

Implementation of Food Safety Programs Based on HACCP Principles in School Nutrition Programs



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National Food Service Management Institute The University of Mississippi

Building the Future Through Child Nutrition

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PURPOSE

The purpose of NFSMI is to improve the operation of Child Nutrition Programs through research, education and training, and information dissemination. The Administrative Offices and Divisions of Information Services and Education and Training are located in Oxford. The Division of Applied Research is located at The University of Southern Mississippi in Hattiesburg.

MISSION

The mission of the NFSMI is to provide information and services that promote the continuous improvement of Child Nutrition Programs.

VISION

The vision of the NFSMI is to be the leader in providing education, research, and resources to promote excellence in Child Nutrition Programs.

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IMPLEMENTATION OF FOOD SAFETY PROGRAMS BASED ON HACCP PRINCIPLES IN SCHOOL NUTRITION PROGRAMS

EXECUTIVE SUMMARY

The main purpose of this study was to assess the extent to which school nutrition (SN) programs have implemented food safety programs based on Hazard Analysis and Critical Control Point (HACCP) principles, as required by Section 111 of the Child Nutrition and WIC Reauthorization Act of 2004 (Public Law 108-265). In order to investigate this issue, an online survey was developed by researchers based on the content of the United States Department of Agriculture (USDA) guidance document, *Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles*, and professional literature. SurveyMonkey, a Web-based survey tool, was used to create and administer the survey.

The online survey included six sections. The first section of the survey addressed the status of implementation of food safety programs based on HACCP principles at either the district or school level. The second section of the survey addressed components present in district or school food safety programs. In the third section of the survey, participants provided their perceptions regarding barriers to and practices important in the development and implementation of food safety programs based on HACCP principles. The fourth section of the survey addressed knowledge and skills related to food safety. The fifth section of the survey addressed food safety information, training, and resources. In the sixth and final section of the

survey, participants were asked to provide information about themselves or their districts or schools.

The sample for this study consisted of SN directors and managers participating in SN programs. Survey invitation letters were mailed to a total of 14,682 SN directors, after accounting for letters returned as undeliverable. Each SN director was asked to distribute an additional survey invitation letter to an SN manager in his or her district, resulting in a potential sample size of 29,364. A total of 2,716 participants responded to the online survey, for a response rate of 9.2%. Of the 2,716 respondents, 1,610 (59.3%) were SN directors and 1,106 (40.7%) were SN managers.

Results indicated that although the vast majority of SN directors and managers surveyed reported that their districts and schools, respectively, had implemented food safety programs based on HACCP principles, a more detailed status assessment revealed that the implementation process was often not complete. In addition, the components of the food safety programs in SN programs were assessed. Results indicated that school food safety programs did not include all components required for a program consistent with HACCP principles, as outlined in the USDA guidance document.

Motivations for adopting food safety programs based on HACCP principles also were investigated. The main motivations reported for implementing these programs included meeting state agency requirements and improving the safety of foods served. Finally, characteristics of SN directors or school districts were examined in relation to implementation status of food safety programs based on HACCP principles. Directors who had worked in SN programs for more than 20 years, school districts in the Southwest region, and larger school districts were all more likely to have implemented food safety programs based on HACCP principles.

Barriers and practices related to the implementation of school food safety programs based on HACCP principles were investigated. For both SN directors and managers, the top barriers to the implementation were related to time, costs, and negative perceptions of food safety programs based on HACCP principles. The top factors important in implementing food safety programs based on HACCP principles were related to restricting ill employees from work with food, positive role modeling regarding food safety, ensuring that role expectations are understood, providing necessary training and materials, ensuring that programs are practical to apply, and gaining employee “buy-in” to programs.

Perceived knowledge and skills related to food safety were evaluated. In general, SN directors perceived their food safety-related knowledge and skill as “good,” while SN managers perceived their food safety-related knowledge and skill as “good” to “excellent.” Thus, SN managers perceived themselves as having slightly greater knowledge and skill levels than did SN directors. It is important to emphasize, however, that perceived, rather than actual, knowledge and skill level were assessed in this study.

Sources of food safety information and preferred format for food safety information and training were examined. Sources of food safety information used by a majority of both SN directors and managers included the USDA, state or local health departments, the School Nutrition Association, the National Food Service Management Institute, and ServSafe®. Both SN directors and managers indicated a preference for printed information/materials, followed by in-person training, for receiving personal information or training as well as for providing information or training to employees.

Finally, resources and training needs for the implementation of school food safety programs based on HACCP principles were investigated. Although the participants agreed that

all of the resources assessed were potentially helpful, the main resources utilized by both SN directors and managers included training and/or resources from programs such as ServSafe®, Serving It Safe, and/or Food Handler's programs, the USDA guidance document, and training and/or resources from state agencies.

In conclusion, although SN programs were required by law to implement food safety programs based on HACCP principles by the end of the 2005-2006 school year, many districts and schools still had not completed the implementation process. In addition, although SN directors and managers reported good food safety-related knowledge and skill levels, current school food safety programs did not include all components required for a program consistent with HACCP principles, as outlined in the USDA guidance document. Study results identified barriers and practices related to the implementation of school food safety programs based on HACCP principles, as well as preferred routes for the dissemination of food safety-related information and training identified. These factors will be helpful in achieving greater implementation of food safety programs based on HACCP principles in SN programs.

Recommendations for education and training based on study results include the need for a continued focus on the implementation of food safety programs based on HACCP principles in SN programs, as implementation of these programs was often not complete. Education and training programs and materials could be geared toward those programs with less likelihood of having implemented these programs, such as smaller school districts. One school food safety program component that emerged as lacking in this study was the classification of menu items into process categories and the documentation of this classification. Thus, educational materials and training programs should address this issue, and standardized recipes provided to districts should include classification information.

Study results may also be useful in developing and promoting food safety resources and training programs specifically for use at the local school district level. Barriers to implementation of food safety programs based on HACCP principles and factors supporting implementation identified in this study can be used to promote and support implementation efforts at the local school district level. USDA has an opportunity to partner with state agencies in providing information, training, and follow-up related to the effective implementation of these programs. State agencies should communicate with school district administrators regarding updated food safety regulations, to ensure a commitment to compliance with new guidelines.

There is a need for additional research in several areas. The issue of access to technology and preferred methods for obtaining food safety-related information and training via various technologies needs further study. These issues should be further examined in relation to factors such as school district size and resource availability. Additional data from large school districts is needed, as the respondents in the current study were primarily from small and medium districts. Finally, research examining how state agencies have supported and promoted the implementation of food safety programs based on HACCP principles would be helpful. Agencies which have been successful at promoting implementation of these programs can offer insight and strategies that would be useful in supporting further implementation efforts.

INTRODUCTION

Food safety is a critical component of a healthy school environment. Each day in 2007, more than 30.5 million children received meals through the National School Lunch Program (United States Department of Agriculture [USDA], 2008), and more than 10.1 million children received meals through the School Breakfast Program (USDA, 2008b). Although the meals provided in schools are generally safe, analysis of Centers for Disease Control and Prevention (CDC) data showed that there were 195 outbreaks of foodborne illness, affecting about 12,000 people, reported in schools from 1990 to 1999 (United States General Accounting Office, 2003). The CDC data do not distinguish between illness due to foods from federal school meal programs and illness due to foods from other sources, such as students' homes. However, a follow-up survey of state health officials indicated that of the 59 outbreaks involving 50 or more people, 40 outbreaks, affecting about 5,500 people, could be attributed to school meals. Nineteen of the 40 outbreaks due to school meals resulted from improper food preparation and handling practices within the schools. To improve the safety of school meals, Section 111 of the Child Nutrition and WIC Reauthorization Act of 2004 (Public Law 108-265) required that school food authorities fully implement a food safety program for the preparation and service of school meals based on Hazard Analysis and Critical Control Point (HACCP) principles by the end of the 2005-2006 school year.

HACCP is "a preventative system to reduce the risk of foodborne illness through appropriate food handling, monitoring, and recordkeeping" (National Food Service Management Institute [NFSMI], 2006). HACCP programs include seven principles: 1) identify hazards; 2) identify critical control points; 3) establish critical limits; 4) establish monitoring procedures; 5) establish corrective actions; 6) establish verification procedures; and 7) establish

recordkeeping procedures. The USDA has provided guidance to assist school food authorities in developing food safety programs based on HACCP principles (USDA, 2005). The USDA guidance document, *Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles*, outlines requirements of a school food safety program, lists steps for developing a school food safety program, and provides sample materials, including sample standard operating procedures (SOPs), a sample food safety program, and sample forms for recordkeeping. School food safety programs that conform to the requirements outlined in the USDA guidance document are compliant with HACCP principles.

Although few studies are available documenting the extent of implementation of food safety programs based on HACCP principles in school nutrition (SN) programs, the available research suggests that implementation prior to the new law was limited. Early studies document HACCP implementation rates in schools to be in the range of 14% to 30%. For example, a study by Hwang, Almanza, and Nelson (2001) showed that only 14% of Indiana school foodservice directors and managers had implemented a HACCP program. Similarly, Youn and Sneed (2003) found that only 22% of school foodservice directors surveyed, representing both a national and Iowa sample, reported that they had implemented a comprehensive HACCP plan. Finally, Giampaoli, Sneed, Cluskey, and Koenig (2002) reported that 30% of a national sample of foodservice directors indicated that they had established HACCP programs. The most recent study identified, conducted by the NFSMI, found that 65% of a national sample of foodservice managers reported that their schools had begun implementing HACCP (NFSMI, 2005). No research was identified investigating the extent of HACCP implementation in schools after the 2006 implementation deadline.

Research Objectives

The main purpose of this study was to assess the extent to which SN programs have implemented food safety programs based on HACCP principles, as required by Section 111 of the Child Nutrition and WIC Reauthorization Act of 2004 (Public Law 108-265). Specific issues to be assessed include the following:

- Implementation status of food safety programs based on HACCP principles in SN programs;
- Components included in school food safety programs;
- Barriers and practices related to the implementation of school food safety programs based on HACCP principles;
- Perceived food safety knowledge and skills;
- Sources of food safety information and preferred format for food safety information and training; and
- Resources and training needs for the implementation of school food safety programs based on HACCP principles.

METHODS

Survey Development and Pilot Testing

The survey instrument for this research study was developed by the researchers based on the content of the United States Department of Agriculture (USDA) document, *Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles* and information in professional literature. USDA representatives provided input on survey scope, content, and wording on an ongoing basis during the survey development process. The survey was designed to be administered electronically. SurveyMonkey, a Web-based survey tool, was used to create and administer the survey. The survey contained an initial routing item asking that participants identify themselves as either a school nutrition (SN) director or SN manager based on the title that best describes their professional position. From that item, participants were routed to a version of the survey designed for either directors or managers. These two versions of the survey contained the same six sections, with wording and answer choices modified minimally to be appropriate for either SN directors at the school district level or SN managers at the school level.

The first section of the survey addressed implementation of food safety programs based on Hazard Analysis and Critical Control Point (HACCP) principles at either the district or school level. This section included items assessing the presence of written standard operating procedures (SOPs) for food safety as well as food safety programs based on HACCP principles at the district or school level. Additional items further assessed the development and implementation status of food safety programs based on HACCP principles in the district or school; the academic year when these programs had been implemented (if implementation was complete); and the motivations for developing and implementing these programs.

The second section of the survey addressed components present in district or school food safety programs. First, participants were asked to indicate the perceived level of importance of a set of 14 food safety program components outlined in the USDA guidance document as being consistent with a food safety program based on HACCP principles. The response scale was a 4-point Likert-type scale (4 = *very important*, 1 = *not at all important*). Then, participants indicated if their district or school had implemented each of these components, using a scale of “yes,” “no,” or “in progress.” Next, participants indicated if their district or school had written SOPs for a list of 15 food safety tasks and whether or not documentation or recording of 11 food safety tasks occurred in their district or school, using a “yes” or “no” response.

In the third section of the survey, participants were asked to rate their level of agreement with a set of 28 potential barriers to the development and implementation of food safety programs based on HACCP principles. Next, participants were asked to rate their level of agreement with 24 statements identifying practices important in the development and implementation of food safety programs based on HACCP principles. The response scale for both sets of items was a 4-point Likert-type scale (4 = *strongly agree*, 1 = *strongly disagree*).

The fourth section of the survey addressed knowledge and skills related to food safety. First, general food safety-related knowledge and skills were assessed. These items were common to both SN directors and managers. Next, National Food Service Management Institute (NFSMI) competencies specific to SN directors or managers, including both knowledge and skill statements, were assessed. In each case, degree of knowledge and level of skill were assessed using a 4-point Likert-type response scale (4 = *excellent*, 1 = *poor*).

The fifth section of the survey addressed food safety information, training, and resources. First, participants were asked to indicate sources from which they obtain food safety information.

Next, SN directors and managers were asked if food safety certification was required for managers or employees in their districts or schools, respectively. Participants were then asked to identify the primary source used to provide basic food safety training for managers or employees. The next two items asked SN directors and managers to identify their preferred formats for receiving personal information or training related to food safety and their preferred formats for providing information or training to employees. Finally, participants were asked to rate their level of agreement that a list of 18 resources would be helpful in the development and implementation of food safety programs based on HACCP principles. The response scale was a 4-point Likert-type scale (4 = *strongly agree*, 1 = *strongly disagree*). Then, SN directors and managers indicated which of these same resources their districts or schools had actually utilized in developing and implementing a food safety program based on HACCP principles.

In the sixth and final section of the survey, participants were asked to provide information about themselves or their districts or schools. Items in this section addressed certification or credential status, years of experience, age, sex, education level, USDA region, presence of formal food safety teams in the district or school, frequency of health department inspections, type of food production system, and district or school enrollment.

The online survey was pilot tested by USDA and state agency representatives. Eighteen individuals were asked to participate in the pilot survey process by reviewing the survey invitation letter and pilot survey for either SN directors or SN managers. Those who agreed to participate were e-mailed a letter explaining the pilot survey review process, a copy of the draft survey invitation letter(s), and a survey evaluation form.

Reviewers were asked to review the draft survey invitation letter(s), which included a link to the online survey, and then to complete the pilot version of the online survey. After

completing the survey, they were asked to complete an evaluation form containing nine questions to assess the content, clarity, and navigability of the survey invitation letters and online survey. Additional space was provided on the evaluation form for reviewers to offer additional comments and recommendations for revisions. Reviewers were asked to return completed evaluation forms to the researchers via e-mail.

Eight reviewers returned the pilot survey evaluations. Only minor wording changes were made to the online survey instrument, based on the recommendations provided by pilot study participants.

Sample Recruitment

The sample for this study consisted of SN directors and managers participating in SN programs. A mailing list for all SN directors (N = 14,848) participating in SN programs was purchased from Market Data Retrieval. E-mail addresses were not available, so survey invitation letters were mailed via the postal service to all SN directors. Each SN director was asked to distribute an additional survey invitation letter to an SN manager in his or her district, resulting in a potential sample size of 29,696. One hundred sixty-six survey invitation letters were returned as undeliverable, resulting in a final potential sample size of 29,364.

Survey invitation letters informed participants of the purpose of the study, asked for their participation, assured them of the anonymity of their responses, and provided researchers' contact information for questions or concerns. In addition, survey invitation letters provided instructions for completing the online survey, and included a Web address for accessing the secure online survey, with instructions for typing the Web address into the address field of a Web browser. One week after the survey invitation letters were mailed to SN directors, a reminder postcard was sent. This postcard reminded SN directors to complete the online survey

and also to ask a manager to complete the survey, if they had not already done so. The survey Web address was provided again in the reminder postcard. Participants were asked to complete the online survey within a two-week period; however, the survey remained open in SurveyMonkey for a four-week period.

Informed Consent

Protocol for the study was reviewed and approved by the Institutional Review Board at The University of Southern Mississippi.

Data Analysis

Survey data were analyzed using the statistical package SPSS Version 17.0 for Windows. Descriptive statistics were computed for all variables, including means, standard deviations, and frequencies of total responses, as appropriate. Exploratory principal components factor analysis was performed on barriers to implementing food safety programs based on HACCP principles and factors important in implementing food safety programs based on HACCP principles, to determine if each set of items could be reduced to a smaller number of factors to allow for comparisons in SN directors' and managers' perceptions. These factor analyses did not yield similar factors for SN directors and managers; thus, these data were analyzed using only descriptive statistics. Ratings on perceived general food safety knowledge and skill statements were compared for SN directors and managers using *t*-tests. Pearson chi-square tests were used to determine if selected program and personal characteristics were associated with implementation status of food safety programs based on HACCP principles.

RESULTS AND DISCUSSION

Participants

Survey invitation letters were mailed to a total of 14,682 school nutrition (SN) directors, after accounting for letters returned as undeliverable. Each SN director was asked to distribute an additional survey invitation letter to an SN manager in his or her district, resulting in a potential sample size of 29,364. A total of 2,716 participants responded to the online survey, for a response rate of 9.2%. Of the 2,716 respondents, 1,610 (59.3%) were SN directors and 1,106 (40.7%) were SN managers.

Program and personal characteristics of SN directors are provided in Table 1. The majority of directors were females (88.3%) who were 50 years of age or older (61.0%). The largest percentage of participants had completed some college (22.7%), had worked in SN programs for more than 20 years (28.8%), and had been in their current positions one to five years (31.5%). In terms of certifications and credentials held, a majority of respondents were ServSafe® certified (63.9%). The majority of directors worked in school districts with an enrollment of less than 2,799 (56.1%). Respondents represented all United States Department of Agriculture (USDA) regions, with the largest percentage of participants from the Midwest region (26.5%) and the smallest percentage of participants from the Northeast region (8.8%). A majority of directors reported that there were no formal food safety teams in their districts or schools (79.8%) and that district schools receive two or more health department inspections per year (92.9%). The main type of food production system used in the school districts was a conventional on-site system (88.1%).

Table 1

Program and Personal Characteristics of School Nutrition Directors

Item	Frequency	%
Certifications/Credentials (n = 1,225) ^a		
ServSafe® certified	783	63.9
School Nutrition Association certified	457	37.3
Not certified/credentialed	238	19.4
State Department of Education certified	216	17.6
School Nutrition Specialist	199	16.2
Registered Dietitian	147	12.0
Licensed Dietitian/Nutritionist	70	5.7
Certified Dietary Manager	57	4.7
Dietetic Technician, Registered	16	1.3
Years Worked in School Nutrition Programs (n = 1,265)		
< 1 year	34	2.7
1-5 years	188	14.9
6-10 years	231	18.3
11-15 years	227	17.9
16-20 years	221	17.5
> 20 years	364	28.8
Years in Current Position (n = 1,266)		
< 1 year	85	6.7
1-5 years	399	31.5
6-10 years	341	26.9
11-15 years	190	15.0
16-20 years	123	9.7
> 20 years	128	10.1
Age (n = 1,263)		
< 20 years	0	0
20-29 years	22	1.7
30-39 years	122	9.7
40-49 years	349	27.6
≥ 50 years	770	61.0
Sex (n = 1,249)		
Female	1103	88.3
Male	146	11.7

Note. USDA = United States Department of Agriculture.

^aPercentages for this item total greater than 100%, because participants could select multiple responses.

Table 1 continues

(Table 1 continued)

Program and Personal Characteristics of School Nutrition Directors

Item	Frequency	%
Highest Level of Education Completed (n = 1,267)		
Less than high school diploma	5	0.4
High school diploma or GED	246	19.4
Some college	288	22.7
Associate or two year degree	140	11.0
Bachelor's degree	275	21.7
Some graduate work	92	7.3
Master's degree	201	15.9
Doctorate degree	20	1.6
USDA Region (n = 1,267)		
Midwest	336	26.5
Mountain Plains	207	16.3
Southwest	184	14.5
Southeast	178	14.0
Western	136	10.7
Mid-Atlantic	115	9.1
Northeast	112	8.8
Formal Food Safety Team(s) (n = 1,260)		
No	1006	79.8
Yes, district food safety team	141	11.2
Yes, school food safety team(s)	113	9.0
District Schools Receive ≥ 2 Inspections Per Year (n = 1,260)		
Yes	1170	92.9
No	90	7.1
Type of Food Production Systems in District (n = 1,267) ^a		
Conventional On-Site	1116	88.1
Base Kitchen	323	25.5
Satellite (Receiving) Kitchen	314	24.8
Central Kitchen	178	14.0
District Enrollment (n = 1,267)		
$\leq 2,799$	711	56.1
2,800-29,999	505	39.9
$\geq 30,000$	51	4.0

Note. USDA = United States Department of Agriculture.

^aPercentages for this item total greater than 100%, because participants could select multiple responses.

Program and personal characteristics of SN managers are provided in Table 2.

Characteristics of SN managers were similar to those of SN directors in many cases. The majority of managers were females (96.9%) who were 50 years of age or older (55.7%). The largest percentage of participants had completed a high school diploma or GED (48.6%), had worked in SN programs for more than 20 years (23.2%), and had been in their current positions one to five years (34.4%). In terms of certifications and credentials held, a majority of respondents were ServSafe® certified (65.5%). The largest percentage of managers worked in schools with an enrollment of 300-599 (33.7%), and served an average of less than 300 lunches per day (30.3%). Respondents represented all USDA regions, with the largest percentage of participants from the Midwest region (22.6%) and the smallest percentage of participants from the Mid-Atlantic region (6.1%). A majority of managers reported that there were no formal food safety teams in their district or school (67.3%) and that their schools receive two or more health department inspections per year (94.2%). The main type of food production system used in the schools was a conventional on-site system (80.7%).

Table 2

Program and Personal Characteristics of School Nutrition Managers

Item	Frequency	%
Certifications/Credentials (n = 649) ^a		
ServSafe® certified	425	65.5
School Nutrition Association certified	224	34.5
Not certified/credentialed	150	23.1
State Department of Education certified	65	10.0
Certified Dietary Manager	41	6.3
School Nutrition Specialist	36	5.5
Licensed Dietitian/Nutritionist	10	1.5
Registered Dietitian	8	1.2
Dietetic Technician, Registered	2	0.3
Years Worked in School Nutrition Programs (n = 690)		
< 1 year	12	1.7
1-5 years	97	14.1
6-10 years	151	21.9
11-15 years	151	21.9
16-20 years	119	17.2
> 20 years	160	23.2
Years in Current Position (n = 692)		
< 1 year	39	5.6
1-5 years	238	34.4
6-10 years	165	23.8
11-15 years	142	20.5
16-20 years	54	7.8
> 20 years	54	7.8
Age (n = 690)		
< 20 years	0	0
20-29 years	8	1.2
30-39 years	57	8.3
40-49 years	241	34.9
≥ 50 years	384	55.7
Sex (n = 688)		
Female	667	96.9
Male	21	3.1

Note. USDA = United States Department of Agriculture.

^aPercentages for this item total greater than 100%, because participants could select multiple responses.

Table 2 continues

(Table 2 continued)

Program and Personal Characteristics of School Nutrition Managers

Item	Frequency	%
Highest Level of Education Completed (n = 694)		
Less than high school diploma	15	2.2
High school diploma or GED	337	48.6
Some college	228	32.9
Associate or two year degree	64	9.2
Bachelor's degree	32	4.6
Some graduate work	6	0.9
Master's degree	11	1.6
Doctorate degree	1	0.1
USDA Region (n = 690)		
Midwest	170	24.6
Mountain Plains	156	22.6
Southeast	104	15.1
Southwest	97	14.1
Western	64	9.3
Northeast	57	8.3
Mid-Atlantic	42	6.1
Formal Food Safety Team(s) (n = 675)		
No	454	67.3
Yes, district food safety team	127	18.8
Yes, school food safety team(s)	94	13.9
School Receives ≥ 2 Inspections Per Year (n = 689)		
Yes	649	94.2
No	40	5.8
Type of Food Production Systems in School (n = 693)		
Conventional On-Site	559	80.7
Base Kitchen	76	11.0
Central Kitchen	41	5.9
Satellite (Receiving) Kitchen	17	2.5
School Enrollment (n = 692)		
< 300	136	19.7
300-599	233	33.7
600-899	137	19.8
≥ 900	186	26.9

Note. USDA = United States Department of Agriculture.

^aPercentages for this item total greater than 100%, because participants could select multiple responses.

Table 2 continues

(Table 2 continued)

Program and Personal Characteristics of School Nutrition Managers

Item	Frequency	%
Average Lunches/Day (n = 693)		
< 300	210	30.3
300-399	137	19.8
400-499	73	10.5
500-599	72	10.4
600-699	52	7.5
700-799	36	5.2
800-899	28	4.0
900-999	15	2.2
≥ 1000	70	10.1

Note. USDA = United States Department of Agriculture.

^aPercentages for this item total greater than 100%, because participants could select multiple responses.

Implementation Status of Food Safety Programs Based on HACCP Principles

Table 3 provides information regarding the implementation status of food safety programs based on Hazard Analysis and Critical Control Point (HACCP) principles at the district level, as reported by SN directors. The vast majority of directors reported that all schools in the district had written Standard Operating Procedures (SOPs) for food safety (92.5%). In addition, the vast majority indicated that all schools in the district had implemented food safety programs based on HACCP principles (93.0%). However, a more detailed assessment of the status of food safety programs based on HACCP principles revealed that only 63.5% of districts had completed the implementation process for its schools. An additional 26.2% of districts were still in the process of implementing these programs, while the remaining 10.3% of districts had not begun the implementation process. Those directors who reported that implementation was complete for their districts were asked when the food safety programs based on HACCP principles were implemented. The largest percentage of directors indicated that implementation was completed during the 2005-2006 school year (26.6%), followed closely by the 2006-2007 school year

(26.0%). Directors who reported that their districts had at least begun the process of developing food safety programs based on HACCP principles were asked about their motivations for doing so. The main motivations reported included “requirement of the state agency” (78.9%), “improvement in safety of foods served” (73.2%), “awareness of HACCP as the best approach to food safety” (62.2%), and “awareness of risk/consequences of foodborne illness” (58.1%). Interestingly, only 56.1% reported “requirement of federal law” as a motivation.

Table 3

District Implementation of Food Safety Programs Based on HACCP Principles

Item	Frequency	%
Schools in district with written SOPs for food safety (n = 1,538)		
All schools	1,422	92.5
Some schools	58	3.8
None of the schools	58	3.8
Schools in district that have implemented food safety programs based on HACCP principles (n = 1,542)		
All schools	1,434	93.0
Some schools	59	3.8
None of the schools	40	2.6
Don't know	9	0.6
Status of food safety programs based on HACCP principles in district (n = 1,550)		
Development not begun	36	2.3
In process of developing	84	5.4
Developed but not implemented	40	2.6
In process of implementing	406	26.2
Implementation complete	984	63.5

Note. HACCP = Hazard Analysis and Critical Control Point; SOPs = standard operating procedures.

^aThis item includes only those districts with implementation complete.

^bPercentages for this item total greater than 100%, because participants could select multiple responses.

Table 3 continues

(Table 3 continued)

District Implementation of Food Safety Programs Based on HACCP Principles

Item	Frequency	%
When implemented food safety programs based on HACCP principles (n = 967) ^a		
Prior to 2005-2006 school year	164	17.0
During 2005-2006 school year	257	26.6
During 2006-2007 school year	251	26.0
During 2007-2008 school year	212	21.9
During 2008-2009 school year	79	8.2
During 2009-2010 school year	4	0.4
Motivation for developing food safety program based on HACCP principles (n = 1,480) ^b		
Requirement of state agency	1,167	78.9
Improvement in safety of foods served	1,084	73.2
Awareness of HACCP as the best approach to food safety	920	62.2
Awareness of risk/consequences of foodborne illness	860	58.1
Requirement of federal law	831	56.1
Way to reduce liability	603	40.7
Way to save money	204	13.8
Way to save time	184	12.4
Previous incident of foodborne illness in district	66	4.5

Note. HACCP = Hazard Analysis and Critical Control Point; SOPs = standard operating procedures.

^aThis item includes only those districts with implementation complete.

^bPercentages for this item total greater than 100%, because participants could select multiple responses.

Table 4 provides the same information regarding the implementation status of food safety programs based on HACCP principles at the school level, as reported by SN managers. These data were very similar to the results reported by directors. The vast majority of managers reported that their schools had written SOPs for food safety (94.3%) and that their school had implemented food safety programs based on HACCP principles (92.6%). Again, however, a more detailed assessment of the status of food safety programs based on HACCP principles revealed that only 70.3% of schools had completed the implementation process for its schools. An additional 18.8% of schools were still in the process of implementing these programs, while

the remaining 10.9% of schools had not begun the implementation process. The largest percentage of managers indicated that implementation of food safety programs based on HACCP principles was completed prior to the 2005-2006 school year (25.0%), followed closely by the 2006-2007 school year (24.7%). The main motivations reported by managers for developing and/or implementing food safety programs based on HACCP principles included “improvement in safety of foods served” (74.6%), “requirement of the state agency” (74.1%), “awareness of HACCP as the best approach to food safety” (71.9%), and “awareness of risk/consequences of foodborne illness” (63.0%). Only 45.6% of managers reported “requirement of federal law” as a motivation.

Table 4

School Implementation of Food Safety Programs Based on HACCP Principles

Item	Frequency	%
School has written SOPs for food safety (n = 1,045)		
Yes	985	94.3
No	60	5.7
School has implemented food safety program based on HACCP principles (n = 1,042)		
Yes	965	92.6
No	40	3.8
Don't know	37	3.6
Status of food safety programs based on HACCP principles in school (n = 1,053)		
Development not begun	37	3.5
In process of developing	53	5.0
Developed but not implemented	25	2.4
In process of implementing	198	18.8
Implementation complete	740	70.3

Note. HACCP = Hazard Analysis and Critical Control Point; SOPs = standard operating procedures.

^aThis item includes only those schools with implementation complete.

^bPercentages for this item total greater than 100%, because participants could select multiple responses.

Table 4 continues

(Table 4 continued)

School Implementation of Food Safety Programs Based on HACCP Principles

Item	Frequency	%
When implemented food safety programs based on HACCP principles (n = 724) ^a		
Prior to 2005-2006 school year	181	25.0
During 2005-2006 school year	157	21.7
During 2006-2007 school year	179	24.7
During 2007-2008 school year	142	19.6
During 2008-2009 school year	54	7.5
During 2009-2010 school year	11	1.5
Motivation for developing food safety program based on HACCP principles (n = 790) ^b		
Improvement in safety of foods served	589	74.6
Requirement of state agency	585	74.1
Awareness of HACCP as the best approach to food safety	568	71.9
Awareness of risk/consequences of foodborne illness	498	63.0
Requirement of federal law	360	45.6
Way to reduce liability	327	41.4
Way to save money	165	20.9
Way to save time	157	19.9
Previous incident of foodborne illness in school	51	6.5

Note. HACCP = Hazard Analysis and Critical Control Point; SOPs = standard operating procedures.

^aThis item includes only those schools with implementation complete.

^bPercentages for this item total greater than 100%, because participants could select multiple responses.

Chi-square tests were performed to determine if selected program and personal characteristics of SN directors and/or districts were associated with school district implementation of food safety programs based on HACCP principles. Factors examined included education level, years worked in SN programs, USDA region, and district enrollment. A food safety program based on HACCP principles was considered to have been implemented if the implementation process was reported as complete; otherwise, the district was considered to have not implemented the program. SN directors' education level was not significantly associated with implementation status. Years worked in SN programs was significantly associated with

implementation status ($\chi^2 = 11.8$, $p = .04$), with those directors having worked in SN programs 11-15 years being less likely and those having worked in SN programs more than 20 years being more likely to have implemented food safety programs based on HACCP principles in their districts. In addition, USDA region was also significantly associated with implementation status ($\chi^2 = 16.2$, $p = .01$), with districts in the Northeast region being less likely and districts in the Southwest region being more likely to have implemented food safety programs based on HACCP principles in their schools. Finally, district enrollment was significantly associated with implementation status ($\chi^2 = 16.8$, $p < .001$), with small districts (enrollment $\leq 2,799$) being less likely to have implemented and medium districts (enrollment 2,800-29,999) and large districts (enrollment $\geq 30,000$) being more likely to have implemented food safety programs based on HACCP principles in their schools.

Food Safety Program Components

Participants were provided with a list of 14 food safety program components outlined in the USDA guidance document *Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles* as being consistent with a food safety program based on HACCP principles. They were then asked to rate how important each was in a food safety program using a four-point Likert-type scale (4 = *very important*, 1 = *not at all important*). Table 5 presents the means and standard deviations for SN directors' importance ratings for each of the 14 food safety components in descending order of perceived importance. Table 6 presents the same information for SN managers. Both SN directors and managers perceived each of the 14 food safety program components as important, with mean perceived importance ratings for individual components ranging from 3.0 to 3.7 for directors and from 3.2 to 3.7 for managers.

Table 5

School Nutrition Directors' Perceptions of the Importance of Food Safety Program Components

Statement	n	Mean^a	SD
Monitoring of critical control points and standard operating procedures by making direct observations or taking measurements	1,371	3.7	0.5
Corrective actions to take when control measures are not met	1,369	3.7	0.5
Training for employees on corrective actions to take when control measures are not met	1,375	3.7	0.5
Standard operating procedures (written step-by-step instructions) for foodservice tasks that affect the safety of food	1,378	3.6	0.6
Standard operating procedures that include instructions on monitoring, documentation, corrective actions, and periodic review of the procedures	1,368	3.6	0.6
Written documentation of the results of monitoring	1,373	3.5	0.7
Documentation of corrective actions taken	1,365	3.5	0.6
Ongoing as well as a periodic review of the components of the food safety program consisting of making observations, calibrating equipment/devices, reviewing records/actions, and discussing procedures	1,369	3.5	0.6
Determination of what will be monitored, when and how often monitoring will occur, and who will be responsible for monitoring	1,368	3.4	0.7
Determination of what records will be kept, where to keep them, and who will be responsible for maintaining them	1,370	3.3	0.7
Determination of who is responsible for reviewing the components of the food safety program, when the review will be done, and how it will be documented	1,369	3.3	0.7

Note. SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*very important*) to 1 (*not at all important*).

Table 5 continues

(Table 5 continued)

School Nutrition Directors' Perceptions of the Importance of Food Safety Program Components

Statement	n	Mean^a	SD
Annual review and revision of the food safety program	1,361	3.3	0.7
Classification of all menu items into three process categories (no cook, same day, complex)	1,369	3.1	0.8
Written documentation of the classification of all menu items	1,366	3.0	0.8

Note. SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*very important*) to 1 (*not at all important*).

Table 6

School Nutrition Managers' Perceptions of the Importance of Food Safety Program Components

Statement	n	Mean^a	SD
Standard operating procedures (written step-by-step instructions) for foodservice tasks that affect the safety of food	764	3.7	0.5
Monitoring of critical control points and standard operating procedures by making direct observations or taking measurements	760	3.7	0.6
Corrective actions to take when control measures are not met	753	3.7	0.5
Training for employees on corrective actions to take when control measures are not met	761	3.7	0.5
Standard operating procedures that include instructions on monitoring, documentation, corrective actions, and periodic review of the procedures	757	3.6	0.6
Documentation of corrective actions taken	756	3.6	0.6
Determination of what will be monitored, when and how often monitoring will occur, and who will be responsible for monitoring	760	3.5	0.7
Written documentation of the results of monitoring	762	3.5	0.7
Determination of what records will be kept, where to keep them, and who will be responsible for maintaining them	758	3.5	0.7
Ongoing as well as a periodic review of the components of the food safety program consisting of making observations, calibrating equipment/devices, reviewing records/actions, and discussing procedures	763	3.5	0.6
Determination of who is responsible for reviewing the components of the food safety program, when the review will be done, and how it will be documented	759	3.5	0.6
Annual review and revision of the food safety program	754	3.5	0.7
Classification of all menu items into three process categories (no cook, same day, complex)	757	3.2	0.8
Written documentation of the classification of all menu items	758	3.2	0.9

Note. SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*very important*) to 1 (*not at all important*).

Next, participants were asked to indicate if their district or school had implemented each of the same 14 components using a response of “yes,” “no,” or “in progress.” Table 7 presents the status of each component for school districts, as reported by SN directors, listed in descending order according to percentage of “yes” responses. Table 8 presents the same data for schools, as reported by SN managers. At the district level, the components least likely to have been implemented included “written documentation of the classification of all menu items” (60.8% “yes” response), “classification of all menu items into three process categories (no cook, same day, complex)” (65.2% “yes” response), and “annual review and revision of the food safety program” (65.7% “yes” response). At the school level, the components least likely to have been implemented included “classification of all menu items into three process categories (no cook, same day, complex)” (70.8% “yes” response), and “written documentation of the classification of all menu items” (72.9% “yes” response).

Table 7

District Implementation of Food Safety Program Components

Statement	Yes Frequency (%)	No Frequency (%)	In Progress Frequency (%)
Monitoring of critical control points and standard operating procedures by making direct observations or taking measurements (n = 1,362)	1208 (88.7)	26 (1.9)	128 (9.4)
Standard operating procedures (written step-by-step instructions) for foodservice tasks that affect the safety of food (n = 1,373)	1145 (83.4)	37 (2.7)	191 (13.9)
Corrective actions to take when control measures are not met (n = 1,362)	1119 (82.2)	57 (4.2)	186 (13.7)
Standard operating procedures that include instructions on monitoring, documentation, corrective actions, and periodic review of the procedures (n = 1,364)	1,107 (81.2)	45 (3.3)	212 (15.5)

Table 7 continues

(Table 7 continued)

District Implementation of Food Safety Program Components

Statement	Yes Frequency (%)	No Frequency (%)	In Progress Frequency (%)
Written documentation of the results of monitoring (n = 1,367)	1,096 (80.2)	69 (5.0)	202 (14.8)
Determination of what records will be kept, where to keep them, and who will be responsible for maintaining them (n = 1,360)	1,070 (78.7)	60 (4.4)	230 (16.9)
Determination of what will be monitored, when and how often monitoring will occur, and who will be responsible for monitoring (n = 1,367)	1,075 (78.6)	69 (5.0)	223 (16.3)
Ongoing as well as a periodic review of the components of the food safety program consisting of making observations, calibrating equipment/devices, reviewing records/actions, and discussing procedures (n = 1,364)	1,048 (76.8)	56 (4.1)	260 (19.1)
Documentation of corrective actions taken (n = 1,352)	1,021 (75.5)	98 (7.2)	233 (17.2)
Determination of who is responsible for reviewing the components of the food safety program, when the review will be done, and how it will be documented (n = 1,361)	1,022 (75.1)	80 (5.9)	259 (19.0)
Training for employees on corrective actions to take when control measures are not met (n = 1,362)	1,010 (74.2)	61 (4.5)	291 (21.4)
Annual review and revision of the food safety program (n = 1,345)	883 (65.7)	124 (9.2)	338 (25.1)
Classification of all menu items into three process categories (no cook, same day, complex) (n = 1,365)	890 (65.2)	167 (12.2)	308 (22.6)
Written documentation of the classification of all menu items (n = 1,357)	825 (60.8)	187 (13.8)	345 (25.4)

Table 8

School Implementation of Food Safety Program Components

Statement	Yes Frequency (%)	No Frequency (%)	In Progress Frequency (%)
Monitoring of critical control points and standard operating procedures by making direct observations or taking measurements (n = 758)	697 (92.0)	22 (2.9)	39 (5.1)
Corrective actions to take when control measures are not met (n = 755)	681 (90.2)	36 (4.8)	38 (5.0)
Standard operating procedures that include instructions on monitoring, documentation, corrective actions, and periodic review of the procedures (n = 754)	673 (89.3)	34 (4.5)	47 (6.2)
Determination of what records will be kept, where to keep them, and who will be responsible for maintaining them (n = 754)	671 (89.0)	34 (4.5)	49 (6.5)
Ongoing as well as a periodic review of the components of the food safety program consisting of making observations, calibrating equipment/devices, reviewing records/actions, and discussing procedures (n = 757)	669 (88.4)	38 (5.0)	50 (6.6)
Determination of what will be monitored, when and how often monitoring will occur, and who will be responsible for monitoring (n = 760)	670 (88.2)	46 (6.1)	44 (5.8)
Standard operating procedures (written step-by-step instructions) for foodservice tasks that affect the safety of food (n = 759)	661 (87.1)	40 (5.3)	58 (7.6)
Written documentation of the results of monitoring (n = 754)	655 (86.9)	44 (5.8)	55 (7.3)

Table 8 continues

(Table 8 continued)

School Implementation of Food Safety Program Components

Statement	Yes Frequency (%)	No Frequency (%)	In Progress Frequency (%)
Determination of who is responsible for reviewing the components of the food safety program, when the review will be done, and how it will be documented (n = 756)	655 (86.6)	43 (5.7)	58 (7.7)
Training for employees on corrective actions to take when control measures are not met (n = 760)	647 (85.1)	47 (6.2)	66 (8.7)
Documentation of corrective actions taken (n = 757)	635 (83.9)	55 (7.3)	67 (8.9)
Annual review and revision of the food safety program (n = 749)	603 (80.5)	62 (8.3)	84 (11.2)
Written documentation of the classification of all menu items (n = 750)	547 (72.9)	105 (14.0)	98 (13.1)
Classification of all menu items into three process categories (no cook, same day, complex) (n = 751)	532 (70.8)	112 (14.9)	107 (14.2)

Then, participants indicated if their district or school had written SOPs for a list of 15 food safety tasks using a “yes” or “no” response. Table 9 presents the status of written SOPs for each food safety task for school districts, listed in descending order according to percentage of “yes” responses. Table 10 presents the same information for schools. The tasks for which districts are least likely to have written SOPs are “transporting” (78.4% “yes” response) and “purchasing” (82.5% “yes” response). The tasks for which schools are least likely to have written SOPs also are “transporting” (81.1% “yes” response) and “purchasing” (88.3% “yes” response).

Table 9

District Inclusion of Written Standard Operating Procedures for Food Safety Tasks

Statement	Yes Frequency (%)	No Frequency (%)
Cooking (n = 1,364)	1,325 (97.1)	39 (2.9)
Hand washing (n = 1,370)	1,325 (96.7)	45 (3.3)
Holding (n = 1,367)	1,316 (96.3)	51 (3.7)
Preparing (n = 1,368)	1,318 (96.3)	50 (3.7)
Cleaning/sanitizing (n = 1,364)	1,311 (96.1)	53 (3.9)
Cooling (n = 1,360)	1,305 (96.0)	55 (4.0)
Personal hygiene (n = 1,368)	1,310 (95.8)	58 (4.2)
Reheating (n = 1,347)	1,288 (95.6)	59 (4.4)
Storing (n = 1,365)	1,274 (93.3)	91 (6.7)
Calibrating thermometers (n = 1,364)	1,265 (92.7)	99 (7.3)
Receiving (n = 1,366)	1,254 (91.8)	112 (8.2)
Glove use (n = 1,364)	1,251 (91.7)	113 (8.3)

Table 9 continues

(Table 9 continued)

District Inclusion of Written Standard Operating Procedures for Food Safety Tasks

Statement	Yes Frequency (%)	No Frequency (%)
Employee health (restricting ill employees) (n = 1,365)	1,249 (91.5)	116 (8.5)
Purchasing (n = 1,359)	1,121 (82.5)	238 (17.5)
Transporting (n = 1,345)	1,054 (78.4)	291 (21.6)

Table 10

School Inclusion of Written Standard Operating Procedures for Food Safety Tasks

Statement	Yes Frequency (%)	No Frequency (%)
Hand washing (n = 762)	745 (97.8)	17 (2.2)
Personal hygiene (n = 761)	740 (97.2)	21 (2.8)
Cleaning/sanitizing (n = 759)	735 (96.8)	24 (3.2)
Cooking (n = 759)	735 (96.8)	24 (3.2)
Holding (n = 760)	732 (96.3)	28 (3.7)
Preparing (n = 759)	731 (96.3)	28 (3.7)

Table 10 continues

(Table 10 continued)

School Inclusion of Written Standard Operating Procedures for Food Safety Tasks

Statement	Yes Frequency (%)	No Frequency (%)
Cooling (n = 757)	727 (96.0)	30 (4.0)
Storing (n = 759)	727 (95.8)	32 (4.2)
Reheating (n = 747)	712 (95.6)	35 (4.7)
Employee health (restricting ill employees) (n = 759)	724 (95.4)	35 (4.6)
Receiving (n = 760)	715 (94.1)	45 (5.9)
Glove use (n = 758)	703 (92.7)	55 (7.3)
Calibrating thermometers (n = 760)	702 (92.4)	58 (7.6)
Purchasing (n = 752)	664 (88.3)	88 (11.7)
Transporting (n = 753)	611 (81.1)	142 (18.9)

Finally, participants reported whether or not documentation or recording of 11 food safety tasks occurred in their district or school, using a “yes” or “no” response. Table 11 indicates whether documentation or recording occurred for each food safety task in school districts, listed in descending order according to percentage of “yes” responses. Table 12 provides the same information for schools. The task least likely to be documented in both school districts and schools is “receiving temperatures” (65.2% and 73.3% “yes” response for districts and schools, respectively).

Table 11

District Documentation/Recording of Food Safety Tasks

Statement	Yes Frequency (%)	No Frequency (%)
Refrigerator temperatures (n = 1,373)	1,352 (98.5)	21 (1.5)
Serving temperatures (n = 1,371)	1,311 (95.6)	60 (4.4)
End-point cooking times and temperatures (n = 1,367)	1,306 (95.5)	61 (4.5)
Training conducted (n = 1,343)	1,206 (89.8)	137 (10.2)
Holding equipment temperatures (n = 1,366)	1,175 (86.0)	191 (14.0)
Corrective actions taken (n = 1,365)	1,137 (83.3)	228 (16.7)
Thermometer calibration (n = 1,363)	1,122 (82.3)	241 (17.7)
Verification or review of records (n = 1,367)	1,069 (78.2)	298 (21.8)
Dishmachine temperatures (n = 1,347)	1,052 (78.1)	295 (21.9)
Sanitation temperatures/chemical concentrations (n = 1,367)	1,066 (78.0)	301 (22.0)
Receiving temperatures (n = 1,362)	888 (65.2)	474 (34.8)

Table 12

School Documentation/Recording of Food Safety Tasks

Statement	Yes Frequency (%)	No Frequency (%)
Refrigerator temperatures (n = 766)	751 (98.0)	15 (2.0)
Serving temperatures (n = 765)	723 (94.5)	42 (5.5)
End-point cooking times and temperatures (n = 763)	713 (93.4)	50 (6.6)
Corrective actions taken (n = 756)	676 (89.4)	80 (10.6)
Verification or review of records (n = 759)	669 (88.1)	90 (11.9)
Holding equipment temperatures (n = 762)	669 (87.8)	93 (12.2)
Training conducted (n = 753)	661 (87.8)	92 (12.2)
Thermometer calibration (n = 760)	651 (85.7)	109 (14.3)
Sanitation temperatures/chemical concentrations (n = 757)	624 (82.4)	133 (17.6)
Dishmachine temperatures (n = 747)	594 (79.5)	153 (20.5)
Receiving temperatures (n = 759)	556 (73.3)	203 (26.7)

Barriers to the Implementation of Food Safety Programs Based on HACCP Principles

Participants were provided with a set of 28 potential barriers to the development and implementation of food safety programs based on HACCP principles and were asked to indicate their level of agreement that each was a barrier, using a four-point Likert-type scale of (4 = *strongly agree*, 1 = *strongly disagree*). Table 13 presents the means and standard deviations for SN directors' agreement ratings for each of the barriers in descending order of agreement. Table 14 presents the same information for SN managers. Both SN directors and managers agreed to strongly agreed that all factors assessed were barriers to implementation of food safety programs based on HACCP principles, with mean agreement ratings for individual barriers ranging from 2.6 to 3.0 for directors and from 2.7 to 3.0 for managers. In addition, no respondent gave any potential barrier a rating of 1 (*strongly disagree*). Thus, there was very little variability in the responses to this item. For both SN directors and managers, the top barriers were related to time, costs, and negative perceptions of food safety programs based on HACCP principles.

Table 13

School Nutrition Directors' Perceptions of Barriers to Implementation of Food Safety Programs Based on HACCP Principles

Statement	n	Mean ^a	SD
Time required to develop the food safety program	1,299	3.0	0.7
Perception of a food safety program based on HACCP principles as creating additional work burdens	1,303	3.0	0.7
Costs of additional labor	1,298	2.9	0.8
Costs required to update facilities	1,303	2.9	0.8
Costs required for new/additional equipment/supplies	1,305	2.9	0.7
Time required for training employees	1,302	2.9	0.7

Note. HACCP = Hazard Analysis and Critical Control Point; SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Table 13 continues

(Table 13 continued)

School Nutrition Directors' Perceptions of Barriers to Implementation of Food Safety Programs Based on HACCP Principles

Statement	n	Mean^a	SD
Time required to implement the food safety program	1,298	2.9	0.7
Burden of monitoring required with a food safety program based on HACCP principles	1,295	2.9	0.7
Burden of documentation/record keeping required with a food safety program based on HACCP principles	1,302	2.9	0.7
Costs associated with training on the food safety program	1,302	2.8	0.7
Burden of overseeing the implementation of the food safety program	1,294	2.8	0.7
Lack of employee knowledge/skill	1,302	2.8	0.7
Burden of ongoing training	1,303	2.8	0.7
Negative attitudes of employees toward the food safety program	1,302	2.7	0.8
Lack of employee support/motivation to adopt the food safety program	1,301	2.7	0.8
Facility limitations	1,302	2.7	0.7
Lack of administrative support	1,302	2.7	0.8
Need to utilize part-time employees	1,291	2.7	0.7
High employee turnover	1,297	2.7	0.8
Equipment limitations	1,298	2.7	0.7
Lack of affordable materials/opportunities for training	1,301	2.7	0.7
Lack of familiarity with HACCP principles	1,303	2.7	0.7
Perception of HACCP principles as not valuable and/or unnecessary	1,294	2.7	0.8
Lack of understanding of benefits of food safety programs based on HACCP principles	1,300	2.7	0.7

Note. HACCP = Hazard Analysis and Critical Control Point; SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Table 13 continues

(Table 13 continued)

School Nutrition Directors' Perceptions of Barriers to Implementation of Food Safety Programs Based on HACCP Principles

Statement	n	Mean^a	SD
Lack of adequate number of employees	1,299	2.6	0.8
Lack of available materials/opportunities for training	1,294	2.6	0.7
Lack of food safety/HACCP resources	1,298	2.6	0.8
Lack of training resources for diverse audiences (for example, materials in languages other than English)	1,296	2.6	0.8

Note. HACCP = Hazard Analysis and Critical Control Point; SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Table 14

School Nutrition Managers' Perceptions of Barriers to Implementation of Food Safety Programs Based on HACCP Principles

Statement	n	Mean^a	SD
Costs of additional labor	699	2.9	0.8
Costs required to update facilities	704	2.9	0.8
Costs required for new/additional equipment/supplies	701	2.9	0.7
Time required for training employees	704	2.9	0.7
Time required to develop the food safety program	705	2.9	0.8
Time required to implement the food safety program	702	2.9	0.8
Burden of documentation/record keeping required with a food safety program based on HACCP principles	705	2.9	0.8
Perception of a food safety program based on HACCP principles as creating additional work burdens	702	2.9	0.8
Costs associated with training on the food safety program	705	2.8	0.8
Negative attitudes of employees toward the food safety program	701	2.8	0.8

Note. HACCP = Hazard Analysis and Critical Control Point; SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Table 14 continues

(Table 14 continued)

School Nutrition Managers' Perceptions of Barriers to Implementation of Food Safety Programs Based on HACCP Principles

Statement	n	Mean^a	SD
Lack of employee support/motivation to adopt the food safety program	703	2.8	0.8
Facility limitations	698	2.8	0.8
Lack of adequate number of employees	702	2.8	0.8
Lack of administrative support	702	2.8	0.8
Burden of overseeing the implementation of the food safety program	704	2.8	0.8
Need to utilize part-time employees	696	2.8	0.8
Lack of employee knowledge/skill	704	2.8	0.8
Equipment limitations	698	2.8	0.8
Burden of monitoring required with a food safety program based on HACCP principles	702	2.8	0.8
Lack of familiarity with HACCP principles	707	2.8	0.8
Perception of HACCP principles as not valuable and/or unnecessary	700	2.8	0.8
Burden of ongoing training	704	2.8	0.8
Lack of understanding of benefits of food safety programs based on HACCP principles	704	2.8	0.8
High employee turnover	700	2.7	0.8
Lack of available materials/opportunities for training	705	2.7	0.8
Lack of affordable materials/opportunities for training	695	2.7	0.8
Lack of food safety/HACCP resources	700	2.7	0.8
Lack of training resources for diverse audiences (for example, materials in languages other than English)	699	2.7	0.8

Note. HACCP = Hazard Analysis and Critical Control Point; SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Practices Important in Implementing Food Safety Programs Based on HACCP Principles

Participants were asked to rate their level of agreement with a set of 24 statements identifying practices potentially important in the development and implementation of food safety programs based on HACCP principles, using a four-point Likert-type scale of (4 = *strongly agree*, 1 = *strongly disagree*). Table 15 presents the means and standard deviations for SN directors' agreement ratings for each of the practices in descending order of agreement. Table 16 presents the same information for SN managers. As was the case with perceived barriers, both SN directors and managers agreed to strongly agreed that all practices assessed were important in implementing food safety programs based on HACCP principles, with mean agreement ratings for individual practices ranging from 3.2 to 3.7 for directors and from 3.4 to 3.7 for managers. There was little variability in the responses to this item. For both SN directors and managers, the top practices important in implementing food safety programs based on HACCP principles were related to restricting ill employees from work with food, positive role modeling regarding food safety, ensuring that role expectations are understood, providing necessary training and materials, ensuring that programs are practical to apply, and gaining employee "buy-in" to programs.

Table 15

School Nutrition Directors' Perceptions of Practices Important in Implementation of Food Safety Programs Based on HACCP Principles

Statement	n	Mean^a	SD
Serving as a positive role model with respect to food safety	1,305	3.7	0.5
Ensuring ill employees do not work with food	1,303	3.7	0.5
Ensuring that all employees know their role in the food safety program	1,306	3.6	0.5
Training all employees on HACCP principles	1,299	3.6	0.5
Making available the tools, equipment, and supplies necessary to promote food safety	1,302	3.6	0.5
Ensuring that the food safety program is practical to apply	1,306	3.6	0.5
Gaining employee commitment to food safety and HACCP principles	1,304	3.6	0.5
Providing ongoing food safety training for all employees	1,302	3.6	0.5
Providing effective supervision of employees regarding food safety	1,302	3.5	0.6
Giving verbal reminders and praise to employees with respect to food safety tasks	1,307	3.5	0.6
Considering food safety program implementation an ongoing process	1,304	3.5	0.6
Ensuring that the food safety program is employee-focused	1,305	3.5	0.6
Requiring new employees to complete food safety training before handling food	1,306	3.4	0.7
Requiring food safety certification for management and supervisory employees	1,305	3.4	0.7

Note. HACCP = Hazard Analysis and Critical Control Point; SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Table 15 continues

(Table 15 continued)

School Nutrition Directors' Perceptions of Practices Important in Implementation of Food Safety Programs Based on HACCP Principles

Statement	n	Mean ^a	SD
Setting a realistic timeline for implementation of the food safety program	1,305	3.4	0.6
Implementing the food safety program in stages consisting of small, achievable steps	1,304	3.4	0.7
Using signs/notices in key areas to serve as reminders of safe food handling practices	1,300	3.4	0.6
Making food safety practices part of employee evaluation	1,299	3.4	0.7
Selecting or updating equipment to support food safety	1,305	3.3	0.7
Developing education programs to address barriers to implementing the food safety program	1,300	3.3	0.7
Developing tools for self-assessment of food safety programs	1,302	3.3	0.7
Taking disciplinary action with employees who do not follow food safety policies and procedures	1,306	3.3	0.7
Designing, selecting, or modifying facilities to promote food safety	1,306	3.2	0.7
Working with school district/administrators to develop a strong food safety policy	1,304	3.2	0.8

Note. HACCP = Hazard Analysis and Critical Control Point; SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Table 16

School Nutrition Managers' Perceptions of Practices Important in Implementation of Food Safety Programs Based on HACCP Principles

Statement	n	Mean^a	SD
Ensuring ill employees do not work with food	713	3.8	0.5
Serving as a positive role model with respect to food safety	711	3.7	0.5
Ensuring that all employees know their role in the food safety program	712	3.7	0.5
Training all employees on HACCP principles	709	3.7	0.5
Making available the tools, equipment, and supplies necessary to promote food safety	709	3.7	0.5
Ensuring that the food safety program is practical to apply	709	3.6	0.5
Gaining employee commitment to food safety and HACCP principles	709	3.6	0.5
Providing ongoing food safety training for all employees	710	3.6	0.6
Providing effective supervision of employees regarding food safety	711	3.6	0.6
Giving verbal reminders and praise to employees with respect to food safety tasks	712	3.6	0.6
Considering food safety program implementation an ongoing process	709	3.6	0.6
Selecting or updating equipment to support food safety	709	3.5	0.6
Requiring new employees to complete food safety training before handling food	712	3.5	0.6
Requiring food safety certification for management and supervisory employees	711	3.5	0.7
Setting a realistic timeline for implementation of the food safety program	710	3.5	0.6
Implementing the food safety program in stages consisting of small, achievable steps	711	3.5	0.6

Note. HACCP = Hazard Analysis and Critical Control Point; SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Table 16 continues

(Table 16 continued)

School Nutrition Managers' Perceptions of Practices Important in Implementation of Food Safety Programs Based on HACCP Principles

Statement	n	Mean ^a	SD
Using signs/notices in key areas to serve as reminders of safe food handling practices	712	3.5	0.6
Working with school district/administrators to develop a strong food safety policy	710	3.5	0.6
Making food safety practices part of employee evaluation	713	3.5	0.7
Taking disciplinary action with employees who do not follow food safety policies and procedures	710	3.5	0.6
Ensuring that the food safety program is employee-focused	710	3.5	0.6
Designing, selecting, or modifying facilities to promote food safety	709	3.4	0.7
Developing education programs to address barriers to implementing the food safety program	710	3.4	0.6
Developing tools for self-assessment of food safety programs	711	3.4	0.7

Note. HACCP = Hazard Analysis and Critical Control Point; SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Perceived Food Safety Knowledge and Skill

Participants were asked to rate their perceived level of knowledge and skills related to food safety, using a four-point Likert-type scale (4 = *excellent*, 1 = *poor*). First, a set of seven general food safety-related items (5 of 7 regarding knowledge, and 2 of 7 regarding skill) were assessed. These items were common to both SN directors and managers. Table 17 presents the means and standard deviations for SN directors' perceived degree of knowledge or skill for each item, in descending order of knowledge or skill rating. Table 18 presents the same data for SN managers. SN directors' knowledge and skill levels were generally perceived as "good" for all

items assessed, with mean ratings for individual items ranging from 3.1 to 3.4. School nutrition managers' knowledge and skill levels were generally perceived as "good" to "excellent" for the items assessed, with mean ratings for individual items ranging from 3.1 to 3.6. T-tests were used to compare SN directors' and managers' food safety-related knowledge and skill levels. Results indicated that there were no significant differences between directors and managers for any of the general knowledge or skill statements.

Table 17

School Nutrition Directors' Perceived General Food Safety Knowledge and Skills

Statement	n	Mean^a	SD
Knowledge Statements			
HACCP principles	1,301	3.2	0.6
How to apply HACCP principles to your district or school food safety program	1,294	3.2	0.6
How to comply with federal regulations regarding a food safety program based on HACCP principles	1,299	3.1	0.67
How to address food safety program deficiencies	1,298	3.1	0.6
How to provide food safety training to school nutrition staff	1,297	3.1	0.7
Skill Statements			
Serving as a role model for following good food safety practices	1,298	3.4	0.6
Supervising foodservice employees in following good food safety practices and implementing a food safety program	1,297	3.3	0.6

Note. SD = standard deviation; HACCP = Hazard Analysis and Critical Control Point.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*excellent*) to 1 (*poor*).

Table 18

School Nutrition Managers' Perceived General Food Safety Knowledge and Skills

Statement	n	Mean^a	SD
Knowledge Statements			
HACCP principles	708	3.2	0.7
How to apply HACCP principles to your district or school food safety program	709	3.2	0.6
How to comply with federal regulations regarding a food safety program based on HACCP principles	708	3.1	0.7
How to address food safety program deficiencies	707	3.1	0.7
How to provide food safety training to school nutrition staff	706	3.0	0.7
Skill Statements			
Serving as a role model for following good food safety practices	698	3.6	0.5
Supervising foodservice employees in following good food safety practices and implementing a food safety program	694	3.6	0.5

Note. SD = standard deviation; HACCP = Hazard Analysis and Critical Control Point.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*excellent*) to 1 (*poor*).

Next, National Food Service Management Institute (NFSMI) competencies specific to SN directors or managers, including both knowledge and skill statements, were assessed. Again, degree of knowledge and level of skill were assessed using a four-point Likert-type scale (4 = *excellent*, 1 = *poor*). Tables 19 and 20 present the means and standard deviations for SN directors' perceived degree of knowledge and level of skill for each NFSMI knowledge (Table 19) and skill (Table 20) statement, in descending order of knowledge or skill rating. Tables 21

and 22 present the same information for SN managers. School nutrition directors' knowledge and skill levels were generally perceived as "good" for all items assessed, with mean ratings for individual items ranging from 2.7 to 3.4 for knowledge statements and from 3.1 to 3.3 for skill statements. Directors' degree of knowledge was lowest for "principles of food biosecurity" (2.7 ± 0.8). School nutrition managers' knowledge and skill levels were generally perceived as "good" to "excellent" for the items assessed, with mean ratings for individual items ranging from 3.0 to 3.7 for knowledge statements and from 3.2 to 3.6 for skill statements. Overall, it appears that managers perceived themselves to have slightly greater knowledge and skill levels with respect to their specific competencies than did directors with respect to their competencies. It is important to emphasize, however, that perceived, rather than actual, knowledge and skill level were assessed in this survey.

Table 19

School Nutrition Directors' Perceived Knowledge of NFSMI Food Safety Knowledge Statements

Statement	n	Mean ^a	SD
Basic principles and techniques of foodservice sanitation and food safety	1,302	3.4	0.6
Principles of foodborne illness prevention	1,297	3.4	0.6
Federal, state, and local sanitation and food safety requirements	1,300	3.2	0.6
Fundamentals of HACCP-based standard operating procedures	1,297	3.2	0.6
The importance of all aspects of food defense	1,298	3.2	0.7
Principles of food biosecurity	1,291	2.7	0.8

Note. NFSMI = National Food Service Management Institute; SD = standard deviation; HACCP = Hazard Analysis and Critical Control Point.

^aThe response was a 4-point Likert-type scale ranging from 4 (*excellent*) to 1 (*poor*).

Table 20

School Nutrition Directors' Perceived Skill Related to NFSMI Food Safety Skill Statements

Statement	n	Mean^a	SD
Ensuring that all food safety inspection deficiencies are addressed competently and in a timely manner	1,298	3.3	0.6
Conducting routine food safety and sanitation inspections at each school nutrition site and developing corrective action plans, as needed	1,286	3.2	0.7
Developing a food safety program that meets federal, state, and local regulations	1,298	3.1	0.7
Developing a sanitation training program for school nutrition staff	1,296	3.1	0.7
Developing emergency procedures and practices for food recalls and foodborne illnesses	1,294	3.1	0.7
Establishing communication procedures within the school district regarding food safety issues	1,299	3.1	0.7

Note. NFSMI = National Food Service Management Institute; SD = standard deviation.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*excellent*) to 1 (*poor*).

Table 21

School Nutrition Managers' Perceived Knowledge of NFSMI Food Safety Knowledge Statements

Statement	n	Mean^a	SD
Principles of personal hygiene	704	3.7	0.5
Basic principles of foodservice sanitation for equipment, personnel, food, and facility	707	3.5	0.6
Procedures to follow that prevent foodborne illness	703	3.5	0.6
Techniques for keeping food secure when in storage	703	3.5	0.5
Principles of a food safety program based on HACCP principles	705	3.4	0.6
Importance of school district maintaining a food safety policy	704	3.4	0.6
Importance of verifying safety and security of food items received from vendors	703	3.4	0.6
Appropriate control techniques for insect and rodent contamination	705	3.3	0.7
Causes of foodborne illnesses and infections, their characteristics, and the most commonly infected foods	706	3.3	0.6
Methods for training staff on safe food handling techniques	704	3.3	0.7
Sources of food safety information for the school nutrition program operation	701	3.3	0.6
State and local code requirements for foodservice establishments	708	3.0	0.7

Note. NFSMI = National Food Service Management Institute; SD = standard deviation; HACCP = Hazard Analysis and Critical Control Point.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*excellent*) to 1 (*poor*).

Table 22

School Nutrition Managers' Perceived Skill Related to NFSMI Food Safety Skill Statements

Statement	n	Mean^a	SD
Implementing a system to protect food at all times from contamination agents such as unclean equipment and utensils, pests and rodents, unnecessary handling, poor hygiene habits, and inadequate sanitary facilities	702	3.6	0.5
Implementing and maintaining a practice of handling clean and sanitized equipment and utensils to protect them from contamination	703	3.6	0.5
Observing rules of time and temperature relationships for food handling and preparation	702	3.6	0.5
Implementing proper food handling techniques to prevent foodborne illness	702	3.6	0.5
Ensuring process for maintaining food at the proper temperature at all times during freezing, thawing, preparing, holding, and serving	702	3.6	0.5
Implementing rules of safe practice for handling or discarding leftover foods	702	3.6	0.5
Enforcing rules of health, cleanliness, personal habits, and proper clothing to ensure clean and healthy food handlers	701	3.6	0.5
Correcting foodservice deficiencies noted on sanitation inspection reports by Public Health Department	701	3.6	0.5
Maintaining a copy of state and local health regulations at the school site	699	3.6	0.6
Implementing a schedule for thoroughly cleaning and sanitizing all utensils, equipment, food preparation areas, counters, walls, and floors	703	3.5	0.6

Note. NFSMI = National Food Service Management Institute; SD = standard deviation; HACCP = Hazard Analysis and Critical Control Point.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*excellent*) to 1 (*poor*).

Table 22 continues

(Table 22 continued)

School Nutrition Managers' Perceived Skill Related to NFSMI Food Safety Skill Statements

Statement	n	Mean^a	SD
Implementing principles of sanitary food handling using HACCP or other appropriate systems	703	3.5	0.6
Maintaining daily temperature records of the dry storage areas, refrigeration equipment, and dishwashing equipment, noting deficiencies and corrections	704	3.5	0.6
Planning a system to display and serve food safely that includes sneeze-guards and length of time food is on display	697	3.5	0.6
Implementing a system for receiving and storage of food that uses good housekeeping procedures to reduce the potential for insect and rodent infestation	701	3.5	0.5
Implementing a system of properly using, cleaning, and disinfecting approved garbage and trash receptacles and area regularly	698	3.4	0.6
Calibrating food thermometers regularly to ensure accuracy	697	3.4	0.7
Evaluating pest control products and services for effectiveness when they are approved for use in the school's foodservice department	696	3.3	0.8
Establishing checklist procedures for inspecting products upon delivery with regard to safety and sanitation	700	3.3	0.7
Providing food safety training for staff	699	3.3	0.7
Applying district or local guidelines to reduction and recycling of waste and other discarded products	694	3.2	0.8

Note. NFSMI = National Food Service Management Institute; SD = standard deviation; HACCP = Hazard Analysis and Critical Control Point.

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*excellent*) to 1 (*poor*).

Food Safety Information, Training, and Resources

Participants were asked to indicate sources from which they obtain food safety information. Table 23 provides sources of food safety information utilized by SN directors, ranked in descending order. Table 24 contains the same information for SN managers. Sources of food safety information used by a majority of directors included USDA (85.4%), state or local health department (81.9%), School Nutrition Association (81.1%), NFSMI (80.2%), ServSafe® (67.3%), and state agency (57.0%). Sources of food safety information used by a majority of managers included state or local health department (79.8%), School Nutrition Association (79.0%), USDA (78.0%), ServSafe® (67.0%), and NFSMI (60.0%).

Table 23

School Nutrition Directors' Sources of Food Safety Information

Source (n = 1,274)	Frequency	%
United States Department of Agriculture	1,088	85.4
State or local health department	1,043	81.9
School Nutrition Association	1,033	81.1
National Food Service Management Institute	1,022	80.2
ServSafe®	857	67.3
State agency	726	57.0
Federal or state food codes	567	44.5
United States Food and Drug Administration	499	39.2
Centers for Disease Control and Prevention	440	34.5
Serving It Safe	439	34.5
National Restaurant Association	305	23.9
Food Handler's program	261	20.5
Commercial foodservice management, food, or equipment company	237	18.6
State Cooperative Extension Service	190	14.9
University food science/nutrition departments	150	11.8
National Restaurant Association Educational Foundation	142	11.1
United States Environmental Protection Agency	100	7.8
Partnership for Food Safety Education	96	7.5

Table 24

School Nutrition Managers' Sources of Food Safety Information

Source (n = 682)	Frequency	%
State or local health department	544	79.8
School Nutrition Association	539	79.0
United States Department of Agriculture	532	78.0
ServSafe®	457	67.0
National Food Service Management Institute	409	60.0
United States Food and Drug Administration	329	48.2
Federal or state food codes	295	43.3
State agency	249	36.5
Centers for Disease Control and Prevention	229	33.6
Serving It Safe	218	32.0
Food Handler's program	153	22.4
Commercial foodservice management, food, or equipment company	139	20.4
Partnership for Food Safety Education	109	16.0
United States Environmental Protection Agency	87	12.8
State Cooperative Extension Service	86	12.6
University food science/nutrition departments	76	11.1
National Restaurant Association	74	10.9
National Restaurant Association Educational Foundation	31	4.5

Participants were asked if food safety certification was required for managers or employees in their districts or schools, respectively. They were then asked to identify the primary source used to provide basic food safety training for managers or employees. The majority of both SN directors (73.8%) and managers (59.9%) reported that food safety certification was required for managers in their districts or employees in their schools, respectively. A majority of SN directors reported that ServSafe® (54.7%) was the primary source used to provide basic food safety training to managers in their districts, followed by Serving It Safe (17.0%), other (16.2%), and Food Handler's Program (12.1%). The largest percentage of SN managers also used ServSafe® (48.3%) as the primary source of basic food safety training for employees in their schools, followed by Serving It Safe (19.1%), Food Handler's program (17.3%), and other (15.3%).

The next two items asked participants to identify their preferred formats for receiving personal information or training related to food safety and their preferred formats for providing information or training to employees. Tables 25 and 26 list preferred formats for receiving personal food safety information or training for SN directors and managers, respectively, ranked in descending order. Tables 27 and 28 list preferred formats for providing food safety information or training to employees for directors and managers, respectively. Both SN directors and managers indicated preferences for printed information/materials, followed by in-person training, for receiving personal information or training as well as providing information or training to employees.

Table 25

School Nutrition Directors' Preferred Format for Personal Food Safety Information/Training

Source (n = 1,267)	Frequency	%
Printed information/materials	956	75.5
In-person training (seminars, workshops, inservice training)	874	69.0
CD or disk containing information/materials	666	52.6
Information/materials downloaded from Web site	584	46.1
State or national conferences or meetings	582	45.9
Video/DVD training	536	42.3
Microsoft PowerPoint presentations/slides	467	36.9
Web-based courses	378	29.8
Webinars (Web-based seminars)	370	29.2
Professional books, journals, and/or magazines	311	24.5
Consultation with an external expert/mentor	227	17.9

Table 26

School Nutrition Managers' Preferred Format for Personal Food Safety Information/Training

Source (n = 684)	Frequency	%
Printed information/materials	574	83.9
In-person training (seminars, workshops, inservice training)	511	74.7
Video/DVD training	257	37.6
CD or disk containing information/materials	252	36.8
State or national conferences or meetings	231	33.8
Information/materials downloaded from Web site	227	33.2
Professional books, journals, and/or magazines	180	26.3
Microsoft PowerPoint presentations/slides	178	26.0
Web-based courses	131	19.2
Consultation with an external expert/mentor	93	13.6
Webinars (Web-based seminars)	75	11.0

Table 27

School Nutrition Directors' Preferred Format for Providing Food Safety Information/Training to Employees

Source (n = 1,262)	Frequency	%
Printed information/materials	1,122	88.9
In-person training (seminars, workshops, inservice training)	982	77.8
Microsoft PowerPoint presentations/slides	431	34.2
Video/DVD training	429	34.0
Information/materials downloaded from Web site	371	29.4
State or national conferences or meetings	340	26.9
CD or disk containing information/materials	302	23.9
Professional books, journals, and/or magazines	192	15.2
Consultation with an external expert/mentor	173	13.7
Web-based courses	123	9.7
Webinars (Web-based seminars)	70	5.5

Table 28

School Nutrition Managers' Preferred Format for Providing Food Safety Information/Training to Employees

Source (n = 676)	Frequency	%
Printed information/materials	615	91.0
In-person training (seminars, workshops, inservice training)	497	73.5
Video/DVD training	214	31.7
Information/materials downloaded from Web site	186	27.5
State or national conferences or meetings	173	25.6
CD or disk containing information/materials	143	21.2
Microsoft PowerPoint presentations/slides	142	21.0
Professional books, journals, and/or magazines	133	19.7
Consultation with an external expert/mentor	68	10.1
Web-based courses	37	5.5
Webinars (Web-based seminars)	30	4.4

Of interest was whether SN directors' preferred formats for receiving personal information or training related to food safety and their preferred formats for providing information or training to employees differed with respect to school district size. Within each district size (small [$\leq 2,799$], medium [2,800-29,999], and large [$\geq 30,000$]), SN directors still ranked printed information/materials, followed by in-person training, as the top two preferred formats for both receiving personal information or training and providing information and training to employees (data not shown). However, there were some other differences observed according to district size. In terms of SN directors' preferred formats for receiving personal

information or training related to food safety, as district size increased, so did the preference for information/materials downloaded from Web sites, Webinars, Microsoft PowerPoint presentations/slides, state or national conferences or meetings, and professional books, journals, and/or magazines. In terms of SN directors' preferred formats for providing information or training to employees, as district size increased, so did the preference for information/materials downloaded from Web sites, video/DVD training, Microsoft PowerPoint presentations/slides, and state or national conferences or meetings. Thus, it appears that SN directors in larger districts may be more willing than those in smaller districts to utilize additional technologies, materials, and travel to obtain and provide food safety information or training.

Next, participants were asked to rate their level of agreement that a list of 18 resources would be helpful in the development and implementation of food safety programs based on HACCP principles, using a four-point Likert-type scale (4 = *strongly agree*, 1 = *strongly disagree*). Table 29 presents the means and standard deviations for SN directors' agreement ratings for each of the resources in descending order of agreement. Table 30 presents the same data for SN managers. Both SN directors and managers agreed to strongly agreed that all of the resources would be helpful in developing and implementing food safety programs based on HACCP principles, with mean ratings for individual resources ranging from 2.8 to 3.5 and 2.9 to 3.5 for directors and managers, respectively.

Table 29

School Nutrition Directors' Perceptions Regarding Resources Helpful in Implementing Food Safety Programs Based on HACCP Principles

Resource	n	Mean ^a	SD
<i>USDA Guidance</i>	1,250	3.5	0.5
Training/resources from ServSafe®, Serving It Safe, and/or Food Handler's program	1,228	3.5	0.6
Sample food safety programs based on HACCP principles designed for school foodservice	1,228	3.5	0.6
Sample standard operating procedures	1,235	3.5	0.5
Sample documentation/record forms	1,231	3.5	0.5
Standardized recipes with critical control points and critical limits identified	1,231	3.5	0.6
Training programs from NFSMI	1,227	3.4	0.6
Resources from NFSMI	1,220	3.4	0.6
Training/resources from state agency	1,227	3.4	0.6
Training/resources from state or local health department	1,224	3.3	0.6
Self-assessment tools to use for internal program reviews	1,210	3.3	0.6
Training/resources from national/professional organization	1,192	3.2	0.6
Case study examples of implementation of food safety programs based on HACCP principles in other districts/schools	1,170	3.2	0.7
Mentoring by more experienced directors/managers	1,203	3.1	0.7
Training/resources from school district	1,192	3.0	0.7
Training/resources from university and/or Cooperative Extension Service	1,167	3.0	0.7
Training/resources from commercial foodservice management, food, and/or equipment companies	1,173	2.8	0.7
Training/resources from an external consultant	1,164	2.8	0.8

Note. HACCP = Hazard Analysis Critical Control Point; SD = standard deviation; USDA = United States Department of Agriculture; NFSMI = National Food Service Management Institute; *USDA Guidance* = *Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles* (USDA, 2005).

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Table 30

School Nutrition Managers' Perceptions Regarding Resources Helpful in Implementing Food Safety Programs Based on HACCP Principles

Resource	n	Mean ^a	SD
<i>USDA Guidance</i>	665	3.5	0.5
Training/resources from ServSafe®, Serving It Safe, and/or Food Handler's program	654	3.5	0.6
Sample food safety programs based on HACCP principles designed for school foodservice	655	3.5	0.5
Standardized recipes with critical control points and critical limits identified	649	3.5	0.6
Training/resources from state agency	644	3.4	0.6
Sample standard operating procedures	646	3.4	0.6
Training/resources from state or local health department	651	3.4	0.6
Sample documentation/record forms	638	3.4	0.6
Training programs from NFSMI	642	3.3	0.6
Resources from NFSMI	639	3.3	0.6
Training/resources from school district	635	3.3	0.7
Self-assessment tools to use for internal program reviews	627	3.3	0.6
Training/resources from national/professional organization	625	3.2	0.6
Mentoring by more experienced directors/managers	632	3.2	0.7
Case study examples of implementation of food safety programs based on HACCP principles in other districts/schools	619	3.2	0.7
Training/resources from university and/or Cooperative Extension Service	617	3.1	0.7
Training/resources from commercial foodservice management, food, and/or equipment companies	625	3.0	0.7
Training/resources from an external consultant	609	2.9	0.8

Note. HACCP = Hazard Analysis Critical Control Point; SD = standard deviation; USDA = United States Department of Agriculture; NFSMI = National Food Service Management Institute; *USDA Guidance* = *Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles* (USDA, 2005).

^aThe response scale was a 4-point Likert-type scale ranging from 4 (*strongly agree*) to 1 (*strongly disagree*).

Finally, participants indicated which of these same resources their districts or schools had actually utilized in developing and implementing a food safety program based on HACCP principles. Table 31 presents the resources utilized by SN directors, in descending order. Table 32 presents the same information for SN managers. The main resources utilized by both SN directors and managers include training and/or resources from programs such as ServSafe®, Serving It Safe, and/or Food Handler's programs, the USDA guidance document, and training and/or resources from state agencies.

Table 31

School Nutrition Directors' Utilization of Resources in Implementing Food Safety Programs Based on HACCP Principles

Resource (n = 1, 250)	Frequency	%
Training/resources from ServSafe®, Serving It Safe, and/or Food Handler's program	829	66.3
<i>USDA Guidance</i>	811	64.9
Training/resources from state agency	767	61.4
Sample standard operating procedures	715	57.2
Sample documentation/record forms	655	52.4
Training/resources from state or local health department	636	50.9
Sample food safety programs based on HACCP principles designed for school foodservice	604	48.3
Training programs from NFSMI	357	28.6
Standardized recipes with critical control points and critical limits identified	559	44.7
Resources from NFSMI	519	41.5
Training/resources from national/professional organization	280	22.4
Self-assessment tools to use for internal program reviews	265	21.2
Training/resources from school district	257	20.6
Training/resources from university and/or Cooperative Extension Service	172	13.8
Mentoring by more experienced directors/managers	158	12.6
Training/resources from commercial foodservice management, food, and/or equipment companies	156	12.5
Training/resources from an external consultant	122	9.8
Case study examples of implementation of food safety programs based on HACCP principles in other districts/schools	101	8.1

Note. HACCP = Hazard Analysis Critical Control Point; USDA = United States Department of Agriculture; NFSMI = National Food Service Management Institute; *USDA Guidance* = *Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles* (USDA, 2005).

Table 32

School Nutrition Managers' Utilization of Resources in Implementing Food Safety Programs Based on HACCP Principles

Resource (n = 1, 250)	Frequency	%
Training/resources from ServSafe®, Serving It Safe, and/or Food Handler's program	435	66.5
<i>USDA Guidance</i>	428	65.4
Standardized recipes with critical control points and critical limits identified	370	56.6
Training/resources from state or local health department	347	53.1
Training/resources from state agency	346	52.9
Sample standard operating procedures	344	52.6
Sample food safety programs based on HACCP principles designed for school foodservice	341	52.1
Sample documentation/record forms	341	52.1
Training/resources from school district	262	40.1
Training programs from NFSMI	196	30.0
Resources from NFSMI	188	28.7
Mentoring by more experienced directors/managers	158	24.2
Self-assessment tools to use for internal program reviews	155	23.7
Training/resources from national/professional organization	137	20.9
Training/resources from commercial foodservice management, food, and/or equipment companies	106	16.2
Case study examples of implementation of food safety programs based on HACCP principles in other districts/schools	98	15.0
Training/resources from university and/or Cooperative Extension Service	88	13.5
Training/resources from an external consultant	62	9.5

Note. HACCP = Hazard Analysis Critical Control Point; USDA = United States Department of Agriculture; NFSMI = National Food Service Management Institute; *USDA Guidance* = *Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles* (USDA, 2005).

CONCLUSIONS AND RECOMMENDATIONS

Limitations to the Research Study

A limitation to this research study was the overall response rate to the online survey. At 9.2%, the response rate was much lower than desired, although it is typical for online surveys to receive much lower response rates than surveys administered on paper (Nulty, 2008). The use of an online survey, which requires internet access in addition to a degree of technology skill, may have prevented some school nutrition (SN) directors or managers from participating in the study. In addition, the majority of the SN directors participating in the study were from small school districts; there was very little representation from large school districts. All of these issues may cause concern for the ability to generalize the results.

Research Study Conclusions

The primary objective of this research was to assess the extent to which SN programs have implemented food safety programs based on Hazard Analysis and Critical Control Point (HACCP) principles, as required by Section 111 of the Child Nutrition and WIC Reauthorization Act of 2004 (Public Law 108-265). Results indicated that although the vast majority of SN directors and managers surveyed reported that their districts and schools, respectively, had implemented food safety programs based on HACCP principles, a more detailed status assessment revealed that the implementation process was often not complete. In addition, the components of the food safety programs in SN programs were assessed. Results indicated that school food safety programs did not include all components required for a program consistent with HACCP principles, as outlined in the United States Department of Agriculture (USDA) document *Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles*.

Motivations for adopting food safety programs based on HACCP principles also were investigated. The main motivations reported for implementing these programs included meeting state agency requirements and improving the safety of foods served. Thus, it appears that a perceived state agency requirement, rather than awareness of the federal law, was often driving the adoption of these programs. Finally, several characteristics of SN directors or school districts were found to be associated with implementation status of food safety programs based on HACCP principles. Directors who had worked in SN programs for more than 20 years, school districts in the Southwest region, and larger school districts were all more likely to have implemented food safety programs based on HACCP principles.

Barriers and practices related to the implementation of school food safety programs based on HACCP principles were investigated. For both SN directors and managers, the top barriers to implementation were related to time, costs, and negative perceptions of food safety programs based on HACCP principles. The top practices important in implementing food safety programs based on HACCP principles were related to restricting ill employees from work with food, positive role modeling regarding food safety, ensuring that role expectations are understood, providing necessary training and materials, ensuring that programs are practical to apply, and gaining employee “buy-in” to programs.

Perceived knowledge and skills related to food safety were evaluated. In general, SN directors perceived their food safety-related knowledge and skills as “good,” while SN managers perceived their food safety-related knowledge and skills as “good” to “excellent.” Thus, SN managers perceived themselves as having slightly greater knowledge and skill levels than did SN directors. It is important to emphasize, however, that perceived, rather than actual, knowledge and skills level were assessed in this study.

Sources of food safety information and preferred format for food safety information and training were examined. Sources of food safety information used by a majority of both SN directors and managers included USDA, state or local health departments, School Nutrition Association, National Food Service Management Institute, and ServSafe®. Both SN directors and managers indicated a preference for printed information/materials, followed by in-person training, for receiving personal information or training as well as providing information or training to employees.

Finally, resources and training needs for the implementation of school food safety programs based on HACCP principles were investigated. Although the participants agreed that all of the resources assessed were potentially helpful, the main resources utilized by both SN directors and managers included training and/or resources from programs such as ServSafe®, Serving It Safe, and/or Food Handler's programs, the USDA guidance document, and training and/or resources from state agencies.

In conclusion, although SN programs were required by law to implement food safety programs based on HACCP principles by the end of the 2005-2006 school year, many districts and schools still had not completed the implementation process. In addition, although SN directors and managers reported good food safety-related knowledge and skill levels, current school food safety programs did not include all components required for a program consistent with HACCP principles, as outlined in the USDA guidance document. Study results identified motivations, characteristics, barriers, and practices related to the implementation of school food safety programs based on HACCP principles, as well as preferred routes for the dissemination of food safety-related information and training. These factors will be helpful in achieving greater implementation of food safety programs based on HACCP principles in SN programs.

Education and Training Implications

Findings from this research suggest the following implications for education and training:

- Although federal law required that food safety programs based on HACCP principles be implemented in SN programs by the end of the 2005-2006 school year, the implementation process was not complete in many programs. Thus, there is a continued need for education and training related to this issue. Education and training programs and materials could be geared toward those SN programs with less likelihood of having implemented these food safety programs, such as smaller school districts.
- One school food safety program component that emerged as particularly lacking in this study was the classification of menu items into process categories and the documentation of this classification. Thus, educational materials and training programs should address this issue, and standardized recipes provided to districts should include classification information.
- Study results could be helpful in developing and promoting resources and training programs specifically for use at the local school district level. In addition, existing resources and training programs must be assessed when new regulations emerge and be removed or modified if they are not consistent with new guidelines. It is important to have a process in place for developing, assessing, and updating resources that support local school districts when regulations change.
- Barriers to implementation of food safety programs based on HACCP principles and practices supporting implementation identified in this study can be used to promote and support implementation efforts at the local school district level. Barriers that must be addressed included time constraints, cost issues, and negative perceptions about

food safety programs based on HACCP principles. Role modeling and training are important practices when implementing these programs. SN directors and managers must serve as positive role models with respect to food safety. Employees must understand their expected roles in food safety programs and have the knowledge and skills necessary to fulfill these roles.

- An opportunity exists for the USDA to partner with state agencies in providing information, training, and follow-up related to the effective implementation of food safety programs based on HACCP principles in SN programs. Study results indicate that SN directors and managers rely on state agencies for guidelines, information, and resources related to food safety.
- State agencies should communicate with school district administrators regarding updated food safety regulations. The school food authority, which includes the district school superintendent and school board, must be in compliance with new regulations. Information sharing must occur so that the school administration can also promote and support food safety efforts, as it is their responsibility to do so.

Research Implications

Findings from this study suggest the need for additional research in the following areas:

- The issue of access to technology and preferred methods for obtaining food safety-related information and training via various technologies needs further study. These issues should be further examined in relation to factors such as school district size and resource availability.
- Additional data from large school districts is needed, as the respondents in the current study were primarily from small and medium districts. Although there are fewer large

districts, their enrollment is great, with the potential to positively or negatively influence food safety issues nationwide.

- Research examining how state agencies have supported and promoted the implementation of food safety programs based on HACCP principles would be helpful. Agencies which have been successful at promoting implementation of these programs can offer insight and strategies that would be useful in supporting further implementation efforts. Also of interest is which strategies and resources have proved most helpful for school districts of various sizes, since implementation status of programs varies by district size.

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APPENDIX

Survey Instrument

Introduction

We are interested in the food safety programs and procedures in place in schools participating in federal meal programs. In addition, we are interested in needs associated with developing and implementing food safety programs. Please help us better meet your needs by answering the following questions about your district or school.

The survey will take about 20 minutes to complete. Please begin the survey at a time when you are able to complete it at one sitting, as you will be presented with a new survey each time you access the survey Web site.

Click the "Next" button below to begin the survey.

Routing Question

*** Which job title BEST describes your position?**

- ☐ School Nutrition Director
- ☐ School Nutrition Manager

Director Implementation

How many schools in your district have written standard operating procedures for food safety?

- ☐ All schools
- ☐ Some schools
- ☐ None of the schools

How many schools in your district have implemented food safety programs based on Hazard Analysis and Critical Control Point (HACCP) principles?

- ☐ All schools
- ☐ Some schools
- ☐ None of the schools
- ☐ I don't know/I am not familiar with the requirement for a food safety program.

*** Which of the following best describes the development and implementation status of food safety programs based on HACCP principles in your district?**

- ☐ My district has not begun to develop food safety programs based on HACCP principles for its schools.
- ☐ My district is in the process of developing food safety programs based on HACCP principles for its schools.
- ☐ My district has developed food safety programs based on HACCP principles for its schools, but has not begun implementation of the programs.
- ☐ My district is in the process of implementing food safety programs based on HACCP principles for its schools.
- ☐ My district has completely implemented food safety programs based on HACCP principles in its schools.

Director Follow-up 1

When did your district implement food safety programs based on HACCP principles?

- ☐ Prior to the 2005-2006 school year
- ☐ During the 2005-2006 school year
- ☐ During the 2006-2007 school year
- ☐ During the 2007-2008 school year
- ☐ During the 2008-2009 school year
- ☐ During the 2009-2010 school year

Director Follow-up 2

What was the motivation for developing and/or implementing a food safety program based on HACCP principles in your district? Check all that apply.

- ☐ Improvement in safety of foods served
- ☐ Previous incident of foodborne illness in district/school
- ☐ Awareness of risk/consequences of foodborne illness
- ☐ Way to reduce liability
- ☐ Way to save time
- ☐ Way to save money
- ☐ Awareness of HACCP as the best approach to food safety
- ☐ Requirement of state agency overseeing school nutrition programs
- ☐ Requirement of federal law
- ☐ Other (please specify below)

Director Components

Implementation of Food Safety Programs Based on HACCP Principles
in School Nutrition Programs

How important is each of the following in a food safety program?

	Very Important	Important	Somewhat Important	Not At All Important
Standard operating procedures (written step-by-step instructions) for foodservice tasks that affect the safety of food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Standard operating procedures that include instructions on monitoring, documentation, corrective actions, and periodic review of the procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Classification of all menu items into three process categories (no cook, same day, complex)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written documentation of the classification of all menu items	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of what will be monitored, when and how often monitoring will occur, and who will be responsible for monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Monitoring of critical control points and standard operating procedures by making direct observations or taking measurements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written documentation of the results of monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Corrective actions to take when control measures are not met	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training for employees on corrective actions to take when control measures are not met	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Documentation of corrective actions taken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of what records will be kept, where to keep them, and who will be responsible for maintaining them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ongoing as well as a periodic review of the components of the food safety program consisting of making observations, calibrating equipment/devices, reviewing records/actions, and discussing procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of who is responsible for reviewing the components of the food safety program, when the review will be done, and how it will be documented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Annual review and revision of the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Has your district implemented the following food safety program components?

	No	Yes	In Progress
Standard operating procedures (written step-by-step instructions) for foodservice tasks that affect the safety of food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Standard operating procedures that include instructions on monitoring, documentation, corrective actions, and periodic review of the procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Classification of all menu items into three process categories (no cook, same day, complex)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written documentation of the classification of all menu items	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of what will be monitored, when and how often monitoring will occur, and who will be responsible for monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Monitoring of critical control points and standard operating procedures by making direct observations or taking measurements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written documentation of the results of monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Corrective actions to take when control measures are not met	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training for employees on corrective actions to take when control measures are not met	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Documentation of corrective actions taken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of what records will be kept, where to keep them, and who will be responsible for maintaining them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ongoing as well as a periodic review of the components of the food safety program consisting of making observations, calibrating equipment/devices, reviewing records/actions, and discussing procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of who is responsible for reviewing the components of the food safety program, when the review will be done, and how it will be documented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Annual review and revision of the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Indicate whether or not the food safety programs in your district have written standard operating procedures for each of the following.

	No	Yes
Hand washing	<input type="radio"/>	<input type="radio"/>
Glove use	<input type="radio"/>	<input type="radio"/>
Personal hygiene	<input type="radio"/>	<input type="radio"/>
Employee health (restricting ill employees)	<input type="radio"/>	<input type="radio"/>
Calibrating thermometers	<input type="radio"/>	<input type="radio"/>
Purchasing	<input type="radio"/>	<input type="radio"/>
Receiving	<input type="radio"/>	<input type="radio"/>
Storing	<input type="radio"/>	<input type="radio"/>
Transporting	<input type="radio"/>	<input type="radio"/>
Holding	<input type="radio"/>	<input type="radio"/>
Preparing	<input type="radio"/>	<input type="radio"/>
Cleaning/sanitizing	<input type="radio"/>	<input type="radio"/>
Cooking	<input type="radio"/>	<input type="radio"/>
Cooling	<input type="radio"/>	<input type="radio"/>
Reheating	<input type="radio"/>	<input type="radio"/>

List any other processes for which your district's food safety programs have standard operating procedures below

Indicate whether or not the following are documented/recorded routinely in your district.

	No	Yes
Receiving temperatures	<input type="radio"/>	<input type="radio"/>
Refrigerator temperatures	<input type="radio"/>	<input type="radio"/>
End-point cooking times and temperatures	<input type="radio"/>	<input type="radio"/>
Serving temperatures	<input type="radio"/>	<input type="radio"/>
Holding equipment temperatures	<input type="radio"/>	<input type="radio"/>
Sanitation temperatures or chemical concentrations	<input type="radio"/>	<input type="radio"/>
Dishmachine temperatures	<input type="radio"/>	<input type="radio"/>
Corrective actions taken	<input type="radio"/>	<input type="radio"/>
Verification or review of records	<input type="radio"/>	<input type="radio"/>
Thermometer calibration	<input type="radio"/>	<input type="radio"/>
Training conducted	<input type="radio"/>	<input type="radio"/>

List any other items documented/recorded routinely in your district below

Director Barriers/Support

Rate the extent to which each of the following factors is a barrier to the development and implementation of food safety programs based on HACCP principles.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Lack of affordable materials/opportunities for training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of employee knowledge/skill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of familiarity with HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of available materials/opportunities for training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Equipment limitations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of understanding of benefits of food safety programs based on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time required for training employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costs of additional labor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costs required to update facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facility limitations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burden of documentation/record keeping required with a food safety program based on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of administrative support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Perception of a food safety program based on HACCP principles as creating additional work burdens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of training resources for diverse audiences (for example, materials in languages other than English)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High employee turnover	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of adequate number of employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of food safety/HACCP resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burden of overseeing the implementation of the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negative attitudes of employees toward the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time required to develop the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burden of ongoing training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of employee support/motivation to adopt the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costs required for new/additional equipment/supplies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costs associated with training on the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burden of monitoring required with a food safety program based on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Need to utilize part-time employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Perception of HACCP principles as not valuable and/or unnecessary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time required to implement the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

List any other barriers below

What support would be most helpful in developing, implementing, and/or evaluating food safety programs based on HACCP principles?

How important is each of the following in developing and implementing food safety programs based on HACCP principles?

	Very Important	Important	Somewhat Important	Not at All Important
Making food safety practices part of employee evaluation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serving as a positive role model with respect to food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing education programs to address barriers to implementing the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensuring that the food safety program is practical to apply	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Requiring new employees to complete food safety training before handling food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making available the tools, equipment, and supplies necessary to promote food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Setting a realistic timeline for implementation of the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selecting or updating equipment to support food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing tools for self-assessment of food safety programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Designing, selecting, or modifying facilities to promote food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taking disciplinary action with employees who do not follow food safety policies and procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Considering food safety program implementation an ongoing process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using signs/notices in key areas to serve as reminders of safe food handling practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensuring that all employees know their role in the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Requiring food safety certification for management and supervisory employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementing the food safety program in stages consisting of small, achievable steps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing effective supervision of employees regarding food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working with school district/administrators to develop a strong food safety policy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensuring ill employees do not work with food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training all employees on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Giving verbal reminders and praise to employees with respect to food safety tasks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gaining employee commitment to food safety and HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing ongoing food safety training for all employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensuring that the food safety program is employee-focused	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Director Knowledge/Skills

Implementation of Food Safety Programs Based on HACCP Principles in School Nutrition Programs

Rate your degree of knowledge of each of the following.

	Excellent	Good	Fair	Poor
HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to apply HACCP principles to your district food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to comply with federal regulations regarding a food safety program based on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to address food safety program deficiencies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to provide food safety training to school nutrition staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Basic principles and techniques of foodservice sanitation and food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Federal, state, and local sanitation and food safety requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Principles of foodborne illness prevention	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fundamentals of HACCP-based standard operating procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The importance of all aspects of food defense	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Principles of food biosecurity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Rate your level of skill in each of the following tasks.

	Excellent	Good	Fair	Poor
Developing a food safety program that meets federal, state, and local regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serving as a role model for following good food safety practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensuring that all food safety inspection deficiencies are addressed competently and in a timely manner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing a sanitation training program for school nutrition staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing emergency procedures and practices for food recalls and foodborne illnesses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Establishing communication procedures within the school district regarding food safety issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supervising foodservice employees in following good food safety practices and implementing a food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conducting routine food safety and sanitation inspections at each school nutrition site and developing corrective action plans, as needed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Director Resources/Training

**From which of the following sources do you get food safety information?
Check all that apply.**

- ☐ National Food Service Management Institute (NFSMI)
- ☐ United States Department of Agriculture (USDA)
- ☐ National Restaurant Association
- ☐ National Restaurant Association Educational Foundation (NRAEF)
- ☐ Centers for Disease Control and Prevention (CDC)
- ☐ United States Food and Drug Administration (FDA)
- ☐ United States Environmental Protection Agency (EPA)
- ☐ Partnership for Food Safety Education
- ☐ School Nutrition Association
- ☐ State or local health department
- ☐ State agency
- ☐ Federal or state food codes
- ☐ State Cooperative Extension Service
- ☐ University food science/nutrition departments
- ☐ Commercial foodservice management, food, or equipment companies
- ☐ ServSafe®
- ☐ Serving It Safe
- ☐ Food Handler's program
- ☐ Other (please specify below)

Do you require food safety certification for managers in your district?

- ☐ No
- ☐ Yes

Which of the following do you use to provide basic food safety training for managers in your district? Check all that apply.

- ☐ ServSafe®
- ☐ Serving It Safe
- ☐ Food Handler's program
- ☐ Other (please specify below)

In which of the following formats do you prefer to receive YOUR information/training related to food safety? Check all that apply.

- ☐ Printed information/materials
- ☐ CD or disk containing information/materials
- ☐ Information/materials downloaded from Web site
- ☐ Web-based courses
- ☐ Webinars (web-based seminars)
- ☐ In-person training (seminars, workshops, inservice training)
- ☐ Video/DVD training
- ☐ PowerPoint presentations/slides
- ☐ Consultation with an external expert/mentor
- ☐ State or national conferences or meetings
- ☐ Professional books, journals, and/or magazines
- ☐ Other (please specify below)

Which of the following formats do you use to provide information/training related to food safety TO EMPLOYEES? Check all that apply.

- ☐ Printed information/materials
- ☐ CD or disk containing information/materials
- ☐ Information/materials downloaded from Web site
- ☐ Web-based courses
- ☐ Webinars (web-based seminars)
- ☐ In-person training (seminars, workshops, inservice training)
- ☐ Video/DVD training
- ☐ PowerPoint presentations/slides
- ☐ Consultation with an external expert/mentor
- ☐ State or national conferences or meetings
- ☐ Professional books, journals, and/or magazines
- ☐ Other (please specify below)

Rate your level of agreement that each of the following resources would be helpful in developing and/or implementing food safety programs based on HACCP principles.

	Strongly Agree	Agree	Disagree	Strongly Disagree
"Developing a School Food Safety Program" (USDA and NFSMI)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training programs from NFSMI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resources from NFSMI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from national/professional organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from state agency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from school district	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from state or local health department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from university and/or Cooperative Extension Service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from ServSafe®, Serving It Safe, and/or Food Handler's program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from commercial foodservice management, food, and/or equipment companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from an external consultant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sample food safety programs based on HACCP principles designed for school foodservice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sample standard operating procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sample documentation/record forms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Standardized recipes with critical control points and critical limits identified	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-assessment tools to use for internal program reviews	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mentoring by more experienced directors/managers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Case study examples of implementation of food safety programs based on HACCP principles in other districts/schools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
List any other resources that would be helpful below				

Which of the following resources has your district used in developing and/or implementing a food safety program based on HACCP principles? Check all that apply.

- ☐ "Developing a School Food Safety Program" (USDA and NFSMI)
- ☐ Training programs from NFSMI
- ☐ Resources from NFSMI
- ☐ Training/resources from national/professional organization
- ☐ Training/resources from state agency
- ☐ Training/resources from school district
- ☐ Training/resources from state or local health department
- ☐ Training/resources from university and/or Cooperative Extension Service
- ☐ Training/resources from ServSafe®, Serving It Safe, and/or Food Handler's program
- ☐ Training/resources from commercial foodservice management, food, and/or equipment companies
- ☐ Training/resources from an external consultant
- ☐ Sample food safety programs based on HACCP principles designed for school foodservice
- ☐ Sample standard operating procedures
- ☐ Sample documentation/record forms
- ☐ Standardized recipes with critical control points and critical limits identified
- ☐ Self-assessment tools to use for internal program reviews
- ☐ Mentoring by more experienced directors/managers
- ☐ Case study examples of implementation of food safety programs based on HACCP principles in other districts/schools

List any other resources utilized below

Director Personal/Program

What are your certifications/credentials? Check all that apply.

- ☐ Not certified/credentialed
- ☐ State Department of Education certified
- ☐ School Nutrition Association certified
- ☐ ServSafe® certified
- ☐ Registered Dietitian
- ☐ Dietetic Technician, Registered
- ☐ Licensed Dietitian/Nutritionist
- ☐ School Nutrition Specialist
- ☐ Certified Dietary Manager
- ☐ Other (please specify below)

How many years have you worked in school nutrition programs?

- ☐ Less than 1 year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ Greater than 20 years

How many years have you been in your current position?

- ☐ Less than 1 year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ Greater than 20 years

What is your age?

- ☐ Less than 20 years
- ☐ 20-29 years
- ☐ 30-39 years
- ☐ 40-49 years
- ☐ 50 years or greater

What is your sex?

- ☐ Female
- ☐ Male

What is the highest level of education you have completed?

- ☐ Less than high school diploma
- ☐ High school diploma or GED
- ☐ Some college
- ☐ Associate or two year degree
- ☐ Bachelor's degree
- ☐ Some graduate work
- ☐ Master's degree
- ☐ Doctorate degree

In what USDA region do you work?

- ☐ Western Region – AK, AZ, CA, GU, HI, ID, NV, OR, WA
- ☐ Mountain Plains – CO, IA, KS, MO, MT, ND, NE, SD, UT, WY
- ☐ Midwest – IL, IN, MI, MN, OH, WI
- ☐ Northeast – CT, MA, ME, NH, NY, RI, VT
- ☐ Mid-Atlantic – DC, DE, MD, NJ, PA, PR, VA, VI, WV
- ☐ Southeast – AL, FL, GA, KY, MS, NC, SC, TN
- ☐ Southwest – AR, LA, NM, OK, TX

Is there a formal food safety team in your district or school?

- ☐ No
- ☐ Yes, district food safety team
- ☐ Yes, school food safety team

Do schools in your district receive a minimum of two health department inspections each year?

- ☐ No
☐ Yes

What type of food production systems are used in your district? Check all that apply.

- ☐ Conventional on-site—food is cooked and served at same location
☐ Central Kitchen—food is distributed to other serving sites
☐ Base Kitchen—food is cooked and served on site and food is distributed to other sites for service
☐ Satellite (Receiving) Kitchen—food is received from another kitchen for service at this site

What is the total enrollment in your school district?

- ☐ 2,799 or less
☐ 2,800-29,999
☐ 30,000 or greater

Manager Implementation

Does your school have written standard operating procedures for food safety?

- ☐ No
☐ Yes

Has your school implemented a food safety program based on Hazard Analysis and Critical Control Point (HACCP) principles?

- ☐ No
☐ Yes
☐ I don't know/I am not familiar with the requirement for a food safety program.

*** Which of the following best describes the development and implementation status of a food safety program based on HACCP principles in your school?**

- ☐ My school has not begun to develop a food safety program based on HACCP principles.
- ☐ My school is in the process of developing a food safety program based on HACCP principles.
- ☐ My school has developed a food safety program based on HACCP principles, but has not begun implementation of the program.
- ☐ My school is in the process of implementing a food safety program based on HACCP principles.
- ☐ My school has completely implemented a food safety program based on HACCP principles.

Manager Follow-up 1

When did your school implement a food safety program based on HACCP principles?

- ☐ Prior to the 2005-2006 school year
- ☐ During the 2005-2006 school year
- ☐ During the 2006-2007 school year
- ☐ During the 2007-2008 school year
- ☐ During the 2008-2009 school year
- ☐ During the 2009-2010 school year

Manager Follow-up 2

What was the motivation for developing and/or implementing a food safety program based on HACCP principles in your school? Check all that apply.

- ☐ Improvement in safety of foods served
- ☐ Previous incident of foodborne illness in district/school
- ☐ Awareness of risk/consequences of foodborne illness
- ☐ Way to reduce liability
- ☐ Way to save time
- ☐ Way to save money
- ☐ Awareness of HACCP as the best approach to food safety
- ☐ Requirement of state agency overseeing school nutrition programs
- ☐ Requirement of federal law
- ☐ Other (please specify below)

Manager Components

How important is each of the following in a food safety program?

	Very Important	Important	Somewhat Important	Not At All Important
Standard operating procedures (written step-by-step instructions) for foodservice tasks that affect the safety of food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Standard operating procedures that include instructions on monitoring, documentation, corrective actions, and periodic review of the procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Classification of all menu items into three process categories (no cook, same day, complex)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written documentation of the classification of all menu items	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of what will be monitored, when and how often monitoring will occur, and who will be responsible for monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Monitoring of critical control points and standard operating procedures by making direct observations or taking measurements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written documentation of the results of monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Corrective actions to take when control measures are not met	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training for employees on corrective actions to take when control measures are not met	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Documentation of corrective actions taken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of what records will be kept, where to keep them, and who will be responsible for maintaining them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ongoing as well as a periodic review of the components of the food safety program consisting of making observations, calibrating equipment/devices, reviewing records/actions, and discussing procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of who is responsible for reviewing the components of the food safety program, when the review will be done, and how it will be documented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Annual review and revision of the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Has your school implemented the following food safety program components?

	No	Yes	In Progress
Standard operating procedures (written step-by-step instructions) for foodservice tasks that affect the safety of food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Standard operating procedures that include instructions on monitoring, documentation, corrective actions, and periodic review of the procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Classification of all menu items into three process categories (no cook, same day, complex)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written documentation of the classification of all menu items	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of what will be monitored, when and how often monitoring will occur, and who will be responsible for monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Monitoring of critical control points and standard operating procedures by making direct observations or taking measurements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written documentation of the results of monitoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Corrective actions to take when control measures are not met	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training for employees on corrective actions to take when control measures are not met	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Documentation of corrective actions taken	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of what records will be kept, where to keep them, and who will be responsible for maintaining them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ongoing as well as a periodic review of the components of the food safety program consisting of making observations, calibrating equipment/devices, reviewing records/actions, and discussing procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Determination of who is responsible for reviewing the components of the food safety program, when the review will be done, and how it will be documented	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Annual review and revision of the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Indicate whether or not the food safety program in your school has written standard operating procedures for each of the following.

	No	Yes
Hand washing	<input type="radio"/>	<input type="radio"/>
Glove use	<input type="radio"/>	<input type="radio"/>
Personal hygiene	<input type="radio"/>	<input type="radio"/>
Employee health (restricting ill employees)	<input type="radio"/>	<input type="radio"/>
Calibrating thermometers	<input type="radio"/>	<input type="radio"/>
Purchasing	<input type="radio"/>	<input type="radio"/>
Receiving	<input type="radio"/>	<input type="radio"/>
Storing	<input type="radio"/>	<input type="radio"/>
Transporting	<input type="radio"/>	<input type="radio"/>
Holding	<input type="radio"/>	<input type="radio"/>
Preparing	<input type="radio"/>	<input type="radio"/>
Cleaning/sanitizing	<input type="radio"/>	<input type="radio"/>
Cooking	<input type="radio"/>	<input type="radio"/>
Cooling	<input type="radio"/>	<input type="radio"/>
Reheating	<input type="radio"/>	<input type="radio"/>

List any other processes for which your school's food safety program has standard operating procedures below

Indicate whether or not the following are documented/recorded routinely in your school.

	No	Yes
Receiving temperatures	<input type="radio"/>	<input type="radio"/>
Refrigerator temperatures	<input type="radio"/>	<input type="radio"/>
End-point cooking times and temperatures	<input type="radio"/>	<input type="radio"/>
Serving temperatures	<input type="radio"/>	<input type="radio"/>
Holding equipment temperatures	<input type="radio"/>	<input type="radio"/>
Sanitation temperatures or chemical concentrations	<input type="radio"/>	<input type="radio"/>
Dishmachine temperatures	<input type="radio"/>	<input type="radio"/>
Corrective actions taken	<input type="radio"/>	<input type="radio"/>
Verification or review of records	<input type="radio"/>	<input type="radio"/>
Thermometer calibration	<input type="radio"/>	<input type="radio"/>
Training conducted	<input type="radio"/>	<input type="radio"/>

List any other items documented/recorded routinely in your school below

Manager Barriers/Support

Rate the extent to which each of the following factors is a barrier to the development and implementation of a food safety program based on HACCP principles.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Costs required to update facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of available materials/opportunities for training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time required for training employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High employee turnover	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burden of overseeing the implementation of the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of administrative support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of familiarity with HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of understanding of benefits of food safety programs based on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Perception of HACCP principles as not valuable and/or unnecessary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of employee support/motivation to adopt the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of food safety/HACCP resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of training resources for diverse audiences (for example, materials in languages other than English)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facility limitations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of affordable materials/opportunities for training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of employee knowledge/skill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burden of documentation/record keeping required with a food safety program based on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time required to implement the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of adequate number of employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Negative attitudes of employees toward the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costs of additional labor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Time required to develop the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costs associated with training on the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Perception of a food safety program based on HACCP principles as creating additional work burdens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Costs required for new/additional equipment/supplies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Equipment limitations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burden of ongoing training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Need to utilize part-time employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Burden of monitoring required with a food safety program based on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
List any other barriers below	<input type="text"/>			

What support would be most helpful in developing, implementing, and/or evaluating a food safety program based on HACCP principles?

How important is each of the following in developing and implementing a food safety program based on HACCP principles?

	Very Important	Important	Somewhat Important	Not at All Important
Ensuring that all employees know their role in the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing ongoing food safety training for all employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Requiring food safety certification for management and supervisory employees	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making available the tools, equipment, and supplies necessary to promote food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Giving verbal reminders and praise to employees with respect to food safety tasks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Working with school district/administrators to develop a strong food safety policy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing education programs to address barriers to implementing the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using signs/notices in key areas to serve as reminders of safe food handling practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Setting a realistic timeline for implementation of the food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensuring ill employees do not work with food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serving as a positive role model with respect to food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Designing, selecting, or modifying facilities to promote food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing tools for self-assessment of food safety programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Taking disciplinary action with employees who do not follow food safety policies and procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Making food safety practices part of employee evaluation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensuring that the food safety program is practical to apply	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensuring that the food safety program is employee-focused	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing effective supervision of employees regarding food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Considering food safety program implementation an ongoing process	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementing the food safety program in stages consisting of small, achievable steps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training all employees on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gaining employee commitment to food safety and HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Selecting or updating equipment to support food safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Requiring new employees to complete food safety training before handling food	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Manager Knowledge/Skills

Implementation of Food Safety Programs Based on HACCP Principles
in School Nutrition Programs

Rate your degree of knowledge of each of the following.

	Excellent	Good	Fair	Poor
HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to apply HACCP principles to your school food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to comply with federal regulations regarding a food safety program based on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to address food safety program deficiencies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How to provide food safety training to school nutrition staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
State and local code requirements for foodservice establishments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Basic principles of foodservice sanitation for equipment, personnel, food, and facility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Appropriate control techniques for insect and rodent contamination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Causes of foodborne illnesses and infections, their characteristics, and the most commonly infected foods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Procedures to follow that prevent foodborne illness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Principles of personal hygiene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Principles of a food safety program based on HACCP principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Techniques for keeping food secure when in storage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Importance of school district maintaining a food safety policy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Methods for training staff on safe food handling techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Importance of verifying safety and security of food items received from vendors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sources of food safety information for the school nutrition program operation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Implementation of Food Safety Programs Based on HACCP Principles
in School Nutrition Programs

Rate your level of skill in each of the following tasks.

	Excellent	Good	Fair	Poor
Implementing a system to protect food at all times from contamination agents such as unclean equipment and utensils, pests and rodents, unnecessary handling, poor hygiene habits, and inadequate sanitary facilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementing a schedule for thoroughly cleaning and sanitizing all utensils, equipment, food preparation areas, counters, walls, and floors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementing and maintaining a practice of handling clean and sanitized equipment and utensils to protect them from contamination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementing principles of sanitary food handling using HACCP or other appropriate systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Observing rules of time and temperature relationships for food handling and preparation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementing proper food handling techniques to prevent foodborne illness	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensuring process for maintaining food at the proper temperature at all times during freezing, thawing, preparing, holding, and serving	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementing rules of safe practice for handling or discarding leftover foods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining daily temperature records of the dry storage areas, refrigeration equipment, and dishwashing equipment, noting deficiencies and corrections	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enforcing rules of health, cleanliness, personal habits, and proper clothing to ensure clean and healthy food handlers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planning a system to display and serve food safely that includes sneeze-guards and length of time food is on display	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementing a system for receiving and storage of food that uses good housekeeping procedures to reduce the potential for insect and rodent infestation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Implementing a system of properly using, cleaning, and disinfecting approved garbage and trash receptacles and area regularly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Correcting foodservice deficiencies noted on sanitation inspection reports by Public Health Department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintaining a copy of state and local health regulations at the school site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evaluating pest control products and services for effectiveness when they are approved for use in the school's foodservice department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Establishing checklist procedures for inspecting products upon delivery with regard to safety and sanitation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Calibrating food thermometers regularly to ensure accuracy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Providing food safety training for staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Applying district or local guidelines to reduction and recycling of waste and other discarded products	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Serving as a role model for following good food safety practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supervising foodservice employees in following good food safety practices and implementing a food safety program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Manager Resources/Training

From which of the following sources do you get food safety information?

Check all that apply.

- ☐ National Food Service Management Institute (NFSMI)
- ☐ United States Department of Agriculture (USDA)
- ☐ National Restaurant Association
- ☐ National Restaurant Association Educational Foundation (NRAEF)
- ☐ Centers for Disease Control and Prevention (CDC)
- ☐ United States Food and Drug Administration (FDA)
- ☐ United States Environmental Protection Agency (EPA)
- ☐ Partnership for Food Safety Education
- ☐ School Nutrition Association
- ☐ State or local health department
- ☐ State agency
- ☐ Federal or state food codes
- ☐ State Cooperative Extension Service
- ☐ University food science/nutrition departments
- ☐ Commercial foodservice management, food, or equipment companies
- ☐ ServSafe®
- ☐ Serving It Safe
- ☐ Food Handler's program
- ☐ Other (please specify below)

Do you require food safety certification for employees in your school?

- ☐ No
- ☐ Yes

Which of the following do you use to provide basic food safety training for employees in your school? Check all that apply.

- ☐ ServSafe®
- ☐ Serving It Safe
- ☐ Food Handler's program
- ☐ Other (please specify below)

In which of the following formats do you prefer to receive YOUR information/training related to food safety? Check all that apply.

- ☐ Printed information/materials
- ☐ CD or disk containing information/materials
- ☐ Information/materials downloaded from Web site
- ☐ Web-based courses
- ☐ Webinars (web-based seminars)
- ☐ In-person training (seminars, workshops, inservice training)
- ☐ Video/DVD training
- ☐ PowerPoint presentations/slides
- ☐ Consultation with an external expert/mentor
- ☐ State or national conferences or meetings
- ☐ Professional books, journals, and/or magazines
- ☐ Other (please specify below)

Which of the following formats do you use to provide information/training related to food safety TO EMPLOYEES? Check all that apply.

- ☐ Printed information/materials
- ☐ CD or disk containing information/materials
- ☐ Information/materials downloaded from Web site
- ☐ Web-based courses
- ☐ Webinars (web-based seminars)
- ☐ In-person training (seminars, workshops, inservice training)
- ☐ Video/DVD training
- ☐ PowerPoint presentations/slides
- ☐ Consultation with an external expert/mentor
- ☐ State or national conferences or meetings
- ☐ Professional books, journals, and/or magazines
- ☐ Other (please specify below)

Rate your level of agreement that each of the following resources would be helpful in developing and/or implementing a food safety program based on HACCP principles.

	Strongly Agree	Agree	Disagree	Strongly Disagree
"Developing a School Food Safety Program" (USDA and NFSMI)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training programs from NFSMI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Resources from NFSMI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from national/professional organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from state agency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from school district	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from state or local health department	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from university and/or Cooperative Extension Service	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from ServSafe®, Serving It Safe, and/or Food Handler's program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from commercial foodservice management, food, and/or equipment companies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Training/resources from an external consultant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sample food safety programs based on HACCP principles designed for school foodservice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sample standard operating procedures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sample documentation/record forms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Standardized recipes with critical control points and critical limits identified	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-assessment tools to use for internal program reviews	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mentoring by more experienced directors/managers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Case study examples of implementation of food safety programs based on HACCP principles in other districts/schools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
List any other resources that would be helpful below				

Which of the following resources has your school used in developing and/or implementing a food safety program based on HACCP principles? Check all that apply.

- ☐ "Developing a School Food Safety Program" (USDA and NFSMI)
- ☐ Training programs from NFSMI
- ☐ Resources from NFSMI
- ☐ Training/resources from national/professional organization
- ☐ Training/resources from state agency
- ☐ Training/resources from school district
- ☐ Training/resources from state or local health department
- ☐ Training/resources from university and/or Cooperative Extension Service
- ☐ Training/resources from ServSafe®, Serving It Safe, and/or Food Handler's program
- ☐ Training/resources from commercial foodservice management, food, and/or equipment companies
- ☐ Training/resources from an external consultant
- ☐ Sample food safety programs based on HACCP principles designed for school foodservice
- ☐ Sample standard operating procedures
- ☐ Sample documentation/record forms
- ☐ Standardized recipes with critical control points and critical limits identified
- ☐ Self-assessment tools to use for internal program reviews
- ☐ Mentoring by more experienced directors/managers
- ☐ Case study examples of implementation of food safety programs based on HACCP principles in other districts/schools

List any other resources utilized below

Manager Personal/Program

What are your certifications/credentials? Check all that apply.

- ☐ Not certified/credentialed
- ☐ State Department of Education certified
- ☐ School Nutrition Association certified
- ☐ ServSafe® certified
- ☐ Registered Dietitian
- ☐ Dietetic Technician, Registered
- ☐ Licensed Dietitian/Nutritionist
- ☐ School Nutrition Specialist
- ☐ Certified Dietary Manager
- ☐ Other (please specify below)

How many years have you worked in school nutrition programs?

- ☐ Less than 1 year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ Greater than 20 years

How many years have you been in your current position?

- ☐ Less than 1 year
- ☐ 1-5 years
- ☐ 6-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ Greater than 20 years

What is your age?

- ☐ Less than 20 years
- ☐ 20-29 years
- ☐ 30-39 years
- ☐ 40-49 years
- ☐ 50 years or greater

What is your sex?

- ☐ Female
- ☐ Male

What is the highest level of education you have completed?

- ☐ Less than high school diploma
- ☐ High school diploma or GED
- ☐ Some college
- ☐ Associate or two year degree
- ☐ Bachelor's degree
- ☐ Some graduate work
- ☐ Master's degree
- ☐ Doctorate degree

In what USDA region do you work?

- ☐ Western Region – AK, AZ, CA, GU, HI, ID, NV, OR, WA
- ☐ Mountain Plains – CO, IA, KS, MO, MT, ND, NE, SD, UT, WY
- ☐ Midwest – IL, IN, MI, MN, OH, WI
- ☐ Northeast – CT, MA, ME, NH, NY, RI, VT
- ☐ Mid-Atlantic – DC, DE, MD, NJ, PA, PR, VA, VI, WV
- ☐ Southeast – AL, FL, GA, KY, MS, NC, SC, TN
- ☐ Southwest – AR, LA, NM, OK, TX

Is there a formal food safety team in your district or school?

- ☐ No
- ☐ Yes, district food safety team
- ☐ Yes, school food safety team

Does your school receive a minimum of two health department inspections each year?

- ☐ No
- ☐ Yes

What type of food production system is used in your school?

- ☐ Conventional on-site—food is cooked and served at same location
- ☐ Central Kitchen—food is distributed to other serving sites
- ☐ Base Kitchen—food is cooked and served on site and food is distributed to other sites for service
- ☐ Satellite (Receiving) Kitchen—food is received from another kitchen for service at this site

What is the total enrollment in your school?

- ☐ Less than 300
- ☐ 300-599
- ☐ 600-899
- ☐ 900 or greater

What is the average number of lunches served to students per day in your school?

- ☐ Less than 300
- ☐ 300-399
- ☐ 400-499
- ☐ 500-599
- ☐ 600-699
- ☐ 700-799
- ☐ 800-899
- ☐ 900-999
- ☐ 1000 or greater

Ending Page

Click the "Done" button below to submit your survey.

Thank you for your participation - it is greatly appreciated!



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