Producer Attitudes Toward the Food Safety Modernization-Act Produce Safety Rule

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Introduction/Need for Research

Many locations in the Southern U.S. are ideal for producing melons and leafy greens. Consumption and demand for melons and leafy greens has increased (Wang & Ryser, 2014). However, production in uncontrollable field environments presents microbiological hazards (Wang & Ryser, 2014). Since 2013, the Centers for Disease Control and Prevention has linked 46% of foodborne illnesses to fresh produce (Painter et al., 2013). Antimicrobial interventions for on-farm use have not been available, with scientific backing. Knowledge and implementation of food safety practices must increase with consumption. In 2011, the Food and Drug Administration began mandating the Food Safety Modernization Act (FSMA) to establish science-based preventive guidelines throughout production to ensure safe and wholesome products for human consumption and hold producers financially accountable for microbial contamination. The primary goal of this study was to develop an instrument to assess adoption of the new Food Safety Modernization Act Produce Safety Rule (FSMAPSR). The instrument was developed to identify the affective, cognitive, and behavioral components of attitude by determining if intention to participate in general online food safety training, early compliance, and on-farm food safety consultants influenced attitudinal constructs. This study aligns with the second research priority of the 2016-2020 American Association for Agricultural Education National Research Agenda that focuses on new technologies, practices, and product adoption decisions (Roberts et al., 2016) because it evaluates growers' adoption of and attitudes toward the FSMAPR.

Conceptual or Theoretical Framework

The Theory of Planned Behavior (TPB) purports that intention to adopt is affected by attitudes toward behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). We focused on the attitudes toward behavior segment of the TPB because subjective norms and perceived behavioral control are less relevant to early compliance of a mandated regulation. Attitudes consist of three intercorrelated components: affective, behavioral, and cognitive (Oskamp & Schultz, 2005). This study was conducted before the enforcement of the FSMAPSR. Thus, the attitudinal components that we included were: (1) self-perceived knowledge of the Produce Safety Rule (PSR), (2) postharvest Food Safety Activities (FSA); (3) self-perceived knowledge of Antimicrobial Field Applications (AFA) for water used during growth, irrigation, fertigation, foliar sprays, or frost production, and (4) perceptions of the FSMAPR which, upon implementation, would hold producers financially accountable for microbial food contamination.

Methodology

A pilot test was conducted using the developed instrument. The study population was cantaloupe and/or leafy green producers. Screening questions included: (1) I grow, harvest, pack, or hold produce, (2) Annually, my farm produces $25,000 or more in produce sales, and (3) My farm grows melons and/or leafy greens. The instrument was a structured questionnaire measuring four attitudinal constructs as dependent variables. Three attitudinal constructs were measured using a 7-point Likert-type (L-T) scale ranging from 1 (Strongly Agree) to 7 (Strongly Disagree). PSR was measured with 12 L-T items (a cognitive measure of attitude), FSA was measured with 14 L-T items (a behavioral measure of attitude), and AFA was measured with eight L-T items (a cognitive measure of attitude). The fourth construct, attitudes toward the FSMA produce safety

rule, was measured using 10 bipolar adjectives with a 7-point semantic differential scale (an affective measure of attitude). Respondents were given an example and asked to check along a seven-point scale between bipolar adjectives. All constructs were deemed internally consistent ($r_\alpha > .72$). Additional variables included growers' responses to whether they would like to participate in a general food safety training program, if their farm was in full FSMA compliance, and if they had employed a consultant to aid in food safety compliance. These other variables were dichotomously measured as yes (coded 1) or no (coded 2).

Results/Findings

All respondents attended an in-person grower training course about FSMA compliance at the Texas A&M AgriLife Research and Extension Center in Weslaco, Texas. Only 62% of respondents attended an online training course about general produce safety and 77% of growers perceived their operation in full compliance with the FSMA Produce Safety rule. Half of the growers employed a consultant and 70% of the growers who did, perceived their operation in full FSMAPSR compliance. Upon visual inspection, there were no apparent differences between the attitudinal variables on additional variables. It should be noted that our sample was both nonrandom and very small ($n = 13$).

Conclusions

This research was part of a larger USDA-sponsored study evaluating the efficacy of Ultra-Violet Light and Sulfuric Acid Fertilizer as microbial treatments for Generic *E. coli* and *Salmonella* common in surface water used for irrigation and packing (Englishbey, 2019) and was conducted prior to the implementation of the FSMAPSR. As this was a pre-pandemic study, and most extension training has been placed online, we are uncertain how producers would respond today. Prior to the policy being implemented, we found no evidence that growers in compliance (early adopters) held stronger attitudes towards the FSMAPR than other growers. The instrument developed will be a useful tool in future studies, following policy implementation. Finally, only about half of the producers had employed a consultant to advise them in FSMA compliance. It will be useful to evaluate how the policy has affected demand for consultants and online training tools and their impact on attitudes around the FSMAPSR, post pandemic. The instrument developed could be a critical tool in further evaluating FSMA compliance and the new Produce Safety Rule and the authors plan to share it with AAAE-S participants.

Implications/Recommendations/Impact

Small-scale growers may not have the means to change production practices that require capital investments. Growers who are near retirement age may be resistant to changes in production practices and adoptability of online resources. Growers who contract with larger produce buyers may have nondisclosure clauses prohibiting their participation in this research. Results give guidance to researchers and governmental entities on areas of food safety that should be emphasized when implementing antimicrobial interventions and participation in continuing education for food safety and compliance among growers. This study should be replicated to identify training needs and delivery mechanisms of produce producers in other regions of the country. The instrument developed through this study may be beneficial to others in measuring differences in attitude constructs after the implementation of the Produce Safety Rule on larger sample sizes. Constructs 1-3 in the instrument need further testing for internal consistency and uni-dimensionality. Subsequent research should include the missing components of the TPB (subjective -norms and perceived behavioral control).

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