Development of Add-on Materials to Supplement Food Safety Modernization Act Trainings in the Western U.S.

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Development of Add-On Materials to Supplement Food Safety Modernization Act Trainings in the Western U.S.

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INTRODUCTION

The Western Regional Center to Enhance Food Safety (WRCEFS) is one of four regional centers established in 2015 to assist Extension educators and food industry professionals with training programs and outreach relevant to the Food Safety Modernization Act (FSMA). It encompasses 13 states and two territories, representing more than half the land mass of the United States and over 50% of the specialty crop market value (USDA, 2015; WRCEFS, 2015). To accommodate a wide variety of agricultural systems, WRCEFS is divided into four sub-regions (Figure 1). From 2015 to 2018, WRCEFS activities largely focused on the professional development of credentialed trainers in the Western Region to deliver certified Produce Safety Alliance (PSA, 2020) and Food Safety Preventive Controls Alliance (FSPCA, 2020) trainings. During this time, the need for supplemental materials, referred to as “add-ons,” to reflect region-specific agricultural production and processing systems was identified across the regions (Fouladkhah, 2017; Strohbehn et al., 2018). To help identify key topics of interest for the add-on material development, WRCEFS organized special sessions during the 2017 annual meeting. In this article we describe the topics that were prioritized and the materials that were subsequently developed to supplement the standardized curricula for FSMA Preventive Controls for Human Food (PCHF) and Produce Safety Rule (PSR). These resources were developed for PSA and FSPCA trainers (e.g., >700 PSA trainers; >250 FSPCA trainers in the Western Region).

PRIORITIZATION PROCESS FOR THE DEVELOPMENT OF ADD-ON MATERIALS

Representatives (n = 52) from 13 Western states and two territories, other regional centers (Northeast, North Central, Southern), the Alliances, federal and state government agencies, and non-governmental organizations (NGOs) attended two breakout sessions at the WRCEFS annual meeting in March 2017 in Honolulu, HI (Figure 2). Breakout sessions were focused on preventive controls or produce safety topics. An identical format was followed with participants divided into eight groups of four to eight people per group. Each group was given 25 minutes to brainstorm, discuss, record, and report: (1) add-on topic and/or sub-topic; (2) suggested format; (3) target audience; and (4) learning level (beginner, intermediate, advanced). A total of 25 preventive controls, 39 produce safety topics, and 16 model food safety plans (FSPs) were identified. Of these, eight add-on projects and two FSPs were funded and completed (Table 1). Additional topics that were identified as important but have not yet been addressed through WRCEFS projects are listed in Table 2.

Abstract. During the 2017 annual meeting of the Western Regional Center to Enhance Food Safety, 52 representatives from 15 western states/territories, regional centers funded through USDA-NIFA Food Safety Outreach Program, federal and state government agencies, and non-governmental organizations prioritized topics for the Food Safety Modernization Act (FSMA) training materials that address region-specific agricultural production and processing systems. This article describes supplemental materials or “add-ons” developed to support FSMA-related food safety trainings. Although the materials were developed for the western region stakeholders, they can be applied or adapted to other regions in or outside the U.S. to enhance food safety trainings.
**Figure 1.** Sub-regions and lead institutions of the Western Regional Center to Enhance Food Safety.

**Figure 2.** Breakdown of representatives by organization type that participated in the prioritizing and development of add-on FSMA teaching materials for the Western Region (n = 52).
### Table 1. Prioritized Add-On Topic Areas with Preventive Controls or Produce Safety Focus

<table>
<thead>
<tr>
<th>Topic areas prioritized</th>
<th>Completed projects format and source link(s)</th>
<th>Views/downloads&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focused on preventive controls</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Simplified Preventive Controls for Human Food (PCHF) training for small scale processors | Pre-PCQI workshop  
Teaching slides, in-person delivery  
https://agsci.oregonstate.edu/wrcefs/resources | Not individually tracked |
| Pistachio process validation | Guidelines for using *Enterococcus faecium* NRRL B-2354 as a surrogate microorganism in pistachio process validation  
| Value-added on-farm processing in California | California cannery license program  
Processed food registration in California: permit Timeline  
Brochures:  
http://ucfoodsafety.ucdavis.edu/files/287953.pdf | 192  
219 |
| Sanitation and environmental monitoring | Sanitation and environmental monitoring workshop  
Teaching slides, in-person delivery  
https://agsci.oregonstate.edu/wrcefs/resources | N/A<sup>b</sup> |
| Food safety for cottage industry | Food safety education for the cottage industry and farmers market groups  
Survey, videos  
Cross contamination: https://vimeo.com/471232548  
Washing produce: https://vimeo.com/471233230  
Storage and refrigeration:  
https://vimeo.com/471233177  
Cleaning and sanitizing: https://vimeo.com/471233072  
Worker hygiene: https://vimeo.com/471232271 | 11  
10  
4  
11  
7 |
| Commodity-specific food safety plan teaching examples | Teaching example food safety plan for breadfruit flour https://agsci.oregonstate.edu/wrcefs/resources | 3 |
| | A guide to the aquaponics food safety plan development: Green aquaponics LLC as a model  
https://vtechworks.lib.vt.edu/bitstream/handle/10919/88927/FST-302.pdf?sequence=1 | N/A<sup>b</sup> |
| **Focused on produce safety** | | |
| Agricultural water | Improvements to grower tools supporting the agricultural water rule—phone/tablet app  
http://agwater.arizona.edu | 23,514 |
| | Small farm agricultural water monitoring and treatment—multilingual training videos  
https://vimeo.com/471238934 | 15 |
| Repository/database of resources | FSMA produce safety resources  
Database developed, but not yet published  
http://postharvest.ucdavis.edu/FSMA_Produce_Safety_Resources/ | N/A<sup>c</sup> |

<sup>a</sup> Tracking numbers current as of August 2021.

<sup>b</sup> Not available, as views and downloads are not tracked by WRCEFS.

<sup>c</sup> Components of the project completed; however, final version is not yet publicly available.
A resources page on the WRCEFS website has been developed to house the content created by WRCEFS members, including the materials described here. As of August 2021, the resources page has received 849 views, including viewers from eight countries and 81 cities. In addition, the use of resources is tracked through the institutions that developed the materials, with views and/or download numbers (as of August 2021) provided in Table 1.

**DEVELOPED ADD-ON MATERIALS: USES AND IMPACT**

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**SIMPLIFIED PCHF TRAINING FOR SMALL-SCALE PROCESSORS**

Training materials were developed to help small processors gain basic understanding of food safety fundamentals, preventive controls, and requirements under FSMA. Seven modules, delivered in person, included: (1) introduction to FSMA; (2) food safety basics; (3) overview of PCHF; (4) PCHF exemptions; (5) current good manufacturing practices; (6) cleaning and sanitation; and (7) developing FSPs.

**GUIDELINES FOR PISTACHIO PROCESS VALIDATION**

The developed document describes the use of *Enterococcus faecium* NRRL B-2354 in validating thermal processes for pistachios, including how to prepare inoculum and how to store and transport the inoculated pistachio samples. It is based on research conducted at the University of California-Davis and Michigan State University.
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**VALUE-ADDED ON-FARM PROCESSING IN CALIFORNIA**

One flow chart and two timelines were developed to help users determine which state and federal regulations apply to their particular value-added product, clarify information needed to obtain a Processed Food Registration in California, and provide guidance to food processors interested in producing acidified canned foods or low-acid canned foods in California.

**SANITATION AND ENVIRONMENTAL MONITORING WORKSHOP**

Training materials were developed for a workshop on cleaning and sanitation in food handling, processing, and manufacturing facilities, including topics on: (1) hazards and strategies to control them; (2) environmental monitoring; and (3) sanitation in the processing facilities (i.e., sanitary equipment and facility design, cleaners and sanitizers, strategies for pest control, and allergen control strategies).

**COMMODITY-SPECIFIC FOOD SAFETY PLAN TEACHING EXAMPLES**

**Breadfruit Flour**

A model FSP for breadfruit flour provides information on the principles of the risk-based preventive controls that should be utilized during the production of breadfruit flour.

**Guidance and FSP for Aquaponics Producers**

Educational materials were developed for aquaponic producers to help them improve their food safety plans, monitoring, and recordkeeping systems.

**IMPROVEMENTS AND TRANSLATION OF GROWER TOOLS SUPPORTING THE AGRICULTURAL WATER RULE**

This project helped improve the functionality of tools (e.g., Ag Water calculators) developed by the Western Center for Food Safety and the University of Arizona to assist growers in determining if water meets the standards for unrestricted application to produce before harvest. This project also supported translating these tools to Spanish.

**SUMMARY**

In the Western region, significant progress has been made towards FSMA outreach through the establishment of a cadre of trainers to educate growers and processors based on the PSA and FSPCA curricula, respectively. The resources described here were created to assist Extension educators in training produce growers and food processing stakeholders on food safety and FSMA. These resources can be used directly to supplement food safety trainings, or they can be modified to fit the requirements of other regions or specific target audiences.

**REFERENCES**


Western Regional Center to Enhance Food Safety. (2015). *Western Regional Center to Enhance Food Safety*. Oregon State University. https://agsci.oregonstate.edu/wrcefs