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## Cultural Sensitivity: A Requirement When Developing Food Safety Interventions

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## Cultural Sensitivity: A Requirement When Developing Food Safety Interventions

### Cover Page Footnote

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## Cultural Sensitivity: A Requirement When Developing Food Safety Interventions

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**Abstract.** Extension materials that are sensitive to changing demographics and culture increase relevance and compliance with food safety practices. Produce safety extension materials were developed for U.S. Virgin Islands (USVI) produce growers to help with compliance with a new food safety rule. We developed employee training materials based on a needs assessment and behavioral change was evaluated six months after dissemination. The original materials were not seen as culturally appropriate but after modifications, improvements in food safety practices and behavior changes were observed. These results suggest that extension educators should seek feedback from target populations about potential interventions before implementation.

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### INTRODUCTION

The farm setting has been shown to be a major source of contamination to produce (Laidler et al., 2013; Bottichio et al., 2019), indicating a need for strategies to minimize contamination during farm-based operations. The Food Safety Modernization Act (FSMA) Produce Safety Rule (PSR) (U.S. Food and Drug Administration, 2019) establishes mandatory, science-based, minimum standards for the safe growing, harvesting, packing, and holding of fruits and vegetables grown for human consumption. Extension educators are the main source of education to produce farmers in the United States.

When working with culturally diverse populations, Extension educators must use effective communication methods. When designing effective extension programs, Balis et al. (2019) advise that one should consider people in the most need by using multiple delivery methods, developing culturally appropriate interventions, and covering diverse literacy levels. The principle of cultural appropriateness of interventions has been employed in health and nutrition programs with impressive results. Two examples include, *Latinos Living Well*, a culturally designed education program that successfully met the needs of Latinos living with diabetes (Keane & Francis, 2018) and *Families First: Nutrition Education and Wellness System*, a program that improved participants' knowledge of food preparation practices (Jones et al., 2006). Research also has shown that use of culturally appropriate visuals with minimal text and using learners' native languages can be effective at changing food safety behavior (Rajagopal, 2012; Li, 2015; Olsen, 2012). Schiffman (1995) also emphasizes that learners must be able to relate with the illustrations used in printed educational materials. Extension educators can increase the cultural appropriateness of their materials by obtaining feedback about drafts of printed materials from members of the target population and by modifying materials accordingly.

The U.S. Virgin Islands population is diverse in race, socioeconomic status, and language, with residents speaking English, Creole, and Spanish (*Virgin Islands Demographics*, 2017). This diversity must be incorporated into extension programming on the island to ensure compliance with requirements of the FSMA PSR. Our aim of this study was to determine if development of food safety extension materials for USVI produce handlers would change behaviors.

## MATERIALS AND METHODS

Following a needs assessment based on the FSMA PSR to USVI produce growers, we developed training materials including flip charts, posters, and brochures based on U.S. mainland food safety curriculum. Produce farmers in USVI ( $n = 26$ ) evaluated the training materials for quality and content in two rounds using the survey tool by Rice & Valdivia (1991). The original materials were evaluated in round one. Based on the recommendations, the materials were revised and evaluated again in round two. The survey tool evaluated nine criteria using a 5-point Likert scale (1 = *criteria not met at all*, 5 = *criteria totally met*). It included questions about cultural sensitivity and a blank section for comments. The scale used to interpret scores was: total points 40–45 = *use without revision*, 21–39 = *revise*, 0–20 = *reject* (Rice & Valdivia, 1991). We disseminated the modified brochure and posters (Appendix A, Appendix B, Appendix C, and Appendix D) to 18 growers to educate employees on their farms.

Six months after dissemination of the revised materials, we distributed an online and printed survey to assess the impact of education materials on practices.

## RESULTS AND DISCUSSION

Education materials received a mean of total scores of  $43.6 \pm 1.9$  and  $42.4 \pm 3.2$  out of 45 points in the first and second evaluation respectively (Table 1), indicating no need for revision (Rice & Valdivia, 1991), and no significant difference ( $p = .238$ ) in quality.

Although both sets of materials were deemed appropriate for use, cultural appropriateness of the educational materials was the main concern raised by the USVI growers through the comment section. Creators of the initial version of the food safety extension materials based them on a produce grower curriculum that is utilized throughout the mainland US. Although we modified the food extension materials to fit the USVI growing conditions, the pictures and examples were still seen as problematic. From the first evaluation, respondents suggested that photographs of fields in the mainland US be replaced with photographs of fields in USVI and that we include more people of color in illustrations. Growers' written comments included "need photos of local farms, photos of cistern

**Table 1.** Mean Evaluation Score for Specific Criteria, for the Original Materials (Evaluation 1) and Revised Materials (Evaluation 2) Shared with Produce Growers in the U.S. Virgin Islands

Questions about specific criteria	Evaluation 1 $M \pm SD$ ( $n = 8$ )	Evaluation 2 $M \pm SD$ ( $n = 18$ )
Do materials fully present specific themes?	$4.88 \pm .35$	$4.61 \pm .5$
Is the content or message easily understood?	$4.63 \pm .52$	$4.78 \pm .43$
Do the illustrations clarify or complement the written parts?	$5.00 \pm .00$	$4.72 \pm .57$
Is the size of letters easy to read?	$5.00 \pm .00$	$4.83 \pm .38$
Do materials provide a synopsis of the message or content?	$5.00 \pm .00$	$4.72 \pm .46$
Do materials have aspects that emphasize important ideas, such as type, size, style, or color of certain parts?	$4.75 \pm .46$	$4.39 \pm .78$
Are the writing style, grammar, and punctuation appropriate for the audience?	$4.88 \pm .35$	$4.78 \pm .43$
Do materials avoid information overload or too much writing in one place?	$4.75 \pm .46$	$4.67 \pm .69$
Do materials use language easily understood by the target audience?	$4.75 \pm .46$	$4.89 \pm .32$
<b>Mean of total scores:</b>	<b><math>43.6 \pm 1.9^a</math></b>	<b><math>42.4 \pm 3.22^a</math></b>

Note: Mean of total scores with the same superscript are not significantly different ( $p > .05$ ).

## Cultural Sensitivity: A Requirement When Developing Food Safety Interventions



**Figure 1.** This photograph of a vegetable field in Iowa (left) was included in materials for the first evaluation and was replaced by the photograph of a vegetable garden in the U.S. Virgin Islands (right) in modified materials.

**Table 2.** Percentage of Survey Participants' Responses to Questions about Cultural Appropriateness of Original Materials (Evaluation 1) and Revised Materials (Evaluation 2)

Question	Evaluation 1 (n = 8)		Evaluation 2 (n = 18)	
	Yes (%)	No (%)	Yes (%)	No (%)
Do materials meet the educational level, cultural, geographic, and socio-economic characteristics of the target population?	87.5	0	88.9	11.1
Has care been given to ensure that materials do not offend community traditions?	87.5	0	94.4	5.6
Do materials represent everyday situations?	62.5	25	94.4	5.6
Would you use the education materials as they are?	75	12.5	100	0
Do materials need revision or improvement before being used?	37.5	62.5	11.1	88.9

on the farms, more local animals, goat, sheep, and chicken.” “It needs to be Caribbean centric. More black hands, places of St. Thomas, St. Croix, & St. John to show our farmers what to do here. It’s a great start soil, environment, and water. Very much needed great job.” This request is confirmed by Schiffman’s (1995) recommendation that target populations should relate with illustrations used in printed education materials (Figure 1). As result of these suggestions, we worked with USVI Cooperative Extension to gather and capture pictures and examples that were USVI-centric and reflected the people, demographics, and culture of the farm environment.

After modification, more participants found the educational materials were culturally appropriate, met their education levels, did not offend community traditions, and represented everyday situations (Table 2).

Six months after the distribution of the modified materials, produce growers were surveyed regarding the impact of the materials on employee behavior. Eleven produce growers responded to the 6-month follow up survey. All produce growers deemed the re-designed extension materials culturally appropriate and reported that the materials increased their knowledge and awareness about food safety on their farms. Managers observed their employees change personal hygiene practices, cleaning thoroughness, and the ways that water and soil amendments were used on the farm. Our results are supported by Rajagopal (2012), Li (2015), and Olsen (2012) who

found that food workers' practices improved after using culturally appropriate training materials, and by Strohbahn, et al.'s (2018) recommendation to seek input from target populations.

As Extension educators, it is common practice to re-tool educational materials to fit a specific community or project need. Extension educators should pay special attention to pictures and examples provided in standardized materials and consider the cultural differences of target populations when designing interventions for culturally diverse communities. By seeking the opinions of the target populations, the intervention may be more effective at promoting knowledge and behavioral changes.

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**APPENDIX A. FRONT PAGE OF BROCHURE ON REDUCING  
FOOD SAFETY RISKS ON PRODUCE FARMS**



## Reducing Food Safety Risks at Produce Farms

Fresh fruits and vegetables contribute greatly to foodborne disease outbreaks, and are often implicated in multistate outbreaks. Contamination of produce at the farm has the potential to cause foodborne disease outbreaks and should therefore be prevented. This document points out different ways to minimize contamination of fresh produce on the farm.

### AGRICULTURAL WATER

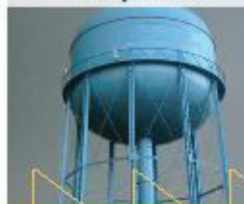
Agricultural water is water intended to contact covered produce, or perform covered activities in which water contacts food contact surfaces, before or after harvest. Water is used in many farm activities like irrigation, cleaning produce, mixing farm chemicals, and cleaning food contact surfaces. If water is contaminated, pathogens will be transferred to produce during these activities.

Water sources on the farm are broadly categorized into municipal water, ground water, and surface water, all with different risks of contamination.

Surface water sources can easily become contaminated by animal feces and runoff during rain events. With the help of a laboratory, sample and test all water sources on the farm for microbial quality.

- Pre-harvest water must contain less than 126 CFU/100mL.
- Postharvest water must contain 0 CFU/100mL.
- Restrict animal access to water sources.

municipal water



ground water



surface water



LOW RISK

HIGH RISK

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University of the Virgin Islands

FS0034 February 2020

## APPENDIX B. POSTER ON HARVEST AND POSTHARVEST HANDLING

### Reducing Food Safety Risks at Produce Farms HARVEST AND POST HARVEST HANDLING



Harvesting is a key activity along the produce chain, and the risks of contamination are higher due to more handling involved.



- Store harvesting and packing containers off the floor and away from chemicals.
- Wooden boxes or bins must be cleaned and lined with plastic bags when harvesting.
- Train workers not to harvest produce contaminated with feces, or produce that has been dropped during harvest.
- Use clean tools, equipment, and harvest containers to harvest, and clean and sanitize them after.
- Employees must wash hands before harvesting.





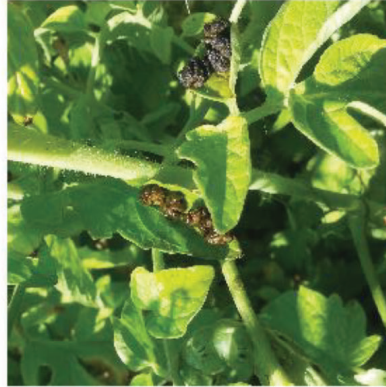
APPENDIX C. POSTER ON BIOLOGICAL SOIL AMENDMENTS OF ANIMAL ORIGIN

**Reducing Food Safety Risks at Produce Farms**  
**BIOLOGICAL SOIL AMENDMENTS OF ANIMAL ORIGIN (BSAAO)**



Soil amendments are materials added to the soil to improve its condition and promote plant growth. Biological soil amendments of animal origin that contain untreated (raw) manure have a high risk of contaminating produce. Examples of BSAAO include compost, kitchen scraps, and manure.

- To minimize the risk of contamination, soil amendments must be treated to destroy pathogens.
- Aerated compost should be treated at 131°F or 55°C for three days followed by curing. Turned composting should be treated at 131°F or 55°C for 15 days followed by curing.
- Use a thermometer to check temperature of the compost pile.



When using and applying soil amendments of animal origin:

- Maximize the time interval between application and harvest.
- Minimize runoff and access by animals.
- Separate raw and finished manure to prevent cross-contamination.
- Designate special tools for treated soil amendments and clean them after use.
- Do not allow manure to contact the edible portion of the plant.

APPENDIX D. POSTER ON CLEANING AND SANITIZING

Reducing Food Safety Risks at Produce Farms

CLEANING AND SANITIZING



Cleaning and sanitizing are important in ensuring safety of fresh produce. Cleaning removes soil and debris from surfaces while sanitizing reduces microbial load from the surfaces.

- All harvesting tools, bins, and postharvest handling tables should be cleaned before and after use.
- Remove debris, trash, and standing water, and cut overgrown grasses inside and outside buildings or in packing shades to avoid pests.

CLEANING STEPS

- When cleaning surfaces remove soil, wash with soapy water, and rinse with clean water.
- When using a sanitizer, make sure it is approved for use on food contact surfaces, and to read the manufacturer's instructions.

