



State Health Department Directors' Insights into Farmers' Markets Inspection Practices and Resources

ABSTRACT

Farmers' markets have experienced tremendous growth in recent decades. Traditionally, they sold raw fruits and vegetables; however, today's farmers' markets also sell prepared, packaged, ready-to-eat (RTE), and temperature controlled for safety (TCS) foods. Because of their role in monitoring the safety of food, state health department directors were surveyed with regard to types of food sold, regulations pertaining to farmers' market vendors, types of products inspected, vendor infrastructure requirements, and their perceptions of food safety risks associated with farmers' markets. Additionally, directors' feedback regarding common inspection practices and state resource allocation was solicited. Results indicated that state inspection funds are, in general, declining and that state health department directors' concerns related to vendors included unapproved product sources, poor food-handling behaviors, and inadequate employee hygiene. Directors also expressed con-

cerns related to declining inspection resources and market deregulation at the state level.

INTRODUCTION

Throughout history, centralized markets where farmers sell fruits and vegetables have been a key societal element. More recently, these markets have diversified, selling much more than just produce. Today, in addition to raw produce, U.S. farmers' markets also support vendors offering prepared and packaged goods, foods prepared onsite for immediate consumption, non-food crafts, textiles and art work, in addition to other items. Markets are now regarded as a tool for economic improvement, a source of nutritious food, and a place of social interaction. Concurrently, markets have also experienced significant growth, more than 450% over the past two decades (2); clearly the spread of products retailed via farmers' markets is expanding.

When markets retailed only fresh produce, the food safety risks were restricted to those associated with fresh produce; however, with the changing nature of modern markets and the fact that markets now sell hot and cold food prepared on

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site for immediate consumption in addition to raw produce, it can be assumed that the risks have increased proportionately. If the risks have indeed increased, then inspection for food safety becomes more urgent. Inspection for food safety falls under the jurisdiction of a number of governmental bodies. Animal-based products, such as processed meats, typically fall under United States Department of Agriculture (USDA) purview, whereas ready-to-eat foods prepared on- or off-site would be regulated by local health inspection agencies following state and county rules grounded in the U.S. Food and Drug Administration (FDA) model code. These agencies have established missions that take priority. For example, the FDA is responsible for drugs, medical devices, the nation's food supply, cosmetics, tobacco products and even radiation emitting products; in general, the FDA is responsible for public health (13). The USDA is responsible for the economic development of agricultural resources, rural America's infrastructural support, enhancement of food safety throughout the supply chain and conservation of natural resources (26). While food safety is certainly a concern for both of these agencies, clearly they have many responsibilities in addition to those associated with food safety.

Resources for these agencies and their state counterparts are finite. Prioritizing resources for maximum efficacy should be a goal of all public agencies, state or national. Since farmers' markets traditionally represented a low public safety risk, it is quite likely that they were not a public resource priority. However, given the increasing popularity and changing nature of farmers' markets, this may no longer be true. An examination of state practices with regard to farmers' market inspections is therefore warranted.

According to the West Virginia University Extension Service Small Farm Center (28), the trend toward buying local foods is rising, for reasons such as energy and environmental conservation, consumer desire for more nutritious foods and support for local economies. Increasing concern about food safety, food origin and production methods have also played a significant role in the increase of local food purchasing (12). Consequently, farmers' markets across the United States have exploded in popularity and are now considered an integral part of the urban/farm linkage, according to the USDA Agricultural Marketing Service (3). Their rapid growth in recent years is evidenced by an expansion from 1,755 markets in 1994 to 5,274 in 2009 (23) and to 8,476 as of August, 2014 (2). In addition, market opportunities have expanded as the number of winter farmers' markets (those that are held between November and March) increased from 1,225 in 2011 to 1,864 in 2012 (1), some in cold weather states (18). Their rapid growth is not surprising in light of their benefits, including a first point of entry into the marketplace for small and medium-sized farmers, access to locally-produced, healthful food for

consumers, formation of robust local economies and vibrant civic designs for communities (4).

Despite the increased number of U.S. farmers' markets, resources for food safety inspections have not increased commensurate with market growth. Significant differences have been noted in state and federal funding for public health. Budgets decreased in 40 states from 2009 to 2010, with 30 of these states decreasing budgets for two consecutive years and 15 decreasing budgets for three years in a row (22). Additionally, about 17,800 jobs in state and territorial health offices were lost through attrition and layoffs since July 2008 (6). Robert Pestronk, the executive director of the National Association of County and City Health Officials, stated, "Unfortunately, a lack of federal, state, and local budget resources is straining an already fragile public health system." He suggested that there are serious gaps in the ability to respond to health crises (27). This is of concern because demand for local foods results, in part, from consumers' increased apprehension over food safety (12).

Temporary foodservice establishments, such as those found at farmers' markets, are less regulated and have less infrastructure support than permanent restaurants. Farmers' markets are often located in sites with no access to water for handwashing or food preparation and no electricity for refrigeration or hot holding food. Given the outdoor nature of most farmers' markets, food is often exposed to temperature extremes and environmental contaminants, such as insects and dirt (29). Any of these factors could increase the risk of foodborne illness if not adequately addressed. Beyond the infrastructure and environmental factors is an assumption held by market managers, vendors, and consumers that the quality and safety of food sold at farmers' markets is superior to that from conventional markets (11, 24). However, studies have found that vendors can seriously underestimate product risks due to lack of knowledge (29), and that 93.7% of the time farmers' market employees preparing RTE foods for immediate consumption failed to meet state code requirements with regard to handwashing behaviors (7). Other studies have noted similar food safety violations, including lack of handwashing, glove abuse and cross contamination associated with food produced in farmers' markets or similar temporary outdoor venues (8, 19, 25). A lack of food safety knowledge coupled with a failure to follow basic sanitation rules and a belief that the food products sold at markets are inherently safer can lead to an increased food safety risk.

Estimates from the Centers for Disease Control and Prevention (10) indicate that between 1998 and 2011, 3,518 confirmed and 844 suspected illnesses in the U.S. were associated with outdoor food sales venues. For example, *Salmonella* Newport was associated with guacamole products sold at farmers' markets in Iowa, and food samples were implicated in an outbreak caused by *E. coli* O157:H7 at a

farmers' market in Alberta, Canada (15). Food safety risks extend beyond those foods prepared on-site, as evidenced by the 2011 multistate outbreak of listeriosis linked to cantaloupe (9) or the *E. coli* O157:H7-infected strawberries sold at farmers' markets in Oregon (21). Clearly, food sold in farmers' markets can lead to foodborne illness outbreaks if not handled appropriately.

Unlike most retail food establishments, farmers' markets do not yet have common set of regulations or sufficient inspection standards. Those selling prepared, ready-to-eat foods may be regulated by one agency and those selling whole, unprocessed foods by another. To further complicate the situation, those selling food as Home-based Vendors fall under what are known as "Cottage Laws" and are treated differently from state-to-state based on local regulations. For example, Maine's Department of Agriculture has very specific rules covering Home Manufactured Foods (14), while Indiana law pertaining to "home manufactured foods allowed for sale at farmers' markets" only requires a label with 10 point font stating "This product is home produced and processed and the production area has not been inspected by the state department of health" (16).

Certification and training requirements for outdoor vendors vary across states and even market to market. For example, Indiana law permits non-profit vendors to produce and sell food without any food safety certification (17). In contrast, rules for operating a food stall at a farmers' market in Seattle and King County, Washington, not only require that a food safety certified food worker be present during operation, but also charge scaled permit fees based upon the level of food risk associated with the submitted menu/vendor plans in order to better support market inspection resources (20).

While much of the food available in farmers' markets is likely safe, the lack of specific and consistent farmers' market regulations, coupled with vendor requirements that vary from market to market, presents possible food safety issues. Concurrently, declining inspection and training resources may pose a risk of foodborne illness stemming from market vendors, especially those preparing and serving ready-to-eat food. Consequently, this study examined state requirements with regard to food safety in farmers' markets, with the broad research objectives of (1) quantifying common inspection practices, (2) examining state inspection resources allocated to farmers' markets, and (3) identifying state concerns with regards to the safety of food served/sold in farmers' markets. To achieve these objectives, this study surveyed the directors of U.S. state and territory health departments.

MATERIALS AND METHODS

To capture these data, a survey was developed during the fall of 2013. Survey items were derived from research literature. The instrument was reviewed by three content experts over the course of four drafts. Once the preliminary instrument was completed, it was forwarded to the Indiana

State Department of Health, whose director originally presented the need for a study of this kind and agreed to review the instrument with key personnel as a pilot test. Revisions were made based upon this feedback. The final instrument was approved by the Institutional Review Board of a Midwestern university and hosted on a Qualtrics online survey platform.

Temporary foodservice establishments, where food is prepared and/or served onsite for immediate consumption, are growing in popularity. At the same time, as noted in the literature, they present unique challenges in terms of food safety and therefore a significant potential for risk. Since temporary foodservice establishments generally fall under the purview of the health department, it was decided to focus the study on State Directors, as they have responsibility for providing oversight, guidance and support to the line level inspectors, while also being uniquely positioned to discuss state legislative initiatives. Thus, this study chose State Health Department Directors as line inspector surrogates with an overall understanding of the issues, practices, and resources associated with farmers' market food safety.

The instrument began with a series of demographic type questions (*Attachment A*) that were developed to delineate the states in terms of resources and demands. The next section contained a series of questions related to the general attitudes of respondents in regard to food safety in farmers' markets (*Attachment B*). The final section included questions designed to enable the researchers to better understand the inspection requirements and food safety concerns related to specific types of foods (*Attachment C*). In this section, the first question asked respondents to identify the types of foods that would require a farmers' market vendor to be inspected in their state and by whom. Then, in order to minimize the number of questions a respondent would encounter, a set of branching questions (2–5) was asked for each of the foods the respondent indicated would require inspection by their agency. For example, if the respondent indicated that unprocessed, whole fruits and vegetables, temperature controlled for safety foods, and ready-to-eat foods prepared at least partially on-site all required inspection by his or her agency, then questions 2–5 were asked three times, each time tailored to one of the different types of food identified. An additional question was included in the follow-up and pertained solely to unprocessed, whole fruits and vegetables.

Since this study was not experimental, the following generalized research questions, instead of formal hypotheses, guided analysis:

1. How do state health department directors rate the food safety risks of food prepared and sold at farmers' markets?
2. How do requirements for selling food at farmers' markets differ among states?
3. What state inspection resources are allocated to farmers' markets?

4. What are the infrastructure requirements for farmers' market vendors?
5. What are the perceived obstacles and concerns with regard to farmers' market food safety?

Data analyses were primarily descriptive (mean, standard deviation, and frequency) and inferential. Participant names and emails were derived from the public Directory of State and Local Officials (5) with data collection beginning in December 2013. E-mails were sent to the director of each state's department designated as responsible for retail food establishment inspection. In addition, emails were sent to five U.S. territories and districts (Washington, D.C., Guam, Puerto Rico, American Samoa, and the U.S. Virgin Islands). Reminder emails were sent ten days later to those who had not commenced the survey and then sent again three weeks after the winter holidays.

RESULTS

In total, 55 U.S. State and Territory Health Department Directors were identified and were sent emails, resulting in thirty submitted surveys, for an initial response rate of 55%. Of the thirty surveys, eleven were substantially incomplete and therefore excluded from analysis, resulting in a total analyzable sample of nineteen and a final response rate of 35%. Because of the nature of the survey, response rates for specific questions varied. The first research question pertained to health department directors' perceptions of the food safety risks of food prepared and sold at farmers' markets. When asked their level of agreement on a 7-point Likert-type scale with the statement, "In general, the foods sold at my state's farmers' markets are safe to eat," 47% indicated that they "somewhat agreed," while only 32% agreed, and 21% neither agreed nor disagreed. None of the respondents "strongly agreed" or disagreed.

When asked to rank food types sold at a farmers' market in terms of which posed the greatest potential foodborne illness risk to the public (1 = greatest risk, 6 = least risk), respondents indicated that temperature controlled for safety (TCS), ready-to-eat (RTE), and home manufactured foods were perceived as the primary public health risks associated with food sold at farmers' markets (*Table 1*).

The second research question targeted differences in state requirements for vendors selling food at farmers' markets. The requirements for selling food at farmers' markets differed by state and also by food type (*Table 2*). It is clear from these data that, of the states that responded, most require applications, fees, and permits; however, demonstrating knowledge of food safety (e.g., passing a certification exam) was not a priority.

The third research question asked about inspection resources allocated to farmers' markets. When asked about the level of resources available to keep the foods sold at farmers' markets safe, of the 18 responses, 78% of respondents indicated that the level of resources available was "much less," "less," or "somewhat less" than necessary, and approximately

22% indicated that the level was "just right." No one indicated that they had more resources than necessary.

Respondents indicated that the average number of state-employed persons employed by states with the primary responsibility of inspecting food establishments was 144.95 ($s = 221.13$). However, these numbers were significantly skewed by the response from California, the state with the largest population base and the largest number of restaurants per inspector of those who responded. Therefore, California responses were excluded, adjusting the sample mean and standard deviation ($\bar{x} = 97.44$, $s = 79.86$) to more closely reflect the typical states.

The ratio of all foodservice operations (both permanent and temporary) to be inspected per inspector was calculated for each state and ranged from a minimum of 15.04 to a maximum of 404.6. The average was calculated to be 229.93 ($s = 113.97$) foodservice operations requiring inspection for each inspector. Assuming each location gets a minimum of two inspections per year, a total of 460 inspections were required per inspector. This means that each inspector was required to complete approximately two inspections per day, every day (assuming an average of 250 working days per year) in order to keep current. Given this, and the likelihood that the duties of most inspectors extend beyond simply completing inspections, it is easy to see how the lack of resources, predominantly labor, could strain the ability of states to conduct inspections.

According to respondents, available resources required to inspect all food establishments (permanent and temporary) have declined by an average of 12.12% over the past five years, and available resources required to inspect farmers' markets have declined 2.46%. Concurrently, the total number of farmers' markets has increased by an average of 34.64% across the respondents' states. Furthermore, the frequency of farmers' market inspections relative to farmers' market days of operation decreased by 5.75% on average. When asked about the biggest obstacles to implementing new means of better ensuring food safety in farmers' markets, 36% cited a lack of resources, as evidenced by comments such as "resources at all three agencies are lean," "lack of funding and support," and "lack of personnel." Demand, as represented by farmers' markets, has increased while supply of inspection resources has decreased. This inequity illustrates potentially serious gaps in the safety of food supplies, especially those foods that are temperature controlled for safety (TCS), ready-to-eat (RTE) and home manufactured.

The fourth research question requested information about infrastructure requirements of farmers' market stalls where food is sold. Infrastructure requirements varied dramatically by both the state where the farmers' market was located and the food type being sold by the farmers' market vendor (*Table 3*). The minimal electrical requirement findings are interesting, as refrigeration is one of the best means of ensuring consistent temperature

TABLE 1. Director's assessment of risk by food type

Type of Food	^a Ranking
Temperature controlled for safety (TCS) foods ($\bar{x} = 2.06, s = 1.24$)	1
Ready-to-eat (RTE) foods prepared at least partially on-site ($\bar{x} = 2.25, s = 1.24$)	2
Home manufactured foods / home-based vendors ($\bar{x} = 3.06, s = 1.18$)	3
Processed, NOT temperature controlled for safety (TCS) ($\bar{x} = 3.69, s = .87$)	4
Unprocessed, whole fruits and vegetables fifth ($\bar{x} = 4.31, s = 1.62$)	5
^b Other (shell eggs, apple cider, low acid/acidified foods) ($\bar{x} = 5.63, s = 1.09$)	6

^a1 = Greatest risk, 6 = least risk^bOpen-ended question**TABLE 2. Requirements for selling food at farmers' markets**

Type of Food	State Requirements	% ^a (n)
Processed, NOT temperature controlled for safety (i.e., baked goods, pickles)	Food safety permit required	100
	Vendor must complete application, pay health department inspection fee, and review a prepared statement about food safety	67
	Proof of completion of a food safety course required	33
		(n = 3)
Temperature controlled for safety (TCS) (i.e., meats, poultry, dairy)	Vendor must complete application	100
	Vendor must pay health department inspection fee	75
	Proof of completion of a food safety course required, must demonstrate knowledge of food safety, and obtain a food safety related permit	38
	Vendors must obtain a temporary food stand permit	13
		(n = 8)
Ready-to-eat (RTE) foods prepared at least partially on-site (burgers, hot dogs, salads)	Vendor must complete application	100
	Vendor must pay health department inspection fee	64
	Vendor must obtain a food safety related permit	55
	Must demonstrate knowledge of food safety	36
	Proof of completion of a food safety course required	27
		(n = 11)

^aResponse rates vary based upon respondent's selections (see Attachment C, question 1)

control. The implication is that food requiring cold holding is being temperature controlled through the use of passive methods, such as ice coolers and frozen gel packs. While these can be effective when properly used, if inspection

resources and vendor training requirements are limited, gaps in food safety may occur.

The fifth research question sought open-ended responses to concerns related to the safety of food sold at farmers'

TABLE 3. Vendor stall infrastructure requirements based upon type of food sold

Type of Food	Stall Requirements	% ^a (n)
Processed, NOT temperature controlled for safety (i.e., baked goods, pickles)	Overhead protection	100
	Potable water in stall	100
	Handwashing station in market or in/near vendor's stall	67
	Side protection	33
	Sanitizing agent in stall	33
		(n = 3)
Temperature controlled for safety (TCS) (i.e., meats, poultry, dairy)	Potable water in stall	100
	Sanitizing agent in stall	100
	Handwashing station in market or in/near vendor's stall	75
	Overhead protection	75
	Side protection	38
	Electricity	13
Ready-to-eat (RTE) foods prepared at least partially on-site (burgers, hot dogs, salads)	Potable water in stall	100
	Sanitizing agent in stall	91
	Handwashing station in market or in/near vendors stall	82
	Overhead protection	73
	Side protection	27
	Electricity	18
		(n = 11)

^aResponse rates vary based upon respondent's selections (see Attachment C, question 1)

markets. Survey respondents, on a 7-point Likert type scale, indicated that on average they somewhat agreed ($\bar{x} = 5.11$, $s = .74$) with the statement, "In general, the foods sold at my state's farmers' markets are safe to eat." Of least concern to directors was the sale of unprocessed (whole) fruits and/or vegetables. As seen in *Table 4*, respondents expressed concerns about the safety of food sold at farmers' markets; specifically, product sourcing, food handling, employee hygiene, market deregulation and declining inspection resources were reoccurring themes found in directors' responses. In terms of practices taken to ensure food safety, common response themes focused on training and providing information, requiring permits, and routine inspections. Respondents also expressed themes focusing on training/education and staffing/regulation in terms of activities they would like to do in the future to ensure the safety of food sold at farmers' markets.

DISCUSSION

This study attempted to quantify common inspection practices with regard to farmers' markets as well as gain an

understanding of inspection resources allocated to farmers' markets and identify concerns related to the safety of food served and sold in farmers' markets. The results of this study identified temperature controlled for safety (TCS), ready-to-eat (RTE), and home manufactured foods as the farmers' market foods most likely to be associated with public health risks. Also evident was that most states required farmers' market vendors to complete applications, secure permits, and pay fees commensurate with the level of food risk associated with respective foods. However, demonstration of food safety knowledge by vendor employees through the completion of food safety courses is not generally required. A decline in inspection resources was reported, which is significant in light of the finding of a significant increase in venues requiring inspection; inspectors are falling behind in terms of available resources per market/vendor.

With regard to infrastructure, potable water, overhead protection and sanitizing agents were the most common requirements, followed by handwashing stations either in the stall or in close proximity to the stall. Electricity

TABLE 4. Directors' responses to open-ended questions

Question (# of responses)	Top response themes and examples
What do you find most alarming with regard to the safety of food sold in farmers' markets? (n = 15)	The top concerns were product sourcing, food handling, personal hygiene, and the variety of products sold: "Illegal, un-inspected vendors," "increasing prevalence of home produced or processed foods," "farmers markets are no longer for produce, but for any and all types of foods," "raw milk sales," "bare hand contact with ready-to-eat foods," "handwashing," and "adequate hand-wash facilities."
What concerns do you have, if any, regarding the resources available in your state to ensure food safety in farmers' markets? (n = 11)	Resources available for market inspections and issues related to deregulation or lack of authority were common themes: "Lack of staff and other resources," "I'm concerned that we don't have sufficient numbers of inspectors to cover," "the trend is to deregulate and leave food safety up to the operators to monitor themselves," "basically farmers markets are unregulated in [state name omitted]," and "lack of statutory authority."
Please describe a few of the best things that your agency currently does to ensure food safety at farmers markets. (n = 13)	Training, providing information, requiring permits, and routine inspections were most commonly mentioned: "Include obtaining food safety training," "we provide food safety training to the market managers on an annual basis," "we provide guidance documents on safe food safety practices on-line and hard copies," "permit all temporary food stands (selling sandwiches, most prepared ready-to-eat foods)," "require vendors to obtain a permit if the product is one which we regulate," "routine inspection and training" and "random spot checks."
Please describe a few things that you would like to see your agency do to better ensure food safety at farmers' markets. (n = 12)	Top response themes concentrated on training/education and staffing/regulation: "More training and education to vendors and market masters," "market manager training, training staff on new home based businesses and making sure they are not focusing on exempt products," "I would like to see us have staff devoted to farmers' markets and other temporary events and be able to enforce current regulations without the fear of retaliation by legislators" and "disallow all prepared foods, allow only fresh fruits and vegetables."
What do you see are the biggest obstacle(s) to implementing those things that you would like to see your agency do to better ensure food safety at farmers' markets? (n = 14)	Most comments pertained to statutory regulation and lack of resources: "The push within the legislature to exempt 'cottage' foods," "conservative philosophy regarding regulations, meaning the state wants economic development for agriculture, but little or no regulatory oversight," "resources at all three agencies are lean" and "lack of funding and support."

was the least required infrastructure element. These infrastructure elements represent minimal food safety measures. Lastly, in terms of directors' insights, unapproved product sources, poor food handling behaviors, inadequate employee hygiene, declining inspection resources and market deregulation were common themes found in the responses. Proactively, directors' indicated that health departments currently focus on vendor training, providing food safety information, requiring permits, and routine inspections, activities that they wish to continue and expand in the future.

Many of these themes are connected. Potable water for cooking and cleaning is a requirement that can be negated by poor food handling behaviors. Sanitizing agents are intended as a measure to prevent cross-contamination;

however, poor food handling behaviors and inadequate personal hygiene contribute to cross-contamination. Declining inspection resources coupled with market deregulation implies that vendors are being held to the honor system, and it is assumed that they are taking all appropriate measures to ensure safe food. However, if vendors and employees are not being required to demonstrate food safety knowledge, then the measures they take may not be informed or adequate.

The identified concerns denote a growing gap in terms of supply (declining inspector resources) and demand (increasing market venues and sales), increasing the possibility of consumers contracting foodborne illnesses. From an economic standpoint, a foodborne illness outbreak could have a devastating impact on both the vendor and the

market, not to mention the consumer. The publicity from a foodborne illness outbreak could result in bankruptcy for the vendor and potentially high insurance claims for the market, as well as a black eye for the host community. The more this gap grows, the greater the risk becomes, as well as the likelihood of foodborne illness.

What to do? State legislatures can increase oversight and correspondingly increase inspection resources. Alternatively, inspection resources may need to become more efficient in order to handle the increasing inspection load. Another possibility is that market managers, vendors and employees could become more attentive, which requires that they receive the training necessary for vigilance. Still another option is that customers can accept the increased level of risk associated with sourcing food from farmers' markets. However, each option comes with an associated cost. Increasing inspection resources means increasing funding. Increasing vendor and employee training would likely result in an increased fee. Accepting an increased level of risk comes with the probability that customers will incur expenses related to getting sick. Perhaps the best alternative is a combination of all choices — provide additional resources for targeted inspections, develop low-cost means of training vendors and employees in fundamental food safety behaviors appropriate to farmers' markets, and establish means of communicating food safety basics to consumers at the point of purchase. The combination of these options could contribute to reducing the foodborne illness risk, while preserving and encouraging the sustainability of farmers' markets.

There were several limitations associated with this study. The first was the sample size. The survey intentionally targeted 55 State and Territory Health Department Directors. The response rate of 35% was deemed adequate; however, in terms of real numbers the data were derived from the responses of 19 directors. While suggestive, this does limit the generalization of the results. The broad nature of this study and use of branching methods may have made the survey too long, subsequently discouraging completion, which would explain the incomplete or unusable surveys. Future research should keep these factors in mind and consider targeting surveys more specifically. Also, over the course of this study it became evident that, in many states, farmers' markets were often under the purview of more than one regulatory agency depending on the types of foods they sold. Therefore, expanding the study to include directors of State Agriculture Departments is warranted, given that each state can distribute inspection and enforcement responsibilities differently. Given the directors' concerns and emphases, future studies should focus on temperature controlled for safety (TCS), ready-to-eat (RTE), and home manufactured foods as a way to reduce and focus surveys. Furthermore, future studies should consider adding a qualitative component in order to add depth and richness to responses. Finally, this study used State Health Department Directors as surrogates for front line inspectors; therefore, the findings of this study may differ from the real-world context experienced by health and other responsible state agencies. A similar survey of front line inspectors and the frequency of inspection could provide valuable information.

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Microbial Challenge Testing for Foods Workshop

May 24–25, 2016

**Embassy Suites Hotel O'Hare-Rosemont
Chicago, IL**

Registration is limited.

More information at www.foodprotection.org

ATTACHMENT A: SURVEY INSTRUMENT

Demographic Questions

1. Which state do you work in? _____
2. Approximately how many persons are employed by your agency and its affiliates (state and local levels) whose primary responsibility it is to inspect food establishments (i.e., restaurants, grocery stores, farmers' markets, food manufacturing facilities, etc.)? _____
3. Approximately how many food establishments (may include: restaurants, grocery stores, farmers' markets, temporary food service establishments, food manufacturing facilities, etc.) is your agency, and its affiliates, responsible for inspecting in your state? _____
4. Please indicate the percentage of these establishments that are temporary in nature. _____
5. Approximately how many farmers' markets (total and per season) are in operation in your state?
Total _____ "Summer" (approx. May – Oct.)
All year _____ "Winter" (approx. Nov. – Apr.)
6. Approximately how many vendors that require inspection are located in these farmers' markets? _____
7. Please indicate on a scale of 1 to 7 your answer to the following statement. The resources that are available in my state to ensure that the foods sold at farmers' markets are safe for the public are:
(1=Much less than necessary to 7=Much more than necessary) _____
8. Please complete the following sentence by indicating the approximate percentage change that has occurred in each of the following items over the last 5 years. In my state...
 - the resources required to inspect all food establishments has changed by ____ % in the last 5 years.
 - the resources required to inspect farmers' markets has changed by ____ % in the last 5 years.
 - the total number of farmers' markets has changed by ____ % in the last 5 years.
 - the frequency of farmers' market inspections relative to farmers' market days of operation has changed by ____ % in the last 5 years.

ATTACHMENT B: SURVEY INSTRUMENT

Attitudinal Questions

1. Please indicate your level of agreement with the following statement. In general, the foods sold at my state's farmers' markets are safe to eat. (1=Strongly disagree, 7=Strongly agree)
2. Please rank the following food types sold at a farmers' market in terms of which poses the greatest potential foodborne illness risk to the public. (1 = Greatest risk 6 = Least risk) Note: If "Other" is left blank please leave it in the 6th position (i.e., least risk).

<input type="checkbox"/> Unprocessed, whole fruits and vegetables	<input type="checkbox"/> Home Manufactured Foods / Home Based Vendors (i.e., cottage foods)
<input type="checkbox"/> Processed, NOT temperature controlled for safety (TCS) foods (baked goods, pickles, jams & jellies, syrups, honey, etc.)	<input type="checkbox"/> Ready-to-eat (RTE) foods prepared at least partially on-site (sandwiches, salads, entrees, etc.).
<input type="checkbox"/> Potentially hazardous, temperature controlled for safety (PHTCS) foods (meats, poultry, seafood, dairy, processed vegetables, etc.)	<input type="checkbox"/> Other (please specify): _____
3. Please indicate which of the following items a potential farmers' market manager is required to do in your state. Please check all that apply.

<input type="checkbox"/> Complete an application	<input type="checkbox"/> Pay a fee(s) (please specify): _____
<input type="checkbox"/> Review a prepared statement or information packet about food safety	<input type="checkbox"/> Demonstrate knowledge of food safety by answering a short set of questions
<input type="checkbox"/> Provide proof of completion of a food safety course (ServSafe, Prometric, etc.)	<input type="checkbox"/> Obtain a permit(s) (please specify): _____
<input type="checkbox"/> Other (please specify): _____	<input type="checkbox"/> Nothing required
4. What are you the least concerned about with regard to the safety of the food sold in farmers' markets? _____
5. What do you find most alarming with regard to the safety of food sold in farmers' markets? _____
6. What concerns do you have, if any, regarding the resources available in your state to ensure food safety in farmers' markets? _____
7. Please describe a few of the best things that your agency currently does to ensure food safety at farmers' markets (e.g., farmers' market vendor food safety training, market manager food safety training, public awareness campaigns, etc.). _____

8. Please describe a few things that you would like to see your agency do to better ensure food safety at farmers' markets (e.g., farmers' market vendor food safety training, market manager food safety training, public awareness campaigns, etc.). _____
9. What do you see are the biggest obstacle(s) to implementing those things that you would like to see your agency do to better ensure food safety at farmers' markets? _____

ATTACHMENT C: SURVEY INSTRUMENT

Inspection Requirements and Food Safety Concern Questions

1. Please indicate which of the following foods would require a farmers' market vendor to be inspected at the market in your state, and by whom. If the food is required to be inspected by another agency, please specify which agency.

Unprocessed, whole fruits and vegetables No Yes, by my agency Yes, but by: _____

Processed, NOT temperature controlled for safety (TCS) foods No Yes, by my agency Yes, but by: _____

Temperature controlled for safety (TCS) foods No Yes, by my agency Yes, but by: _____

Ready-to-eat (RTE) foods prepared at least partially on-site No Yes, by my agency Yes, but by: _____

Other (please specify): No Yes, by my agency Yes, but by: _____

2. Please indicate which of the following a potential farmers' market VENDOR must do in order to sell <Food type noted in question 1> at farmers' markets in your state. Select all that apply.

Complete an application Pay a health department inspection fee
 Review a prepared statement or information packet about food safety Demonstrate knowledge of food safety by answering a short set of questions
 Provide proof of completion of a food safety course (e.g., ServSafe, Prometric, etc.) Obtain a food safety related permit(s)
 Other (please specify): _____ Nothing required

3. Please indicate on a scale of 1 to 7 (1 = No food safety risk to 7 = Extreme food safety risk) the degree you perceive the following as being a food safety risk with regards to <Food type noted in question 1> sold at farmers' markets.

____ Employee food safety training ____ Inadequate refrigeration
____ Inadequate hot holding ____ Contamination from improper storage, preparation, display, or service.
____ Contamination from the source (the farm, production facility, etc.) ____ Environmental contaminants such as dust, insects, etc.
____ Contamination from pets or other animals

4. Which of the following are required by your agency and its affiliates for farmers' market vendors selling <Food type noted in question 1>? Select all that apply.

Handwashing station (in or near the vendor stall) Handwashing station in the market itself (not necessarily in the vendor's stall)
 Sanitizing agent (bucket w/ solution, wipes, etc.) Overhead protection (tent canopy, solid roof, etc.)
 Side protection (walls) Potable Water
 Electricity Fire Extinguisher
 Other (please specify): _____ Nothing required

5. In your experience, what are the most common violations of your agency's food safety regulations found during inspection of farmers' market vendors selling <Food type noted in question 1>? _____

6. Are you concerned about whether or not farmers' market vendors selling unprocessed, whole fruits and vegetables are following good agricultural practices (GAP)?*

Yes (please explain): _____ No (please explain): _____

*This question was only asked about unprocessed, whole fruits and vegetables.