing and delivering a training program for this particular target population, together with the subtle links among the groups in our society. Hence, the goal 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. Three step-by-step approaches (objectives) are established: (1) Development of a culturally sensitive education program on FSMA with emphasis on the introduction to compliance with the Produce Safety Regulations (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. In collaboration with the teachers and experts in deaf education, a culturally sensitive training program is being developed, including streamlined graphics and visual components to increase the learning outcome and retention of the knowledge and practice. Once completed, a total of 90 Deaf and hard-of-hearing farmers from the region (California, Idaho, Oregon, and Washington) will be recruited and trained in collaboration with the partner organizations, including Schools for the Deaf in the region, followed by the program evaluation and dissemination.

**Title:** **Assessing the Southern Regional for FSMA Food Safety Training and Outreach Impacts**

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The Food Safety Modernization Act's Produce Safety and Preventive Controls for Human Foods Rules require training, outreach, and technical assistance for owners and operators of small and medium-sized farms, beginning and socially disadvantaged farmers, small food processors, and small fruit and vegetable wholesale merchants. The Southern Center for FSMA Training is a consortium of 26 institutions enhancing produce safety in 14 southern states and 2 territories through various educational means, including conducting and evaluating standardized courses (Produce Safety Alliance (PSA) and Food Safety Preventive Controls Alliance (FSPCA) Preventive Controls Qualified Individual (PCQI)) targeting the PSR and PCHF. Validated pre/post-tests were given at PSA and PCQI courses to assess short-term knowledge gains from 09/2021- 08/2024 across the region. A qualitative evaluation was conducted with participants of both courses ≥4 months after training to evaluate medium-term outcomes of behavior changes related to food safety practices. PSA (103; 1,555 participants) and FSPCA (12; 169 participants) courses were held across 13 states and 1 territory. PSA post-test scores (20.63; n=1,132) were significantly higher than pre-test scores (15.86; $t=14.24$, $p< 0.01$), indicating a significant increase in knowledge. Of 13 practices included in

the 4-month follow up PSA surveys, the most adopted practices were Implement new or different trainings for employees on food safety/hygiene protocols (54.3%; 100/184) and write or modify farm food safety plans (53.9%; 96/178). Of the seven practices included in the 4-month PCQI behavior change surveys (n=58) the most frequent behavior change was they recommended the training to others (n= 32), followed by Trained employees on FSPCA rules (n=23) and Fine-tuned existing food safety plans (n=22). Members of the SC continues to enhance food safety of growers and processors through short term knowledge gains immediately post training, and medium-term behavior changes of food safety practices.

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

**Author(s):** **Keith Schneider**, University of Florida
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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 20 institutions aimed at enhancing produce safety in 13 southern states 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 and on May 31-June 1, 2023 in Tampa, FL. A third meeting is scheduled for May 28-29, 2025 in Tampa, FL.

**Title:** **An Integrated Approach to Developing Extension Outreach Curricula for Home Food Preservation, Retail Food Safety, and Cottage Foods: A Food Safety Extension Network Effort**

**Author(s):** **Carla Schwan**, University of Georgia
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The Food Safety Extension Network (FSEN): Supporting Consumer, Retail and Home-based Businesses has identified gaps in food safety training for non-traditional clients (e.g., home-based food producers/cottage foods operations) in the Southern Region. Food safety training in home food preservation, retail, and cottage foods/small food businesses becomes a foundation for clients who often become interested in starting a new food business/cottage food or want to immerse themselves in the food retail arena. As part of producing, handling, and selling foods, food entrepreneurs and retailers are required to follow food safety regulations to comply with state and federal laws. However, food safety regulations can be challenging for new food entrepreneurs who cannot easily understand and access this type of information: therefore, hindering their ability to comply with these regulations and successfully launch a food business. A hybrid train-the-trainer curricula for Extension agents in the areas of home food preservation, retail food safety and cottage foods/small food business is being developed to be used across member institutions of the Food Safety Extension Network and beyond. These curricula will fulfill the gaps of FSMA-related food safety training, education, and Extension programs utilized by Extension agents, associates, or specialists to reach non-traditional clients, such as home-based, retail, and small food businesses. This Collaborative Education and Training Project is anticipated to reach 300 Extension agents in the areas of home food preservation (80 participants), Retail food safety (100 participants), and cottage foods/small food businesses (120 participants) throughout multiple states in the Southern Region and beyond.

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

**Author(s):** Byron Chaves, University of Nebraska
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**Angela Shaw**, Texas Tech University
Phil Tocco, Michigan State University

This regional center project is currently in a no-cost extension, to finish several last projects. The NCR FSMA received another grant that began in September 2024, which is funding most of the center's work.

With the no-cost extension, we are continuing outreach to underserved populations, including a tribal group.

We intended to provide education to educators and regulators about the finalized pre-harvest water rule. Because it was not announced until May 2024, we didn't have time to provide that education during the original grant cycle. Our fall professional development event in October 2024 focused on the new rule. Educators and regulators gathered in Novi, MI, to get updates on the rule, visit farms to discuss their water systems, and participate in water testing.

On the processing side, we are planning to fund Chaves' attendance at the Juice HACCP course, which wasn't offered during the original grant cycle. He will plan to offer the course to the region after the train-the-trainer course.

The objectives of the 2021-2024 grant cycle are:

**Objective 1:** Expand the produce safety network within the NCR
**Objective 2**: Collaborate with and support the NCR produce safety network partners
**Objective 3:** Create, modify, and validate safety training programs based on a needs assessment
**Objective 4**: Professional development and technical assistance of NCR produce safety educators, growers, and processors

**Title**: **Expand the Current Food Safety Modernization Act Training Program for West Virginia Very Small Local Produce Growers with the Content of Triple-Wash and Related Outreach Activities**

**Author(s):** **Cangliang Shen**, West Virginia University
Lisa Jones, West Virginia University

This community outreach project aims to develop a systematic community training program to encourage the adoption of the triple-wash process among very small local produce growers in West Virginia. Since the high percentage of Salmonella and Listeria spp. were detected on fresh produce sold at WV farmers markets than the existing published data from other states, WV Small Farm Center encourages very small local produce growers to apply the triple-wash with antimicrobials to produce surfaces if their produce is eaten raw or grown close to the ground. A serial validation studies completed by the PD's research team suggest that applying triple-wash with commercial antimicrobials is an effective and economic-feasible approach for very small local produce growers to reduce foodborne pathogens on locally grown produce including butternut squashes, cucumbers, tomatoes, and spinaches. Therefore, the objectives are: 1) Conduct a survey of WV very small, local produce growers' current pre- and post-harvest practices related to the root cause of microbial contamination on fresh produce and their knowledge of FSMA produce safety rules; 2) Conduct in-person plant onsite workshop or remote training course of triple-wash for very small, local produce growers as a supplement for FSMA "train the trainer" workshop; 3) Develop a handbook of triple-wash for WV very small, local produce growers. Results will In our 2$^{st}$ year of the grant period of time we completed 1) complete and published the survey article related to applying triple-wash methods to improve microbial safety of locally grown produce among 85 very small fresh produce grower in WV; 2) drafted a 15-page triple-wash produce manual which is under review by WVU extension service; 3) The PD and the Co-PD joined the WV fresh produce safety team and taught the FSMA produce safety courses with online/remote and in person format and included triple-wash material as a supplement for the FSMA train the trainer course. This project will expand the current FSMA trainings to WV very small local produce growers, improve their food safety knowledge, and encourage their implementation of on-farm post-harvest best practices to reduce microbial safety risks of their produce.

**Title:** **Young Farmer Food Safety Education Project: Developing and Implementing Food Safety Outreach Activities for West Virginia High School Horticulture Instructors as Supplement to the Farm-to-School Program**

**Author(s):** Nettie Freshour, West Virginia University
**Cangliang Shen**, West Virginia University
Kristen Matak, West Virginia University

This community outreach project aims to develop a systematic food safety training program and standardized operating procedures for high school horticulture program instructors involved in the farm-to-school (FTS) program and those selling produce to their local communities. The FTS program as well as local agriculture have attributed exponentially to the economic growth in West Virginia. Local farmers involved in the FTS program are required to take food safety training; however, no training has yet been established for those horticulture programs providing produce to their respective schools. Therefore, the objectives of this project are: 1) Conduct a survey of WV horticulture program instructors on knowledge of microbial contamination on produce, FSMA produce safety, and GAPs; 2) Review and develop standard operating procedures (SOPs) to ensure accurate standardized processes amongst high school horticulture programs; 3) Curriculum and schedule development for on-site workshops and the remote “train the trainer” modules for high school horticulture instructors. In our 1st year of the grant period of time we completed 1) design the draft of questionnaire used for surveying WV high school horticulture program instructors’ knowledge of FSMA related produce safety regulations; 2) completed a 15-page long produce safety training manual related to SOPs and Quality Control; 3) Created 6 15-30 min training module related to food borne pathogen and fresh produce microbial safety. This project will supplement the FTS program as well as enhance the microbial quality of food and decrease the risk of microbial contamination on produce from school gardens.

**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. Local culturally appropriate food safety education and outreach efforts are 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.

In collaboration with tribal Extension agents and tribal collaborators, we identified specific food safety training priorities to develop and implement culturally appropriate integrated food safety education and outreach programs for tribal communities in Arizona. For this reporting period (2024-2025), the project team and collaborators conducted one in-person and five virtual PSA Grower Training courses with over 20 tribal growers/producers acquiring completion certificates. We taught 13 food safety related workshops on tribal lands and reached about 350 participants from at least 5 tribes. In one program, the average level of participants' knowledge of food safety increased by 61.3%, based on self-assessed pre- and post- evaluation, and 64% of participants reported adoption of new food safety or IPM practices. Additionally, we mentored three tribal student interns (up to 6 months internship) and two tribal employees on food safety and IPM, and supported three tribal collaborators to become certified PSA Trainers. We completed 7 project-related presentations/abstracts at state, regional or national conferences and meetings.

In summary, we expanded on existing relationships to deliver integrated food safety education to tribal communities, improved awareness and knowledge of food safety practices to protect public health and reduce food-borne illnesses, and improved engagement with underserved stakeholder audiences challenged by food safety issues.

**Title:** **FSMA Traceability Requirements in Retail Food Establishments: Development of an Educational Training Program**

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The Food and Drug Administration (FDA) recently published the Food Traceability Rule as part of the implementation of the Food Safety Modernization Act (FSMA), which requires additional recordkeeping for entities that manufacture, process, pack, or hold particular foods that are part of FDA's Food Traceability List. This means that FSMA now applies to retail establishments and restaurants, entities that thus far have only been regulated under their jurisdiction's Food Code. The retail food industry needs a rapid solution to learn about the requirements for this traceability rule and the best way to implement practices to adhere to the newly applicable legislation. This project aims to fill this gap with the development and delivery of a hybrid educational program specifically for the retail food industry to improve understanding and assist with implementation of the Food Traceability Rule. This will be accomplished using two objectives: 1) developing and implementing a traceability training program with a focus on small retailers and 2) developing and implementing an evaluation plan to assess effectiveness and impact of the training program. This project is anticipated to reach approximately 525 retail and food service operators across the U.S, with a focus on small and hard-to-reach operators. Curriculum development is currently underway, which will be informed by a needs assessment survey and focus group with stakeholders to ensure the curriculum will meet needs of retailers. Those who attend the training will learn about the key details of the Food Traceability Rule, develop valuable skills to apply information to their establishment, and understand how to work with their supplier for mutual compliance with the new regulation.

**Title:** **Development of Produce Safety Educational Material for Small Beginning Underrepresented and Underserved Farmers**

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Although there is a wealth of produce safety educational material, educational resources that cater to underrepresented/underserved small beginning farmers are limited. The overall objective was to identify the needs of small, underrepresented/underserved beginning farmers and develop produce safety educational material based on virtual focus group feedback. The team developed questions to recruit underrepresented/underserved small farmers for the virtual focus group. The questionnaire was designed to ensure that the focus group consisted of farmers that grew a variety of produce. Based on the project's Advisory Board's recommendations, the initial questions were revised and used in the recruitment application and the flyer was developed and circulated. From the review process, eight applicants were selected from Alabama, North Carolina, and South Carolina. As a training opportunity, graduate students enrolled in a Produce Safety class at Alabama A&M University attended the virtual focus group. Focus group participants indicated that training material on the use of sanitizers and recording keeping along with a training manual specifically for small beginning farming operations were needed. As a result of this, the process of developing produce safety training material was started by graduate students enrolled in the Produce Safety course. The topics included the proper use of sanitizers commonly used in small operations and record keeping. Students brainstormed ideas and developed an initial draft of the educational material. The material was reviewed by some members of the Advisory Board. The proposed work is innovative in that it focuses on creating educational material for underrepresented/underserved beginning farmers that are relatable to them while also training graduate students in the area of produce safety. These materials will be beneficial to small beginning farmers interested in gaining knowledge in produce safety.

**Title:** **Food Safety Training for Cottage Food Processors**

**Author(s):** **Stephanie Smith**, Washington State University
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There are over 400 cottage food processors in Washington, and the cottage food processing industry continues to grow, both in Washington and nationally. Foods produced under cottage food laws have generally been deemed low risk, but as this industry grows, states are allowing processing of a wider variety of foods and significantly higher food sales. Food safety training requirements in this industry range from none to a couple of hours, and this industry has remained overlooked for food safety training. Our overarching goal is to develop food safety training for this industry, which can be adopted by educators in other states, to improve food safety education and implementation in this sector. We conducted a thorough assessment of the gaps that exist in the cottage food systems and used this assessment to identify core needs for enhancing food safety in this industry. We are designing educational content focused on specific GMPs, simplified cleaning and sanitation practices, simplified hygienic zoning, allergen ingredients and best practices for allergen management, prevention of allergen cross-contact, and food safety training for controlling unique and potential hazards for foods processed within the cottage foods sectors. We will deliver in-person and online training for cottage food processors and those wishing to enter the cottage food processing sector. By providing food safety training to the cottage food processing business, we can improve the safety of foods produced, protect public health, and protect cottage food operators from the financial burden of a food recall.

**Title:** **Expanding Food Safety Resources for Small and Mid-Size Processors of Low Moisture Foods**

**Author(s):** **Abigail Snyder**, Cornell University
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Kim Bukowski, Cornell University
Louise Felker, Cornell University

Low moisture foods (LMF) represent a broad section of the food. The methods for ensuring safety in these foods have been an area of increased focus due to (1) recent, prominent outbreaks and recalls in this sector and (2) the growing body of research highlighting the unique food safety challenges in these systems. Food safety systems for LMF processors often differ substantially from high water activity foods. This poses a barrier to implementation of food safety regulations and transmission of food safety education among this specialized group. This is especially true for small and mid-sized businesses who often lack the resources and technical expertise to adapt conventional training materials to their particular needs, including training on the Preventive Controls for Human Food (PCHF) Rule of FSMA. Existing curricula including PCQI training does not adequately address the needs of this specialized group. Our project helps to fill this gap by (1) Developing educational resources specific to small and mid-sized LMF processors. (2) Offer training and tools virtually and in-person to increase our reach. (3) Evaluate outcomes. Our project kicked off 3 months ago and we have conducted some initial outreach training courses and have a workshop series planned for this summer.

**Title:** **Pacific Food Safety Education and Training Collaborative**

**Author(s):** **Dave Stone,** Oregon State University
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The goal of the Pacific Collaboration is to engage remote communities across the Pacific in food safety education and training that is relevant to their location and need. Pacific islands face several challenges in food safety including limited access to experts, unique and evolving pest pressures, climatic events and supply chain restrictions. A cohort of food safety experts from six institutions in the Western U.S. and Pacific have partnered with the Western Regional Center to Enhance Food Safety to adapt and build educational materials and deliver customized training. The Collaborative has the following objectives: 1) to convene the Pacific Food Safety Education and Training Collaborative to address food safety issues among partners across the Pacific: 2) adapt existing curricula and develop new educational materials to address specific issues; 3) conduct an on-line train-the-trainer series and in-person training workshops; and 4) evaluate the impact and utility of the trainings. In year two, we have completed the on-line training series, educating over 50 professionals in Guam, the Republic of the Marshall Islands, American Samoa, Hawai‘i, the Northern Marianas Islands and the Federated States of Micronesia. We’ve completed three in-person workshops to date, with several additional trainings planned in year 3. At the conclusion of the on-line and in person trainings, we assessed participant increase in knowledge gain, as well as their intent to adopt new behaviors in their programs. The overall outcome of these engagements is to advance economic prosperity and resilience, while improving their recognition and mitigation of food safety issues.

**Title:** **Enhancing Food Safety Training Capacity to Support Hawai‘i’s Small Processors and Sprout Growers**

**Author(s):** **Kylie Tavares**, University of Hawai‘i at Mānoa
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Hawai‘i’s food processors, manufacturers, and sprout growers face significant challenges in accessing education and training for compliance with the Food Safety Modernization Act (FSMA). With hundreds of food businesses in the state, there are currently only two Preventive Controls for Human Foods (PCHF) Lead Instructors and no Sprout Safety Alliance (SSA) trainers, leaving a critical gap in local training capacity. The objective of this project, led by the University of Hawai‘i (UH) Cooperative Extension, is to develop sustainable local training and education programs to support FSMA compliance for Hawai‘i’s food industry. The project team will identify and train eligible food safety educators from UH, state agencies, and community organizations to achieve this. These educators will complete SSA grower training and PCHF courses and apply and complete courses to become Lead Instructors. Additionally, established Lead Instructors from partner institutions will co-teach with new trainers to enhance the skills and content knowledge of the Hawaii team. In Year 1, Extension Agents and a Hawai‘i Department of Agriculture partner began the SSA and PCHF trainings. The project has also successfully involved instructional and research faculty at UH with food science backgrounds to complete the PCHF participant course and agree to join our local training team. This project is underway to develop Lead Instructors to provide stable local training capacity, foster community partnerships, and improve public health by ensuring a safer food system by supporting FSMA compliance in Hawai‘i.

**Title:** **Crowdsourcing a Media Library: Creating a User Generated Media Library for Education and Outreach**

**Author(s):** **Phil Tocco**, Michigan State University
Kristin Woods, Tuskegee University
Chris Callahan, University of Vermont

The PDs regularly receive requests for images that demonstrate practices and equipment that cannot be found in traditional searchable image libraries, or which have other permission and use constraints. Given the shift to remote trainings in recent years, trainers have become heavily dependent on images. This increases the need for a curated searchable produce safety media library. To alleviate this need, we are creating a searchable image library with tagged images and short film clips with ADA compliant alternative text and appropriate media attribution. This will be fully integrated with the National Food Safety Clearinghouse for ease of access.

We have created an advisory group that has met twice. The advisory group prioritized the needs of their clients. We implemented an ongoing survey instrument to gauge stakeholder awareness and involvement in the process.

We are in ongoing talks with the chosen digital consultant and organizers of the National Food Safety Clearinghouse. The consultant is actively creating architecture that will support the submission of files.

We hope to be ready for pilot submissions by September 2025 with a “go live” date of January 2026.

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

**Author(s):** **Sharon Wages**, University of Hawai‘i at Mānoa
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Outline: Nationally, Asian American and Pacific Islander 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 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.

Methods: We will translate the WIFSS supplementary FSMA-PSR e-course and associated resources into Ilocano and Mandarin for AAPI growers in Hawaii and California as well as identify and address gaps in course curricula and content by obtaining feedback from stakeholders and lastly migrate 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.

Results: 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**

**Author(s):** **Sharon Wages**, University of Hawai‘i at Mānoa
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Outline: 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 3 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.

Objectives: 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.

Methods & Results: To date 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 can begin the process of material review by peer groups.

**Title:** **Empowering Faculty and Staff from Minority-Serving Institutions to Successfully Write Grants**

**Author(s):** **Angela Walla,** Texas Tech University
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Christine Strohm, Engineering and Science Editors

Minority Serving Institutions (MSIs) were established in response to historical racial and ethnic inequality in access to higher education. MSIs have are dedicated to educating and investing in underserved communities throughout the U.S. Although there are new initiatives to support MSIs in their efforts to write successful proposals, a paper published in 2021 highlighted that MSI faculty encounter many challenges when writing federal research proposals (Guerra, 2021). The authors highlight that MSI faculty tend to have higher teaching loads, leaving very little time to look for funding opportunities, write proposals, and conduct funded research. Many MSIs also do not have the infrastructure in place to support faculty as they write grant proposals or to help with the administration of funded projects. Our proposal aims at reducing some of the burdens placed on MSIs faculty and staff through the development of an accessible grant resource toolkit, professional development education and training, and technical assistance. These resources will assist MSIs food safety specialists in developing grants. The following are outcomes of the grant: 1) We established a grant project website (https://www.depts.ttu.edu/research/usda-grant-writing/); 2) Two listservs of minority-serving institution grant writing participants (461 contacts); 3) Twenty YouTube videos on various topics of grant writing are available on the YouTube Channel FSOP Grant Writing (300 have viewed these thus far); 4) a 10 week Summer Grant Writing Group Series occurred in 2024 with 20 MSI faculty signed up for the weekly 3-hour sessions and accountability group; 5) five templates for the 2024 FSOP Grant RFP (i.e. Collaborative Education and Training, Community Outreach, Lead Regional Center, Regional Center, and Technical Assistance); and 6) technical assistant hours and sessions were conducted for the 2024 FSOP RFP call. In the remaining year of the grant, we will have a Summer Grant Writing Group in 2025, a webinar, and technical assistant support for the 2025 FSOP RFP and other 2025 USDA grants.

**Title:** **FSMA Training Cohort for Small Georgia Food Producers**

**Author(s):** **Wendy White**, Georgia Tech GaMEP

Comprehensive FSMA training, which incorporates one-on-one support, is urgently needed for small food producers. This FSOP will leverage existing partnerships and forge new state-wide collaborations with various organizations to reach these populations across Georgia. Existing FSMA training materials will be refined to create a six-day workshop series utilizing a cohort model in which individuals from different companies participate together in a collaborative environment. Each of these classes will be held two-three weeks apart to allow for individual coaching calls to be scheduled with each company between each class. This will give the students time to absorb the material, conduct work on their food safety plans, ask questions, and receive individualized support. This cohort model has been used successfully in the past and many companies were able to finish the workshop with an FSMA-compliant food safety plan. Quarterly webinars will supplement the training. A needs assessment will be deployed prior to finalizing the curriculum, pre and post-tests and class surveys will be given during the workshops, and a survey will be delivered six to twelve months afterwards to assess the long-term economic impacts from the project. Class materials, anonymized student data, project learnings, and best practices will be shared through various channels. The goal is to provide customized training in a cost-effective manner which ensures FSMA compliance. In Year One, we developed a curriculum and training materials, as well as taught two cohorts, training 17 individuals, and conducted quarterly webinars on various subjects (labeling, acidified foods, etc.). In Year Two, we are currently conducting our first cohort with 27 students and have two more planned.

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

**Authors:** **Wendy White**, Georgia Tech GaMEP
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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. This FSOP will form a multi-state collaboration between the Georgia Institute of Technology, Fort Valley State University, and Puerto Rico Manufacturing Extension, Inc., leveraging existing outreach relationships to focus on these communities; no one was excluded from participation. An introductory food safety (FSMA) and business development curriculum will be developed, and training deployed to GA and PR food founders 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 who will continue to deliver this training far past the project parameters. The training effectiveness will be evaluated, impacts collected, and all learnings and project materials (English and Spanish) will be shared. The 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. In Years One and Two, the English curriculum and materials were developed and 12 Food Entrepreneur classes given to 264 students and three TTT classes were taught to 31 students. In Year Three, the curriculum and materials have been translated into Spanish, and we have already trained 89 students in two (out of five planned) Food Entrepreneur classes with two TTT classes planned. A total of 362 Food Entrepreneurs have been served; 73% from traditionally underserved or insular populations.

**Title:** **Enhancing Food Safety for Underserved Farmers in Rural Mississippi**

**Author(s):** **Darnella Winston**, Mississippi Association of Cooperatives
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More than 29 million Americans live in “food deserts,” which means that they do not have a supermarket “within a mile of their home if they live in an urban area, or within ten miles of their home if they live in a rural area. On top of the absence of these markets, limited mobility, economic barriers, and a lack of fresh food options prevent certain low-income communities from obtaining healthy and affordable food. Food safety systems are becoming a common requirement for doing business throughout the food supply chain. The first step for small and limited resource farmers is to become educated about the food system globally and recognize the issues in their own community! For this project, MAC worked with 200 small and limited resource farmers from six Mississippi counties to provide food safety outreach coordinate services of university extension, FDA, consultants, and youth for classroom training in local communities that have not been address; develop a marketing plan for fruit and vegetable farmers; provide technical assistance to farmers on becoming certified in good agricultural practices and assist farmers with the costs of certification. Staff also developed a peer training program to reduce the need for external trainers. Key outcomes include an increase in food safety knowledge, increase in GAP certified farms; and more marketing plans to enhance the viability of farming operations.

**Title:** **Minimizing Postharvest Loss, Improving Product Quality, and Food Safety in the Black Belt Food Corridor**

**Author(s):** **Kristin Woods**, Tuskegee University
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Tuskegee University, Alabama A&M University, and Auburn University are collaborating to develop a value-added curriculum aimed at minimizing postharvest loss, improving product quality, and enhancing food safety for small, limited-resource growers in the Black Belt region. This initiative, inspired by George Washington Carver's legacy, seeks to equip farmers with crucial technical skills in cooling, sorting, grading, and packaging through impactful experiential learning. Building on the foundational content of the "Small-Scale Postharvest Handling Practices: A Manual for Horticultural Crops" from UC Davis and the innovative approach of the 2019 USDA FSOP-funded Mobile Farm Innovation Project, this project specifically addresses postharvest challenges. The core objectives include developing comprehensive curriculum materials to support these goals, piloting the hands-on program with Black Belt farmers, rigorously evaluating the effectiveness of the piloted materials, finalizing and widely disseminating the resources. Furthermore, the project emphasizes capacity building within the 1890 and 1862 Land Grant System and the Black Belt farming community, actively engaging the next generation of food safety professionals and farmers throughout material development and implementation. To date, we have convened our advisory group, incorporating valuable insights into the project's direction, and have produced a rough draft of the first factsheet which focuses on greens.

**Title:** **Food Safety Education and Support for Hawai‘i’s Beginning Farmers**

**Author(s):** Kyle Barber, University of Hawai‘i
Laura Ediger, University of Hawai‘i
**Janel Yamamoto**, University of Hawai‘i

GoFarm Hawai'i, a statewide agricultural extension program under the University of Hawai'i's College of Tropical Agriculture and Human Resilience (CTAHR), has initiated a project focused on enhancing food safety knowledge and implementation among Hawai'i's farming community. Many small-scale operations in Hawai'i currently function without significant regulatory oversight or formal food safety training, posing potential risks to consumer health and limiting their market opportunities. Recognizing this gap, GoFarm Hawai'i leverages its extensive statewide network and community outreach capabilities to effectively disseminate essential food safety practices. The primary objective of this initiative is to systematically incorporate guidelines from the Food Safety Modernization Act (FSMA) and Good Agricultural Practices (GAP) into targeted educational curricula tailored specifically for Hawai'i's unique agricultural context. The project aims to directly engage 400 farmers, primarily targeting new and beginning producers. Additionally, a dedicated food safety resource webpage will be developed on the GoFarm Hawai'i website, providing farmers continuous access to essential information, including customizable signage templates, indigenous crop food safety resources, and guidance for conducting effective water sampling. Project implementation will involve the development of updated curricula reflecting current FSMA and GAP standards, delivery of interactive farmer-centered workshops statewide, and individualized on-farm assessments designed to translate theoretical knowledge into practical, operational improvements. Anticipated outcomes include measurable improvements in participants’ knowledge and application of food safety practices, leading to enhanced produce safety, increased consumer trust, and strengthened farm sustainability. The project's success has significant potential to positively impact public health outcomes and improve economic viability and market access for local agricultural producers across Hawai'i.

**Title:** **Bridging Gaps, Building Futures: Empowering Students as Food Safety Ambassadors for Farmers and Small Processors in Southern California**

**Author(s):** Michelle Tu, Cal Poly Pomona Foundation, Inc.
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**Xu Yang**, Cal Poly Pomona Foundation, Inc.

Currently, there is no existing educational curriculum at Cal Poly Pomona (CPP) to adequately train students on the Produce Safety Rule (PSR) and Preventive Controls for Human Food (PCHF). Additionally, the diversity among farmers and food processors in Southern California, coupled with the prevalence of small-scale operations, highlights unique food safety training needs.

The overall objective of this project is to provide food safety training to CPP students, local urban farmers, and small processors, ultimately coupling CPP students and local stakeholders with micro-internship opportunities.

The project began by integrating PSR and PCHF training components into the educational curricula for CPP students. CPP will be offering the new PCHF 2.0 curriculum during the summer of 2025 to CPP students and local participating small processors. The initial cohort of food safety student ambassadors has been selected and paired with the local food industry. The goal is to provide our stakeholders with food safety assistance through micro-internship opportunities with our trained ambassadors.

Although still within the first year of project execution, the preliminary data is promising. Institutional review board approval has been obtained, and the PSR and PCHF training curricula have been designed. The PCHF 2.0 training has been announced, and so far, we have nine registrants from the local food industry and CPP students. Additionally, three students have been hired through the grant as food safety ambassadors and are about to begin their food safety assistance with the local food industry.

The outcomes are multi-dimensional: CPP students gain invaluable food safety training from the revised curriculum and practical experience from urban farmers and small processors, enhancing their career prospects. Simultaneously, local food companies, farmers, and growers benefit from cost-effective, language-specific expertise, selecting students who resonate with their unique contexts.

**Title:** **Closing 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

The Lower Rio Grande Valley (LRGV) is a vital agricultural hub and one of the largest entry points for fresh produce imports in Texas. However, many small and mid-size growers in this region, particularly those practicing organic and sustainable farming, lack access to culturally and linguistically tailored food safety education. To bridge this gap, we developed and implemented a bilingual produce safety outreach program focused on hands-on training, technical assistance, and industry-recognized certification support. Through collaborative efforts with various community-based organizations, we conducted 10 bilingual workshops, reaching more than 200 grower communities. Our training emphasized practical farm food safety strategies emphasizing pre- and post-harvest risk assessment and assisted growers in developing farm food safety plans. Additionally, we established a regional training network by developing nine new trainers and one train-the-trainer. A webinar on USDA-GAP certification requirements was conducted in collaboration with National Farmers Union-Local Food Safety Collaborative, further expanded outreach efforts. Assessment of impact of this program indicate that participants found the workshops highly useful, with significant improvements in their understanding of farm food safety practices. Many attendees expressed a strong likelihood of implementing learned practices on their farms. Ongoing efforts include one-on-one technical support, and follow-up surveys to assess long-term behavioral changes. By addressing critical educational gaps, this project contributes to a safer and more sustainable food system in the LRGV. Our approach serves as a model for improving food safety education in underserved agricultural communities nationwide.

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

**Author(s):** Jessica Fish, Cankdeska Cikana Community College
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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 micro credentials 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.

In partnership with North Dakota State University, CCCC 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.