2012

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Implementation of school districts’ food safety plans and perceptions of support for food safety and training in child nutrition programs in one USDA region

by

Cynthia A. Dawso Van Druff

A dissertation submitted to the graduate faculty in partial fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY

Major: Hospitality Management

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Iowa State University
Ames, Iowa
2012

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ACKNOWLEDGMENTS

I believe in setting goals. My latest goal was to earn a doctoral degree. I also believe that successfully completing a goal requires perseverance. And, oh did I persevere.

To that end I gratefully dedicate this degree to and thank my family, professors, co-workers, Iowa State classmates and friends.

To my husband, Robert, a special thank you for his love and steadfast encouragement. To my mother, Della Dawso, who all my life, with love, supported me in all my endeavors and could always be counted on, no matter what path I chose. To my sister, Ginger Hartman, for her continued “cheering me on” and taking care of every holiday detail and understanding when I was not able to share holiday time with our family. To my cousin, Patricia Durler, for the endless phone calls to districts to obtain address contacts and taking care of so many necessary details and to Beth and Roger Hanna for their unwavering support and endless hospitality.

My gratitude goes to Dr. Mary Gregoire and Dr. Jeannie Sneed for their vision to create the Child Nutrition Leadership Academy at Iowa State University. A heartfelt thanks to Dr. Catherine Strohbehn, my major professor, for her continual guidance, support, reassurance, and endless ability to clarify and read and re-read. I wish to thank my committee, Dr. Susan W. Arendt, Dr. Robert Bosselman, Dr. Angela Laury, Dr. Mack Shelley and Dr. Catherine Strohbehn for their support and encouragement.

As I close this latest chapter in my educational journey, who knows what path will beckon.
ABSTRACT

School foodservice directors (FSDs) and school business officials (SBOs) in public school districts with enrollments between 2,500 and 25,000 in the USDA Mid-Atlantic geographic region provided responses to a paper-and-pencil survey. The FSDs assessed the level of implementation of a mandated school food safety plan in their districts and perceived administrative support and also identified the district’s food safety training efforts. These findings were compared with SBOs identified knowledge and levels of support for the district’s child nutrition program. These variables along with FSD and SBO demographic data and district characteristics were analyzed to determine if significant differences existed in their perceptions.

Responses were received from one third of the sample of Mid-Atlantic region districts’ (N = 498) FSDs (n = 166) and a little less than 20% of the SBOs (n = 91). Study results found half of the FSDs and one third of SBOs identified the existence of a board-level district policy about food safety. Both groups rated highly the importance of such a policy, with means greater than 4.0 (FSDs, M = 4.37; SBOs, M = 4.176) on a 5-point scale ranging from 1 (very unimportant) to 5 (very important). The FSDs placed more importance on the need for policies to address foods from home than did SBOs, yet there were no significant differences in the perceptions of either FSDs or SBOs about the importance of district food safety policies from all respondents or between FSDs and SBOs from the same district.

The FSDs reported food safety plans as fairly complete (M = 4.67) based on the presence of written standard operating procedures (SOPs) addressing specific items and recordkeeping documentation. However, less than one third of respondents documented the
use of prerequisite programs. The majority did indicate compliance with semiannual inspections and posting of inspection reports.

Close to half of the SBOs in the Mid-Atlantic region were unfamiliar with or not knowledgeable about the food safety component of the Reauthorization Act of 2004. Those SBOs with knowledge of the mandate reported learning of the requirements of the legislation through the school FSD, state agency, or other SBOs.

Foodservice directors reported district administration was generally supportive for training but neutral on the importance of training for foodservice staff and offered minimal financial support for such training. FSDs and SBOs both identified most frequently that a state or federal agency mandate for requirement of food safety training would positively influence district administrative support and funding for this purpose.

Findings from this study suggest greater need for the adoption of district board-level policies relating to safety of all foods served on school grounds, regardless of preparation location. This study also showed a need for districts to develop and adopt SOPs to guide procedures for food preparation, service, and sales district-wide and to provide training for the FSD and all school staff about food safety and changes in child nutrition program regulations.

Several limitations were identified in this study including reliance on self-reported data and possible misrepresentation from the population, the local district’s policy on survey participation, and method of distribution and collection of the paper survey. Recommendations for future studies include assessing the effectiveness of an educational module about child nutrition programs and food safety as a component of school administrator licensing or certification programs and effectiveness of child nutrition
programs as related to funded and unfunded mandates recommended in the Healthy, Hunger-Free Kids Act of 2010.
CHAPTER 1. INTRODUCTION

Introduction

The Richard B. Russell National School Lunch Act (NSLA) of 1946, established under Public Law 79-396, provided a foundation for the development of a strong national child nutrition policy and established the National School Lunch Program (NSLP) on a permanent basis (J. Martin, 1999a). The intent was declared to be the policy of Congress as a measure of national security, to safeguard the health and well-being of the nation’s children, and to encourage domestic consumption of nutritious agricultural commodities by assisting states in providing nonprofit school lunch programs (J. Martin, 1999a). The School Nutrition Association ([SNA], 2011b) estimated that the NSLP operated in more than 101,000 public and nonprofit private schools and resident child care institutions in fiscal year 2010, with more than 31.6 million children served each school day. During the 2010 fiscal year, a total of 5.2 billion lunches were served with support from the United States Department of Agriculture (USDA) of $10.0 billion (USDA, Economic Research Service [USDA-ERS], 2011). During the 2010 fiscal year, an estimated 11.6 million breakfast meals were served daily (USDA, 2011c; USDA-ERS 2011) in 88,000 school and childcare settings (SNA, 2011b).

USDA administers the following domestic food assistance programs: NSLP, School Breakfast Program (SBP), After-School Snack Program, Summer Food Service Program, and Child and Adult Care Food Program. Other key nutrition assistance programs are the Special Milk Program, Special Supplemental Food Program for Women, Infants, and Children (WIC), Fresh Fruit and Vegetable Program, and Supplemental Nutrition Assistance Program (formerly Food Stamps). The SBP was established as a 2-year pilot project designed to assist
schools serving breakfast to “nutritional needy” children (USDA, 2011d) under the Child Nutrition Act of 1966. After many modifications the project received permanent authorization (J. Martin, 1999b; SNA, 2008). The SBP was designed to ensure that all children are ready to learn and have access to a healthy breakfast at school (SNA, 2008). After-school snacks were offered by an estimated 47% of school foodservice operations (SNA, 2008). In 2009, over 214 million snacks were provided after school (USDA-ERS, 2011). In 1968, the special foodservice program was created as a 3-year pilot. This pilot had two sections: child care and summer program. In 1975, the two sections separated and were renamed the Summer Food Service Program under Section 13 of the NSLA and the Child Nutrition Act of 1966 and Child and Adult Care Food Program (J. Martin, 1999b). The Child and Adult Care Food Program began as a children-only pilot (SNA, 2008) in 1968 and was permanently authorized under Section 17 of the NSLA of 1946 in 1975 (J. Martin, 1999b). The Child and Adult Care Food Program serves breakfasts, lunches, suppers, and snacks to children residing in shelters, licensed childcare facilities, homes and also to disabled elderly persons in adult day-care facilities (J. Martin, 1999b; SNA, 2008). The program was expanded to include adults in 1987. Close to 2.2 million children were served meals at 34,752 sites during the summer of 2009 (USDA-ERS, 2011). The Special Milk Program initially began in 1954 and operated on a year-to-year basis until permanent authorization by the Child Nutrition Act of 1966. Close to 6,000 schools, camps, and residential program participated in the SMP (USDA, 2011e). The Farm Security and Rural Investment Act of 2002 authorized the pilot and the Food, Conservation, and Energy Act of 2008 expanded the Fresh Fruit and Vegetable Program. The USDA has estimated about one
in five Americans participates in at least one food assistance program during a given year (USDA, 2007c, 2008b).

Public Law 108-265, section 111 of the Child Nutrition and WIC Reauthorization Act of 2004 amended section 9(h) of the NSLA and required school food authorities and local educational agencies to implement a food safety plan for the start of the 2005–2006 school year in each school building in districts participating in the NSLP and/or SBP (USDA, 2005). “The program must be based on Hazard Analysis and Critical Control Point principles (HACCP) and conform to guidance issued by the United States Department of Agriculture” (USDA, Food and Nutrition Service [USDA-FNS], 2005a, p. 4). With enactment of this law, school meal programs became the first retail sector of the foodservice industry required to implement a food safety plan based on the HACCP process. Guidance was released by the USDA July, 2005, and the implementation date was extended to July 1, 2006 (USDA-FNS, 2005a). The systematic HACCP-based approach to food safety was recommended by the USDA. Congress responded to increasing food safety concerns by enacting the new food safety requirements (Almanza & Sneed, 2003; Sneed & Henroid, 2007).

**Food Safety**

Foodborne illness is a major concern to the foodservice industry. Foodborne illness is carried or transferred to people by food (National Restaurant Association Educational Foundation [NRAEF], 2008). In 2010, the Centers for Disease Control and Prevention (CDC) released new estimates of foodborne illness outbreaks in the United States. Each year, an estimated 9.4 million illnesses, 55,961 hospitalizations, and 1,351 deaths result from consumption of foods contaminated with known disease agents (Scallan, Griffin, Angulo, Tauxe, & Hoestra, 2011, Scallan, Hoekstra, et al., 2011) with an additional 38.4 million
illnesses, 71,878 hospitalizations, and 1,686 deaths estimated from consumption of foods contaminated with unspecified agents.

Anyone is at risk to develop a foodborne illness, but those at higher risk include the elderly, young children, pregnant women, transplant recipients, and the immunocompromised, because immune systems are either not fully developed or are compromised by a weakened condition. A single outbreak can affect many people. The food industry is regulated to ensure a safe food supply; however, there is some degree of risk. All foods must be grown, handled, packed, prepared, stored, and served properly to ensure food remains safe for consumption.

**Schools and Food Safety**

Preventing foodborne illness is an important concern in school settings because outbreaks have personal, academic, financial, and legal consequences for each school district (Marx, 2008). Student absenteeism affects a student’s performance in school, and if a foodborne illness outbreak occurred, school districts could experience increased insurance costs, attorney fees, and loss of revenues due to decreased participation in school meals (Marx, 2008).

Children are an at-risk population and can contract foodborne illness from eating or drinking a contaminated substance. In a 10-year study conducted between 1990 and 1999 by the U.S. General Accounting Office ([GAO], 2003), 3% of foodborne illness outbreaks occurred in schools. Daniels et al. (2002) studied the outbreaks that occurred in the period between January 1973 and December 1997 and found there were 604 school-related outbreaks reported to the CDC from state and local health departments. The commonly implicated food vehicles were poultry (18.6%), salad (6%), Mexican-style food (6%), beef
(5.7%), and dairy, not including ice cream (5.1%). The commonly reported food practices contributing to the school-related outbreaks were improper food storage, food contaminated by a food handler, and improper holding temperatures (Daniels et al., 2002). Other improper behaviors noted during observational research and survey studies were poor handwashing (Henroid & Sneed, 2004), lack of hair restraints (Giampaoli, Cluskey, & Sneed, 2002; Gilmore, Brown, & Dana, 1998), lack of calibration of thermometers (Henroid & Sneed, 2004), improper reheating (Kim & Shanklin, 1999), inappropriate sanitizing, improper heating and cooling (Henroid & Sneed, 2004), and consumption of food in a preparation area (Giampaoli, Cluskey, et al., 2002). In general, these studies found proper food-handling practices in schools were not being followed consistently.

Prior to the requirement for HACCP implementation, there was evidence that school foodservice administrators were aware of the need for food safety plans. In different state and national studies conducted prior to the food safety HACCP policy mandates, foodservice managers in one study and directors in others were asked their familiarity of knowledge of HACCP and frequency of policies in place. Hwang, Almanza, and Nelson (2001) conducted a study among school foodservice managers in Indiana schools to identify factors related to HACCP implementation. The majority of the responding managers (n = 107, 66.5%) indicated they were familiar with HACCP, yet of those, only 22 school operations had a HACCP program in place, although 30 respondents (45%) indicated they were interested or would be implementing HACCP in the near future. Youn and Sneed (2002) found that 22% of foodservice directors (FSDs) in Iowa were familiar with HACCP. Giampaoli, Cluskey, et al. (2002) found in a national study that 30% of school FSDs reported to have implemented HACCP. Of the 445 schools contacted in the 2006 School Health Policy and Program Study,
71.4% of the schools had written HACCP-based plans (O’Toole, Anderson, Miller, & Guthrie, 2007). Thus, the HACCP mandate did appear to result in plan development. In another study, the SNA (2008) found that, after the USDA mandate, 85% of schools reported HACCP implementation.

School foodservice operations use a variety of food production systems, such as conventional onsite, commissary, satellite, cook–chill, and base kitchens (Unklesbay et al., 1977). Nettles and Gregoire (2000) identified that school districts with enrollments of less than 8,500 primarily had conventional onsite kitchens (69.6%) or conventional base kitchens (54%). The majority of school districts with enrollments greater than 8,500 had conventional onsite kitchens (31%) or conventional base kitchens (45%). There has been a trend for school districts to change production systems to central production as a way to streamline operations and to combat budget constraints. As these changes occur, facilities and equipment items need to be adequate to ensure proper temperature holding and controls for products during transportation to service sites (Almanza & Sneed, 2003).

The Food Safety Assurance Pyramid (R. Gravani, personal communication, July 27, 2008) comprises three overarching areas: prerequisite programs, on-going employee training, and total management commitment. This is the foundation of support not only for the pyramid but for the success of the HACCP program. Commitment and support from management and administration are critical; without this support the HACCP program may not work in school operations (National Advisory Committee on Microbiological Criteria for Foods [NACMCF], 1998).
Training

Training has three key elements: presentation, feedback, and application as defined by the National Restaurant Association Educational Foundation ([NRAEF], 2008). Training sessions targeted to adult learners should include why the training is important, how to perform tasks, and the ability to demonstrate and practice tasks, and should receive feedback (Oakley, 1999). Presentation is the delivery of the content: feedback covers immediate reinforcement during the practice time or the application. Once the content is presented, the learner must have the opportunity to practice, perform tasks, and apply the skills. The NRAEF (2008) suggested two-thirds of the training time be devoted to application of skills and practice with feedback.

Oakley (1999) noted training of staff leads to greater job satisfaction, builds program loyalty, and maybe to lower turnover and decreased absenteeism. Staff development and professional training benefits the employee through improved morale and the employer by increasing productivity (Smith & Mazin, 2004). Smith and Mazin (2004) also noted in a survey conducted by Fortune magazine that the best 100 companies to work for reported annual training per employee ranged from 5 to 162 hours. This training was company sponsored and supported. Pannell-Martin (1999) stated the school district “owes it to employees” (p. 127) to provide training opportunities for personal development. During the 2006 School Health Policy and Program Study, 96.3% of the districts surveyed nationally provided some funding for staff development (O’Toole et al., 2007). Investing in staff, whether it is through funds for support of training or time for in-service training, will be returned by greater productivity, higher-quality meals, and improved service to the students (Pannell-Martin, 1999).
Directors of school meal programs are responsible for encouraging staff to practice hygiene and food safety procedures. Commitment by directors and school administration is essential to influence attitudes and actions of staff to ensure goals of the school foodservice program are met. Although school FSDs believe food safety is important, there is need for additional training and improvements (Giampaoli, Sneed, Cluskey, & Koenig, 2002). Giampaoli, Sneed, et al. (2002) also found school FSDs were positive in agreement about benefits of continuing education in food safety for selves and staff but were neutral on spending money and time to certify staff. Youn and Sneed (2002) also found school FSDs identified a need for continued employee training. Food safety training reduces waste, assists in safe food production, promotes a strong program image, and improves staff retention (Pannell-Martin, 1999).

Professional and noncertified school foodservice staff are able to join the professional organization of the SNA. Membership benefits of dues-paying members include on-line course work, mentor programs, networking, hands-on workshops, and training. Some of the training program topics are: purchasing, cost control, marketing, and food safety and sanitation. In 2008, SNA reported 45% of members had received certification for 10 hours of sanitation and food safety training, and to date, 35,000, or 64%, of the members have enrolled and received certification for 10 hours of sanitation and food safety training as a component of the SNA certification process (SNA, 2008).

Training should reach all staff, new and continuing. Employee training has associated costs, whether these costs are time away from the kitchen for training, trainer fees, or material and supply expenses. Training programs for new staff should be mandatory and provide the knowledge and skills needed to handle food safely in school kitchens. Current
staff might know the correct procedures, yet continual training will reinforce the concept to ensure these are followed. Training should be on-going, practiced by staff, and monitored by management. There is often a gap between what is required and what is demonstrated. Managers should observe staff and provide feedback to overcome the gaps.

**Support for School Foodservice Program from School Business Officials**

Financial crises in school districts has led to school administrators looking at ways to balance the budget and focus on education rather than district services, such as foodservice (Stracener & Boudreaux, 1997). A deficient budget situation siphons money from a district’s general fund and means money is used to balance the foodservice fund rather than buy school books (Smeltz, 2008). The increased pressure on school district budgets decreases the likelihood that districts will subsidize meal programs if they operate at a loss (Stainbrook, 1991). Increases in food, milk, and energy costs, combined with high labor and benefits costs, are having an impact on school nutrition program budgets (SNA, 2007; USDA, 2008b). School nutrition programs continue to struggle with lagging reimbursements, unfunded or underfunded mandates, increased indirect costs, and unpaid student meal changers. According to the SNA (2010) trends report, responding directors anticipated increases in budget for food costs (87.6%), labor (63.8%), and indirect costs (55.0%). Ongoing budget concerns are pressing concerns for districts nationally.

Just as the district provides funding and release time for in-service and professional development to instructional and administrative staff, noninstructional staff, including those working in school foodservice programs, should be provided the same educational opportunities from the same funding source, typically the district’s general fund. Student meal programs are part of the total educational and school environment and help promote
healthy behaviors. School foodservice programs provide critical links between learning and achievement. These links are defined as improved attendance (Gunderson, 1971), decreased tardiness, higher test scores (Potts-Datema, 2005), and retaining children in school (J. Martin, 1996). Increased meal participation supports the financial status of the school foodservice program and provides assurance that children are receiving adequate nutrition, thus ensuring academic performance is not compromised. School meal programs need the support of the school district administration to operate as an integral part of the school day.

School business officials (SBOs) are part of the district administration. The SBO has the important function of ensuring school district budgets are balanced (J. Martin, 1996). School administrators need to have an understanding of the complexities of the school foodservice program and be supportive and endorse a positive image of the program. Examples of demonstrated support for the school foodservice program include providing adequate meal time periods, assistance with payment collection methods, setting satisfactory meal prices, providing training funds, setting board-level policies (Strohbehn & Litchfield, 2008), maintaining physical areas, authorizing staff to provide monitoring of children during mealtime, establishing food safety policies (Sneed & Henroid, 2003), and defending the program to various stakeholders (March & Gould, 2002).

It is generally recognized that school meal programs should be self-supporting. Pannell-Martin and Applebaum (1999) observed that school FSDs are often responsible for operational budgets equivalent to a million-dollar business. These operations are accountable to taxpayers and must be managed in compliance with regulations of the legislated program.
Purpose of the Study

The purpose of this study was to determine support within one USDA region toward implementation of the food safety plan mandated in the Child Nutrition and WIC Reauthorization Act of 2004. School FSDs’ assessed level of implementation of a mandated school food safety plan in their school districts, assessment of district board-level food safety policies, identification of district food safety training efforts, and perceived support by district administration for the foodservice program were compared with SBOs’ self-reported knowledge of food safety plans in their districts, attitudes toward food safety policies, and identified level of district support for food safety training.

Specific objectives of this study were to determine:

1. What are FSDs’ assessed levels of implementation of a HACCP-based food safety plan in their districts?
2. What are FSDs’ perceptions of support from district administration for child nutrition programs?
3. What are the attitudes and knowledge of FSDs toward personal food safety practices?
4. Do differences exist between FSDs’ attitudes toward food safety training and personal food safety practices?
5. What is the knowledge and attitudes held by SBOs about HACCP-based food safety plans in child nutrition programs?
6. Do differences exist between FSDs’ perceptions of support from district administration for child nutrition programs based on demographic characteristics?
of age, gender, educational level, years of service, membership, and certification or credentialed status in SNA?

7. Do differences exist between FSDs’ perceptions of support from SBOs toward child nutrition programs based on district foodservice programs’ characteristics of student enrollment, type of production system, number of foodservice staff, and management?

8. Do differences exist between perceptions of FSDs and SBOs about importance of district food safety policies?

9. Does a relationship exist between districts’ level of support (release time, funding for continuing education, and in-service programs) and FSDs’ assessed level of implementation of a HACCP-based food safety plan in their districts?

10. What role does the state agency play in monitoring and compliance with reauthorization mandates?

**Significance of the Research**

This research study will benefit all foodservice operations with programs administered under USDA federal guidance, including the NSLP, SBP, After-School Snack Program, Head Start, Residential Child-Care Institutions, Summer Food Service Program, Child Care and Adult Food Program, Special Milk Program, Supper Program, and the Fruit and Vegetable Program, as well as school administrators and SBOs. Data will add to the body of knowledge about food safety program implementation given that the Child Nutrition and WIC Reauthorization Act of 2004 required HACCP-based plans for districts beginning with the 2006–2007 school year.
To date, little research has been conducted to assess actual perceived levels of implementation of a school food safety plan, as described in the *Guidance for School Food Authorities* (USDA, 2005a), or district administrative support for food safety training. This exploratory study identified the relationship between the level of implementation of school food safety plan and administrative support for food safety training. Limited research has been published about administrative support of food safety programs in school districts. Therefore, data gathered during this study will be beneficial to school FSDs when planning future food safety training for child nutrition programs following changes in regulations in regards to food procurement or handling, when foodborne pathogens increase, as the food supply changes, and as the staff become more diverse. The USDA (2005a) *Guidance for School Food Authorities* outlines the purpose, requirements, and steps in the development of a school food safety plan program. This study provides informal feedback as to the effectiveness of this guidance.

**Assumptions of the Study**

The researcher assumes FSDs and SBOs honestly and accurately reported information, and returned complete surveys.

**Limitations of the Study**

The sample of FSDs and SBOs were limited to those from the population of public school districts serving students in grades K–12 with enrollments from 2,500 to 25,000 students in the states comprising the USDA Mid-Atlantic region. The school districts in this sample represented districts from rural, suburban, and urban cities. Districts with enrollments smaller than 2,500 might not have a designated a FSD; might have offered fewer menu choices and had fewer production and service sites in the district, and/or might have
been unable to articulate their food safety process. School districts with over 25,000 students might have a different infrastructure, larger budget, and additional support staff solely assigned to monitoring food salary compliance. Although school districts in the territories of Puerto Rico and U.S. Virgin Islands are part of this USDA region they were not surveyed because both are outside the continental United States, because of the study’s restrictions in enrollment size, and because of the perceived inability to clarify any survey questions via telephone. The District of Columbia was not represented because of restrictions in enrollment size, as the school district’s enrollment exceeds 25,000 students.

The survey response rate may be a factor as a low response rate will not be reflective of the entire region. Additional limitations may include accuracy of self-reporting information and lack of cooperation from FSDs or SBOs. Securing valid addresses and contact information for the sample population may have been problematic. All communications and surveys were paper-and-pencil and sent via the postal service unless the participant specifically requested an on-line survey.

**Definitions of Terms**

The following terms or definitions were used in this study:

*Base kitchen:* A school kitchen in which foods are prepared and served onsite at the production school and also transported to other schools or satellites for service; also known as a regional kitchen (Unklesbay et al., 1977).

*Centralized food production facility:* Foodservice system design to prepare food for large groups; may serve food on site or prepare for off-site delivery, catering, or vending machine; items may require finishing preparation when received or may be ready to serve (Barry & Litchford, 1998).
Central kitchen: A food production facility in which food is produced for service off site in receiving (satellites), often a large production facility; also known as a commissary (Unklesbay et al., 1977).

Contract feeding: Foodservice provided through an outside firm; may include outside management, personnel, and food purchasing (Silberberg, 1997).

Conventional foodservice system: A foodservice system in which ingredients are assembled and food is produced on site, held either heated or chilled, and served to customers; some foods are purchased fully prepared and require only portioning and service, whereas other products require full preparation; it is very labor intense (Unklesbay et al., 1977).

Flow of food: A path, from receiving through storing, preparation, serving, cooling, and reheating, that food follows in a foodservice system (Barry & Litchford, 1998).

Food production center: A facility in which food is prepared to be served at another location (Barry & Litchford, 1998; Silberberg, 1997).

Foodborne disease or illness: Infection or intoxication caused by microbial or chemical contaminants in food (Healthy People, 2010).

Hazard Analysis Critical Control Point (HACCP): A food safety system that focuses on the flow of food in a foodservice operation in order to reduce the risk of foodborne illness (Barry & Litchford, 1998); a systematic approach to construct a food safety program designed to reduce the risk of foodborne hazards by focusing on each step of the food preparation process—from receiving to service (USDA-FNS, 2005a).

Kiosk: A small, free-standing structure with open sides (Barry & Litchford, 1998) and a decentralized dispensing or serving area that is sometimes mobile (Silberberg, 1997).
Personal hygiene: Habits of the food handler, which include clean clothes/uniform, hand washing practices, good health, and neat and clean body (NRAEF, 2008).

On-site kitchen: A kitchen that prepares and serves food at the same location (Barry & Litchford, 1998; Silberberg, 1997).

Satellite kitchen: A site that receives prepared food from a central kitchen; food is transported (cold, frozen, or hot) to this location and may be transported in bulk food containers and portioned and served at the satellite school or sent preplated from the central kitchen to the satellite school (Barry & Litchford, 1998).

School business official (SBO): Financial officer in a public school; common titles are: Business Manager, Business Administrator, or Assistant Superintendent for Finance (M. Braun, July 11, 2008 personal communication).

Self-contained kitchen: A kitchen in which food is prepared and served on the premises; also called an on-site production kitchen (Barry & Litchford, 1998; Silberberg, 1997).

Standard operating procedure (SOP): A step-by-step written guideline for routine tasks to reduce food safety hazards; a foundation for the food safety program (USDA-FNS, 2005a).

Traditional system: Referred to as conventional system or self-contained kitchen where food is prepared and served at the same place; according to National School Foodservice Management Institute’s (NSFMI) research 70% of schools in the United States use this type of system (Barry & Litchford, 1998).

Transportation: In the event food is prepared in one place and served in another, transportation activities include moving food and nonfood products, can storage and
cleaning, return of soiled ware for sanitizing or disposal, and the collection and disposal of plate waste (Barry & Litchford, 1998).
CHAPTER 2. LITERATURE REVIEW

Introduction

Serving safe food is critical for school foodservice programs and key to a healthy school environment (USDA-FNS, 2005a). Protecting customers and employees ensures repeat business. Safe food handling leads to lower food cost and maintains appearance, flavor, and texture of foods (NRAEF, 2008). Food that is stored properly, prepared correctly, and served appropriately yields a quality product. If foodborne illness occurs, attorney fees and insurance costs escalate and there is loss of revenues due to decreased participation in school meals (Marx, 2008). Costs associated with foodborne illness also include lower employee morale, absenteeism, loss of prestige, bad publicity (NRAEF, 2008), and student absenteeism affecting student performance in school (Marx, 2008). Keeping foods safe is a critical part of healthy eating, as recommended by the *Dietary Guidelines for Americans* 2010 (USDA & U.S. Department of Health and Human Services, 2010).

Foodborne illnesses are diseases carried to people by food (NRAEF, 2008). In 2010, the CDC released new estimates of foodborne illness outbreaks in the United States. Each year, an estimated 9.4 million illnesses, 55,961 hospitalizations, and 1,351 deaths result from consumption of foods contaminated with *known* disease agents (Scallan, Griffin, et al., 2011; Scallan, Hoekstra, et al., 2011), and an additional 38.4 million illnesses, 71,878 hospitalizations, and 1,686 deaths are estimated from consumption of foods contaminated with unspecified agents.
**Food Safety in Retail Foodservices**

**Incidences**

FoodNet data showed *Salmonella* spp. has not declined in 15 years (CDC, 2011). *Salmonella* spp. is the most common infection annually and the most common cause of hospitalization and death tracked by FoodNet. *Salmonella* spp. can contaminate a wide range of foods. There are many different types of *Salmonella* spp., and each type tends to have different animal reservoirs and food sources, making control challenging. Vibrio infections are rare, but often serious, and are caused by eating contaminated seafood or exposing an open wound to seawater. These cases of infection continue to increase. Infection caused by *Escherichia coli* (*E. coli*) has declined by 44%. Downward trends in food borne infections can be attributed to: cleaner slaughter methods, microbial testing, better inspections in ground beef processing plants, regulatory prohibition of beef contaminated with *E. coli*, improvements in the U.S. Food and Drug Administration (FDA) model food code (FDA, 2009), and awareness in retail and institutional foodservice sites and consumers’ home for consumption of undercooked ground beef.

In the winter of 1993, the Jack in the Box restaurant chain was linked to an *E. coli* O157:H7 outbreak. This bacterial strain normally lives in the intestines of humans and animals and is known to produce toxins that can cause diarrhea. However, toxin-producing strains, called Shiga toxin-producing *E. coli*, can be acquired by eating contaminated food and consuming meat that is rare or inadequately cooked. One strain from this group, known as *E. coli* O157:H7, can cause severe diarrhea and kidney damage. *E. coli* O157:H7 sickened over 700 people in four states and led to 171 hospitalizations and 4 deaths. Findings of causes were twofold: Employees were undercooking the hamburgers and contaminated meat
was sourced from undetermined slaughter houses. As a result of the outbreak, the restaurant chain lost over $160 million in both lost sales and court costs (Marler, 2008). The outbreak did lead to changes in meat inspection, regulations, and cooking recommendations.

During the early winter of 2006, an outbreak sickened 81 people in three states who were patrons of Taco John’s. Twenty-six people were hospitalized, and two suffered a type of kidney failure called hemolytic uremic syndrome. Shredded lettuce was identified as the likely vehicle of transmission in the outbreak. As late as 2011, the FDA was still conducting ongoing investigations, as *E. coli* O157:H7 bacteria in samples were associated with samples gathered from dairy farms near the lettuce growing areas (FDA, 2011).

During August–September of 2006, CDC (2006b) reported outbreaks in 26 states with a total of 183 persons infected with a strain of *E. coli* O157:H7. Of these cases, 95 (52%) people were hospitalized, 29 (16%) had hemolytic uremic syndrome, one person died, and there were possibly two additional related deaths. Close to 95% of patients reported consuming raw spinach before showing signs of illness symptoms, and the FDA identified implicated the spinach was grown in three California counties (CDC, 2006b). Later in 2006, the CDC reported an outbreak in four northeastern states where public health investigators identified a few ingredients (lettuce, cheddar cheese, and ground beef) that were consumed by Taco Bell restaurant patrons who became ill. Of the 71 ill persons, 53 (75%) were hospitalized, of which 8 (11%) developed hemolytic uremic syndrome, and a total of 52 cases were confirmed for *E. coli* O157 strains. The CDC (2006a) suggested that, because many Taco Bell restaurants were involved during the same time period, contamination of lettuce likely occurred before reaching the restaurants.
During 2010, the CDC and the Washington State Department of Health confirmed food served at Taco Bell restaurants was the source of *Salmonella* Hartford and *Salmonella* Baildon outbreaks, yet a particular food item or supplier had not been identified (Schreck, 2010). Mid-winter of 2011, 14 people in five states were identified with an outbreak of strain E. coli O157:H7. Food sources appeared to be from Seltzer Brand Lebanon bologna (Rothschild, 2011). In late summer of 2011, a *Salmonella* Heidelberg outbreak was traced to Cargill ground turkey with cases found in 34 states. Over 107 people became sick and one person died. There were two recalls that included 36 million pounds of ground turkey (H. Martin, 2011).

In a recent outbreak of *Listeria monocytogenes* in September and October of 2011, Colorado cantaloupes from Jenson Farms caused 29 deaths and illness in 139 people (Goetz, 2011). Prior to the Colorado incident, Del Monte cantaloupes were found to be connected to 12 cases of *Salmonella Panama* poisoning in four states traced to a farm in Asuncion Mita, Guatemala (Rothschild, 2011). The CDC reported that eight of the people who got sick had eaten cantaloupes purchased from the same Costco warehouse club. Investigation of whether the fruit had come from the same Guatemalan farm is still in progress (Neuman, 2011).

**Risk Factors**

The CDC gathered data on all confirmed foodborne outbreaks from 1982 to 1997. Clinical profiles were developed based on outbreak characteristics. A total of 2,246 foodborne outbreaks were identified. The outbreaks were divided by strain and whether the etiology was known or unknown. Of the 697 (31%) with known etiology, *Salmonella* spp. accounted for 65% of these outbreak. Of the 1,549 (69%) with undetermined etiology, norovirus, *Clostridium perfringens*, *Bacillus cereus*, *Staphylococcus aureus*, and *Salmonella*
spp. were suspected. Poor personal hygiene and improper holding times and temperatures were suspected as contributing factors (Hedberg, Palazzi-Chruas, Radke, Selman, & Tauxe, 2008).

Restaurants are important settings for foodborne disease transmission. The Environmental Health Specialists Network identified factors in 22 restaurants contributing to outbreaks from June 2002 through June 2003. The most common foodborne pathogen was *Norovirus*, which was responsible for 42% of the confirmed foodborne outbreaks during this period. Contributing factors were identified as food handling by an infected person (65%) and bare-hand contact with food (35%). A concurrent study found that, in restaurants that did not have confirmed outbreaks, 71% employed certified kitchen managers and the occurrences of bare-hand contact with foods as a contributing factor was fewer. Certification of kitchen managers in food safety, in addition to food safety training programs, appeared to be an important outbreak prevention measure (Hedberg et al., 2006). Factors associated with contributing to occurrence of foodborne outbreaks in restaurant settings include: improper storage or handling temperature, inadequate cooking, contaminated equipment, poor personal hygiene of food handler, and food obtained from unsafe sources (Hedberg et al., 2008).

**Food Safety Management Systems**

K. R. Roberts and Sneed (2003) conducted research to determine the extent to which prerequisite and HACCP programs were implemented in independent restaurants in Iowa. HACCP programs are one means to ensure the safety of food. They found only 8% of the restaurant managers indicated they had a comprehensive HACCP food safety plan in place. The majority of prerequisite programs were reported as not implemented. The researchers
also found a greater number of food safety practices were implemented in restaurants where a manager had food safety knowledge or training.

K. R. Roberts, Barrett, and Sneed (2005) conducted a study to obtain baseline data about the presence of HACCP and prerequisite programs in chain and independent restaurants in Iowa and Kansas through a written questionnaire for sanitarians. The researchers found prerequisite program most often lacking in independent restaurants with limited use of HACCP-standardized recipes and little reported progress in prerequisite program implementation in the previous 5 years. Results indicated that important food safety practices were not yet implemented in Iowa and Kansas restaurants (K. R. Roberts et al., 2005).

In another study, Almanza and Ghiselli (1998) evaluated two grill-type foodservice operations to determine the length of time required to implement a HACCP food safety plan. Grill-type operations’ procedures and policies were reviewed. A pilot HACCP system was developed, including flow charts, critical limits, corrective procedures, and checklists for the two grill operations to pilot during a 2-week period. Data were gathered to determine the length of time needed to complete the checklists. The study found it took approximately 30 minutes for managers to complete checklists (Almanza & Ghiselli, 1998).

Legislation and Oversight of School Meal Programs

Historical Overview of School Meal Programs

School meal programs that operate during the school year include the NSLP, SBP, After-School Snack Program, Special Milk Program, and the Fresh Fruit and Vegetable Program. These programs offer nutritious meals and snacks and provide an opportunity for children to practice skills learned in classroom nutrition education as well as promote
learning readiness and healthy eating behaviors. In addition, the meal programs provide milk for children who do not have access to school meals and encourage children by regions the opportunity to choose more fresh fruits and vegetables during the school day. These school meal programs receive federal assistance and operate in over 101,000 public and non-public private schools and residential child care institutions in the United States (SNA, 2011b).

The NSLP nutrition standards for lunches are consistent with the Dietary Guidelines for Americans, which recommend no more that 30% of calories from fat and less than 10% of these from saturated fat. During the first year of the NSLP in 1946, only 7.1 million children participated. Currently meals are available to over 50 million children each school day (Food Research and Action Center ([FRAC], 2007d). An average of 31.6 million per children per day ate a reimbursable lunch in fiscal year 2010; 64.88% of these meals were served as free or reduced priced lunches as noted in the Code of Federal Register (USDA, 2011b). Federal support for the NSLP was close to $10 billion in 2010 (USDA-ERS, 2011).

The SBP was established in 1966 as a 2-year pilot program to assist schools serving breakfast to “nutritionally needy” children. The program was permanently established by appropriations in 1975. School breakfast meals provide one-fourth of the daily recommended levels for key nutrients (FRAC, 2007b; USDA 2011d). During 1966, the first year of the pilot program, 80,000 children received breakfast (USDA, 2011d). The SBP currently operates in nearly 85% of schools that participate in the NSLP (USDA, 2011d), or approximately 84,500 schools (FRAC, 2007a; USDA, 2007e, 2007f). More than three out of four schools that serve lunch also serve breakfast (FRAC, 2007a). In some states, West Virginia and New Jersey, breakfast is mandated. Over 11.6 million children ate school breakfast during fiscal year 2010; in this same period 83.63% were served free or reduced-
priced breakfasts as identified in the *Code of Federal Register* (USDA, 2011b). The federal reimbursements for the SBP during fiscal year 2007 were over $2.0 billion (USDA, 2011d).

The SMP provides milk to children in school and childcare settings who do not participate or have access to other federal meal programs. However, districts participating in the NSLP and SBP may participate in the SMP and will be reimbursed for milk served to enrolled children (J. Martin, 1999b). In 2006, over 96 million half-pints of milk were served through the SMP at an annual cost to USDA of $14.8 million (USDA, 2011e).

The pilot program for the Fresh Fruit and Vegetable Program (USDA, 2007d) began in 2002 and operated in only four states. It has since expanded to all 50 states and the District of Columbia as part of the 2008 Farm Bill. Districts participating in the Fresh Fruit and Vegetable Program provide free fresh fruits and vegetables to children outside of children’s regular meal service (USDA, 2007c). Funding was set at $9 million for the first eight states and reduced to $6 million for the remaining states (USDA, 2007c).

Programs that operate outside the school day or year include summer foodservice and child and adult care programs. The Special Food Service Program for Children started in 1968 as a 3-year pilot for day-care and summer meals (FRAC, 2007c; USDA, 2007a, 2007b). Under the NSLA and the Child Nutrition Act of 1966 and the amendment of 1975, the summer program and the day-care, or Child and Adult Care Food Program, were split into two programs. The Summer Food Service program was created in 1968 as an entitlement food security program. It began as a pilot program with grants to states for meal provision to low-income children when school was not in session (USDA, 2007g, 2011a). In the first year, 1969, nearly 1.8 million meals were served to children (USDA, 2007a); currently over 1.9 million meals are served per year (USDA, 2007g, 2011a). Federal support for the
program during the fiscal year of 2007 was $286 million dollars (USDA, 2007g, 2011a). The Child and Adult Care Food Program also was founded in 1968 to provide meals and snacks to children and adults who receive care in nonresidential day care centers. At the inception of the program, fiscal year 1969–1970, 39,800 meals were served; currently over three billion meals and snacks are served to children and adults each year (USDA, 2007b). Of the meals served, it is estimated over 80% were provided to those at risk of food insecurity. Current program costs are over $2 billion (USDA, 2007b). The Child and Adult Care Food Program has expanded to reach children and adults in emergency shelters and after-school care programs (USDA, 2007a).

**Legislative Impacts on Meals Programs**

During the 1930s, aid for the school meals program came from the Reconstruction Finance Corporation (Gunderson, 1971). During the 79th Congress, Public Law 396 approved a permanent school meals program, which became known as the NSLA (Gunderson, 1971). Until this time, federal funds were authorized year to year for school lunch and school milk programs. The underlying foundation of the bill included comprehensive legislation for assistance to schools that met described meal patterns, allowances for commodities, support for asset purchases such as startup equipment, and matching rates for federal funds (Gunderson, 1971). Amendments to the NSLA have continued over the years to the present. These amendments changed the formula on how funds were appropriated to schools outside the continental United States (i.e., to U.S. territories) and extended the SMP (Gunderson, 1971). The SMP became part of the NSLA and the Child Nutrition Act of 1966. As part of this act, sweeping changes occurred such as authorization of the pilot breakfast program appropriations, the establishment of National
School Lunch Week, the funding of nonfood assistance, provision of state administrative funding, and the approval of a proposal to authorize all school foodservice programs under one agency for guidance and supervision (Gunderson, 1971). In May of 1968, Congress amended the NSLA and Child Nutrition Act of 1966 to include private and nonprofit institutions, day-care centers, summer programs, and services for handicapped children (Gunderson, 1971). Prior to the 91st Congress, the NSLA did not address needy children, just those above poverty levels. In 1970, an amendment to the Richard B. Russell National School Lunch and Child Nutrition Act of 1966 brought significant changes concerning requirements for providing free or reduced-price lunches to needy children (Gunderson, 1971). During the next 10 years, further amendments to the National School Lunch and Child Nutrition Acts were introduced to provide direct certification for those families receiving food stamps (Pennsylvania Department of Education, 2007). Amendments also have addressed the Coordinated Review Effort (CRE), School Meals Initiative for Healthy Children (SMI), and New Menu Planning Systems (Pennsylvania Department of Education, 2007). These amended components of CRE and SMI include a standardized compliance review process developed by the USDA and conducted by the state agency for schools with NSLP, SBP, and After-School Snack Programs (SNA, 2008). In 2004, Public Law 108-265, known as the Child Nutrition and WIC Reauthorization Act, addressed regulations to strengthen nutrition programs and the health of the child. These federally mandated polices addressed wellness and food safety but were unfunded. Districts participating in child nutrition programs were required to develop by June 2005 a district wellness policy and implement a food safety program for the preparation and service of school meals served to children based on HACCP principles. Later, the date for compliance was moved to June 30,
2006. Another mandate addressing food safety in the Child Nutrition and WIC
Reauthorization Act of 2004 amended section 9(h) of the NSLA and required an increase
from one to two health/safety inspections for each school kitchen participating in the NSLP
and SBP and required inspection reports to be posted each year and available upon request
(P. L. 108-265). This rule enhances the safety of over 38 million meals served in federal
programs to school children daily (USDA, 2009a). Prior to P.L. 108-265, there were no
federal requirements for a HACCP-based food safety plan for school meal programs
participating in the NSLP and SBP. Guidance for these mandates was made available to
schools a year after the reauthorization date in July of 2005 (USDA, 2009a).

The Healthy, Hunger-Free Kids Act of 2010 (P.L. 111-296) was signed into law mid-
December of 2010 with an effective date July 1, 2011 (USDA, 2011b). Section 204
strengthens local wellness policy (LWP) compliance, implementation, evaluation, and
assessment; adds goals for nutrition promotion; and expands LWP membership, requiring
teachers of physical education, school health professionals, parents, students, representatives
of the school food authority, the school board, school administrators, and the public to
participate in the development of wellness policies. The provisions from section 205 address
the flexibility to increase paid lunch prices, as these prices on average must be equal to the
difference in prices between and free and paid lunch reimbursement using USDA guidance;
other school meal prices were not impacted by this legislation. Section 206 requires all
nonreimbursable foods to generate revenue equal to the cost of an item. During the
performance review, as noted in section 207, findings and violations are required to be made
available to the public. In section 210, 243, school and organic gardens and farm to school
activities are noted. Section 306 establishes professional educational standards for staff
through training programs, and certification requirements for foodservice staff and directors. All the sections noted are unfunded mandates with the exception of sections 210, 243, and 306, for which funding was defined, but it’s uncertain how funds will be diverted to local educational agencies (USDA, 2011b).

**Schools and Food Safety**

Young children are at increased risk for foodborne illness; thus safe food preparation in school lunch programs is critical (Richards et al., 1993). The food served as part of the school meals programs should be healthy and safe (Shield & Mullen, 2002). Preventing foodborne illness is an important concern in school settings because outbreaks have personal, academic, financial, and legal consequences for each school district (Marx, 2008). Student absenteeism affects a student’s performance in school, and if a foodborne illness outbreak occurs, school districts could experience increased insurance costs, attorney fees, and loss of revenues due to decreased participation in school meals (Marx, 2008).

The CDC (2005) noted that the nation’s 119,000 schools are ideal settings for educating the nation’s young people about food safety. The CDC (2005) stated “schools are the only institutions that can reach nearly all youth; they are in a unique position to improve both the education and health status of young people throughout the nation” (p. 1). Children under the age of nine are considered an at-risk population and can more easily contract a foodborne illness from eating or drinking contaminated substances. In a 10-year study conducted between 1990 and 1999 by the GAO (2003), 3% of reported foodborne illness outbreaks occurred in schools. Daniels et al. (2002) studied the outbreaks that occurred in the period between January 1973 and December 1997 and found there were 604 school-related outbreaks reported to the CDC from state and local health departments. The
commonly implicated food vehicles were poultry (18.6%), salad (6%), Mexican-style food (6%), beef (5.7%), and dairy not including ice cream (5.1%). The commonly reported food practices contributing to the school-related outbreaks were improper food storage, food contaminated by a food handler, and improper holding temperatures (Daniels et al., 2002). Other improper behaviors that have been noted during observational research and survey studies in schools are poor handwashing (Henroid & Sneed, 2004; Strohbehn, Sneed, Paez, & Meyer, 2008), lack of hair restraints (Gilmore et al., 1998; Giampaoli, Cluskey, et al., 2002), lack of calibration of thermometers (Henroid & Sneed, 2004), improper reheating of foods (Kim & Shanklin, 1999), inappropriate sanitizing, improper heating and cooling (Henroid & Sneed, 2004), and consumption of food in a preparation area (Giampaoli, Sneed, et al., 2002). In general, these studies found proper food-handling practices in schools were not being followed consistently.

Previous research has focused on risk factors associated with foodborne illnesses in school foodservice operations including food handling and personal hygiene practices (GAO, 2003; Giampaoli, Clusky, et al., 2002; Gilmore et al., 1998; Sneed & Henroid, 2003; Youn & Sneed, 2002). Some studies have noted that, although staff knowledge of food safety was evident, proper food safety practices were not implemented.

**Incidences in Schools**

The GAO (2002a, 2003) reported a total of 195, or 3%, of the 7,390 foodborne outbreaks nationwide between 1990 and 1999 occurred in schools. “Few outbreaks of foodborne illness have been reported in connection with the USDA’s school meals programs” (GAO, 2000, p. 14). Daniels et al. (2002) found that, between the years of 1973 and 1997, state and local health departments reported 604 outbreaks of foodborne illness in
schools, with an annual median number of 25 and a range from 9 to 44. In 60% of the outbreaks, an etiology was not determined (Daniels et al., 2002). *Salmonella* spp. was the most commonly identified pathogen associated with 36% of the outbreaks reported in the Daniels’ et al. (2002) study. The most commonly associated food handling practices identified in school-related outbreaks were improper temperatures for storage and holding, and food contamination by staff (Daniels et al., 2002) and inadequate cooking, poor food worker hygiene, and improper hot holding and cooling of foods (GAO, 2000).

Between October 1997 and October 1998, there were 16 outbreaks of foodborne illness associated with eating burritos; all but one of these outbreaks occurred in schools. Shortly after consuming the burritos over 1,700 children became ill; the cause of the outbreak was never determined. In March 1997, an outbreak of hepatitis A caused by contaminated strawberries donated by the USDA sickened more than 200 teachers and students in Michigan and about 50 people in other states. These foods were contaminated prior to delivery to the school meal programs. In October 1998, 11 children were infected by *E. coli* O157:H7 in school lunch taco meat in Finley, Washington. Three of these children developed hemolytic uremic syndrome; a jury found that the school district was at fault and awarded $4.75 million to the affected children (GAO, 2003). Studies from school districts in the states of Georgia, Oklahoma, Rhode Island, and Massachusetts highlighted foodborne outbreaks that occurred between 1985 and 1990. In May of 1985, 351 children and staff from a Georgia elementary school developed fever febrile gastroenteritis. Of the children tested, 100 were isolated and 23 were hospitalized, but none of the illnesses were fatal (CDC, 1985). The illness was strongly associated with the turkey salad from the school lunch meal. The turkey was cooked on site by kitchen staff and then deboned. The kitchen inspection did
not reveal any malfunctioning equipment; however, the investigation did find that after deboning the turkey was stored overnight and placed into eight-inch deep pans in the cooler (CDC, 1985). It is suspected that proper cooling procedures were not followed as the warm turkey placed in a pan over four inches deep could have maintained a temperature of over 50°F, which is in the temperature danger zone (CDC, 1985). The pathogen isolated from more than 100 children was *Salmonella* spp. In 1986, an outbreak of *Salmonella* spp. occurred in a public school system in Oklahoma and affected 2,130 students and staff. Symptoms were diarrhea, nausea, vomiting, abnormal cramps, and fever. Of these students and staff exhibiting outbreak-related illnesses, strains of *Salmonella* Heidelberg (27 cases) and *Salmonella* Stanley (58 cases) were found and 22 patients were hospitalized with gastroenteritis. Students were affected more than were teachers, and 11 cafeteria workers became ill. Food served in the four schools was prepared at one location. The food associated with the illness was chicken; the investigation found chicken was left to thaw at room temperature, cooked for 2 hours in the steamer, and held in the steamer overnight at a low setting. Thus, this potentially hazardous food was not stored properly under refrigeration, and bacterial cells were able to reproduce to harmful levels (CDC, 1987). Outbreaks of *Salmonella* spp. contamination can be damaging and costly. The medical expense claims totaled $40,000 for this district. Lost income to the school foodservice program was not identified (GAO, 2002b).

In 1990, *Staphylococcal* food poisoning occurred in four elementary schools in a Rhode Island school district. Over 662 meals were prepared at a central kitchen with 100 cases reported (Richards et al., 1993). Meals served by the school were: 144 lunches at school A with 67 illness reported, 153 lunches served at school B with 27 illnesses reported,
121 lunches served at school C with five illnesses reported, 78 meals served at school D with one illness reported, and 166 lunches served in the central kitchen with zero cases reported (Richards et al., 1993). Staphylococcus aureus was present in 67% of the children who became ill. A case was defined as a person who experienced at least one of the symptoms within 8 hours of eating lunch at school. All of the food was transported from the centralized school site. No foodborne incidents were reported at the centralized school site. The menu was sliced ham, baked beans, corn, bread, butter, and milk. Within 2 hours of eating lunch, children started to show symptoms of illness such as vomiting, nausea, cramps, headache, fever, and diarrhea (Richards et al., 1993). The investigation consisted of collection of clinical specimens, on-site kitchen sanitation inspections of all schools, and face-to-face interviews with all children in attendance on that day. Of the seven food samples recovered as part of the kitchen inspections, half were found in the dumpster and mixed with other foods and debris. Findings suggested a higher rate of incidence occurred in two of the four satellite schools. Thermometers were not present in any kitchens for food temperature monitoring, transport/holding units did not maintain proper temperature, and large quantities of warm food were found stored in closed food cabinets in the refrigerators (Richards et al., 1993). It was estimated hams were held between 50°F and 120°F for a minimum of 15 hours. Kitchens were found to be clean but did not have written operating procedures for holding potentially hazards foods cooked a day or more ahead of serving. The thawed hams were steamed for 105 minutes and allowed to cool at room temperature for 45 minutes. After cooling, three staff members were assigned to remove the casings; each ham was kept whole until the next day. The three staff members responsible for the food preparation of the ham removed the casings and sliced the ham without gloves. Of the three staff members, two
were found to be asymptomatic, culture negative, and one staff tested positive for carrying
the implicated enterotoxin strain *Staphylococcus aureus*. Richards et al. (1993) reported the
staff member testing positive also served the meal at the preparation school. The next day
preparation was also problematic as the food was not reheated to 165°F before parceling for
transport to the four schools. On the day of service, the hams were sliced and warmed for 20
minutes. In this scenario, the centralized food preparation system contributed to the
outbreak. The contamination may have occurred when the casings were removed from two
of the nine hams by a food handler who carried *Staphylococcus aureus* as well as by the
improper reheating, lack of refrigeration, and prolong handling (Richards et al., 1993).

The Massachusetts Department of Public Health (CDC, 2006a) received multiple
reports about 10 outbreaks of gastrointestinal illness among 309 school age children in nine
different schools between February 2003 and May of 2004. Of these 309 cases, 67 children
became ill. The outbreaks were characterized by a short incubation period and short length
of illness. The neurological symptoms were headache and dizziness, and the gastrointestinal
symptoms included cramping, nausea, and vomiting. Ingredients in the tortillas from a single
processor in Chicago, Illinois were found to be contaminated with chemicals. In another
incident occurring during this 15 month period, 10 separate incidents were reported in
Middlesex and Suffolk counties. A total of 31 children became ill after eating lunch. In the
following year, 2004, a total of 36 children became ill after eating lunch in Suffolk County
(CDC, 2006a).

Because foodborne illnesses have occurred in school settings due to factors including
contaminated food, poor hygiene practices, and improper preparation, a need was identified
to provide further guidance to address food safety. The GAO (2000) noted there was not one
federal agency that monitored the safety of school meals. Primarily two federal agencies, the FDA and USDA, have the responsibility to ensure safety of the nation’s food supply. The USDA Food Safety and Inspection Service (FSIS) is responsible for the safety of meat, poultry, dairy, and some egg products, whereas the FDA has regulatory oversight for most processed foods items, including seafood and shellfish.

**Food Recalls**

Another limitation of the safety system in schools is notification about recalls, as commodity-donated foods may not be identified. During 1997 and 1998 five incidents of USDA-donated foods occurred. The foods implicated were strawberries, poultry, and ground beef (GAO, 2000). Over 1.7 million pounds of strawberries were known to be associated with an infectious hepatitis A virus outbreak. The outbreak occurred in four states and affected 254 children and staff (GAO, 2000). USDA-donated beef was suspected in a Findley, Washington outbreak that affected 11 school children in September, 1998. A processing plant recalled 2 million pounds of ground beef that was contaminated with *Salmonella* spp. A large food recall occurred in January 2008 from one processor for the commodities program, Hallmark/Westland meats. No products were associated with foodborne illness, yet due to questions raised about procedural compliance during an investigation of humane fabrication processes, the meat was deemed subject to recall (USDA, 2008a)

**History of HACCP**

The HACCP system was developed and utilized to assure high microbiological and sensory quality of food served to astronauts in space (Longree & Armbruster, 1987). This was a cooperative project between the National Aeronautics Space Administration and
Pillsbury Corporation. The system was developed and tested at the Natick Laboratories of the U.S. Army and U.S. Air Force Space Laboratories (USDA-FNS & National School Foodservice Management Institute, 2002). Application of the HACCP processes created food for space programs that approached 100% assurance against contamination by bacterial and viral pathogens, toxins, and physical and chemical hazards (National Food Service Management Institute [NFSMI], 2009). The FDA initiated a mandated HACCP program for low-acid canned foods in the early 1970s after an outbreak of *Clostridium botulism* in canned mushrooms. A hazard can occur during any of these phases: growing, harvesting, processing, manufacturing, distribution, preparation, and serving of food for consumption (NACMCF, 1998). HACCP was designed to prevent problems and unsafe conditions through implementation of principles developed by the NACMCF. Prerequisite programs such as Good Manufacturing Practices are the foundation for the development and implementation of HACCP plans (R. Graviani, personal communication, July 28, 2008). On July 25, 1996, FSIS issued a Pathogen Reduction/HACCP systems rule that focused on the prevention and reduction of microbial pathogens in raw products that can cause illness in meat and poultry processing facilities (USDA-FSIS, 2007). Implementation of HACCP in the estimated 6,500 federally inspected and 2,550 state-inspected meat and poultry (slaughter and processing) plants in the United States took three years, from 1997 until 2000 (USDA-FSIS, 2007). Food safety systems based on HACCP principles also have been mandated for seafood processing plants based on USDA/FDA regulations (NRAEF, 2008). Voluntary implementation of HACCP in healthcare, school foodservice, and commercial food operations had occurred prior to the HACCP mandate with the Child Nutrition and WIC Reauthorization Act of 2004 (USDA-FNS & NFSMI, 2002).
The Child Nutrition and WIC Reauthorization Act of 2004 (P.L. 108-265) instituted many changes in school foodservice operations with a mandated food safety plan based on HACCP principles as one of these changes. With the enactment of this public law, schools became the first sector of the foodservice industry to require a food safety plan based on HACCP principles.

**HACCP and Food Safety Mandates for Schools**

A school food safety program is intended to deliver safer food to children by controlling hazards during the process between receiving and service (USDA-FNS, 2005a). To assist in the development of the school food safety plan based on HACCP principles, a guidance document was created and distributed to school FSDs by USDA-FNS (2005a). The guidance identified the minimum elements to be included in a food safety program (USDA-FNS, 2005a). Contents of the guidance document included information on the requirements and process for development of a written plan for each school site in the district that prepared and/or served meals (USDA, 2005a). The requirements of a school food safety plan were identified: written standard operating procedures (SOPs) for specific categories of tasks and with specific components, documentation of menu items in process category, documentation of critical control points for each process category, identification of monitoring actions, establishment and documentation of corrective actions, identification of recordkeeping forms and processes, and evaluation plan for review of food safety plan. USDA-FNS (2005a) listed the categories of SOPs to include, however sample SOPs for each category were not included. For example, sample SOPs for the identified categories of cleaning and sanitizing, purchasing, and storage of dry goods were missing. USDA’s guidance document refers readers to www.NFSMI.org for final versions of SOPs. Other resources, such as the SNA
and Iowa State University (ISU) Extension are also available to school FSDs. The SNA (2005a) resource, *Keys to Food Safety*, in the operations section of the *School Nutrition University* (SNA, 2011a) includes information about: establishment of a food safety team, development of district operation, assessment of current operations, creating SOPs, sample SOPs, and principles as noted in the USDA guidance document (USDA-FNS, 2005a). ISU Extension resources include the *HACCP Journey in School Foodservice* (a series of eight lesson plans for school foodservice staff; Sneed, Mahoney, & Henroid, 2003), a model school district food safety policy, sample SOPs that have been updated to reflect Food Code 2005 (FDA, 2005), and assessment and monitoring forms that can be used for recordkeeping purposes (ISU Extension, 2006). Many of the ISU Extension resources were developed with grant funding support from USDA. Resources from the NFSMI, which is the research and educational arm for USDA Child Nutrition Programs, contain training materials for instructors, participant materials for FSDs, and standardized quantity recipes with critical control points added. The NFSMI materials were created in cooperation with Kansas State University.

Prior to the requirement for HACCP implementation, there was evidence that school foodservice administrators were aware of the need for food safety plans. In different state and national studies conducted prior to the food safety HACCP policy mandates in 2004, foodservice managers in one study and directors in others were asked their familiarity of knowledge of HACCP and frequency of policies in place. Less than half of the respondents in a national and Iowa schools Youn and Sneed (2003) prerequisite programs study indicated that they had written SOPs for cleaning and sanitizing equipment and facilities (Almanza & Sneed, 2003).
Hwang et al. (2001) conducted a study among school foodservice managers in Indiana schools to identify factors related to HACCP implementation. The majority of responding managers (66.5%) was familiar with HACCP, yet of these, only 22 school operations had a HACCP program in place, although 45% indicated they were interested or would be implementing HACCP in the near future. Youn and Sneed (2002) found 22% of responding FSDs in Iowa were familiar with HACCP. Giampaoli, Cluskey, et al. (2002) found in a national study that 30% of school FSDs reported to have implemented HACCP. Of the 445 schools contacted in the 2006 School Health Policy and Program Study (CDC, 2006c), 71.4% of the schools reportedly had written HACCP-based plans (O’Toole et al., 2007). In another study, the SNA (2008) found that, after the USDA HACCP mandate, only 85% of schools reported HACCP implementation.

**Training**

For a district to be truly successful, staff development should be based on the premise that all school staff must continuously expand their knowledge and skills (Pennsylvania Association of School Business Officials [PASBO], 2002). Benefits of a well-trained and motivated staff are necessary for improved customer service, higher revenues, dedication, and employee retention (PASBO, 2002). Employee retention and dedication also are higher when staff is given the gift of knowledge and tools to perform their job with integrity and expertise (PASBO, 2002).

Training has three key elements: presentation, feedback, and application (NRAEF, 2008). Training sessions targeted to adult learners should include why the training is important, how to perform the task, ability to demonstrate and practice task, and receive feedback (Oakley, 1999). Presentation is the delivery of the content; feedback covers
immediate reinforcement during the practice time or the application. Once the content is presented, the learner must have the opportunity to practice, perform tasks, and apply the skills. The NRAEF (2008) suggested two-thirds of the training time be devoted to application of skills and practice with feedback.

Oakley (1999) noted training of staff led to greater job satisfaction, built program loyalty, and could lead to lower turnover and decreased absenteeism. Staff development and professional training benefits the employee through improved morale and the employer by increasing productivity (Smith & Mazin, 2004). These researchers also noted in a survey conducted by *Fortune* magazine that the best 100 companies to work for reported that annual company sponsored and supported training per employee ranged from 5 to 162 hours. Pannell-Martin (1999) stated the school district “owes it to employees” (p. 127) to provide training opportunities for personal development. During the 2006 School Health Policy and Program Study, 96.3% of the districts surveyed nationally provided some funding for staff development (O’Toole et al., 2007). Investing in staff, whether through funds for support of training or time for in-service training will be returned by greater productivity, higher-quality meals, and improved service to the students (Pannell-Martin, 1999).

Directors of school meal programs are responsible for staff practice of proper hygiene and food safety procedures. Commitment by directors and school administration is essential to influence attitudes and actions of staff to ensure goals of the school foodservice program are met. Although school FSDs believe food safety is important, there is need for additional training and improvements (Giampaoli, Sneed, et al., 2002). These researchers also found school FSDs were positive in their agreement about benefits of continuing education in food safety for themselves and staff but were neutral on spending money and time to certify staff.
Youn and Sneed (2002) also found school FSDs identified a need for continued employee training. Food safety training reduces waste, assists in safe food production, promotes a strong program image, and improves staff retention (Pannell-Martin, 1999).

Professional and noncertified school foodservice staff have the opportunity to join the professional organization of the SNA. Membership benefits of dues-paying members include online course work, mentor programs, networking, hands-on workshops, and training. Some of the training program topics are: purchasing, cost control, marketing, and food safety and sanitation. In 2008, the SNA reported 45% of its members had received certification for 10 hours of sanitation and food safety training as a component of the organization’s certification process.

Training should reach all staff, new and continuing. Employee training has associated costs, such as time away from the kitchen for training, trainer fees, and material or supply expenses. Training programs for new staff should be mandatory and provide the knowledge and skills needed to handle food safely in school kitchens. Current staff might know the correct procedures, yet continual training will reinforce the concept to ensure these are followed. Training should be ongoing, practiced by staff, and monitored by management. There is often a gap between what is required and what is demonstrated (Henroid & Sneed, 2004). Managers should observe staff and provide feedback to overcome the gaps.

**Administrative Program Support**

School foodservice, with interwoven federal, state and local laws and policies, is one of the most complex departments of a school district (Sackin, 2006). School foodservice program administration has many facets. Although it’s operated as a nonprofit, it is also an educational program (J. Martin, 1999b). Programs across the nation are facing challenges of
operating with increased efficiency. It is generally recognized that school meal programs should be self-supporting. Pannell-Martin and Applebaum (1999) observed that school FSDs often are responsible for operational budgets equivalent to a million-dollar business. These operations are accountable to taxpayers and must be managed in compliance with regulations of the legislated program.

School districts have tighter budgets and local school boards are not always willing to cover deficits in school foodservice funds (Cater & Brown, 2002). School foodservice is expected to operate quality programs with high nutrition standards and be financially sound (Cater & Brown, 2002). However, not all programs are self-supporting, as revenues have not kept pace with expenses (Pannell-Martin & Applebaum, 1999). Cho and Nadow (2004) found a successful school meal program needed collaborative efforts of school administration.

Financial crises in school districts has led to school administrators looking at ways to balance the budget and focus on education rather than district services, such as foodservice (Stracener & Boudreaux, 1997). A deficit budget situation siphons money from the district’s general fund and means money is used to balance the foodservice fund rather than buy school books (Smeltz, 2008). The increased pressure on school district budgets decreases the likelihood districts would subsidize meal programs if the meal programs operated at a loss (Stainbrook, 1991). Increases in food, milk, and energy costs, combined with high labor and benefits costs, also have impacted school nutrition program budgets (SNA, 2007; USDA, 2008a). School nutrition programs have continued to struggle with lagging reimbursements, unfunded or underfunded mandates, increased indirect costs, and unpaid student meal changers. According to the SNA (2010) trends report, responding directors anticipated
increases in budgets for food costs (87.6%), labor (63.8%), and indirect costs (55.0%).

Ongoing budget concerns were pressing concerns for districts nationally.

Just as the district provides funding and release time for in-service and professional development to instructional and administrative staff, noninstructional staff, including those working in school foodservice programs, should be provided the same educational opportunities from the same funding source, typically the district’s general fund. Student meal programs are part of the total educational and school environment and help promote healthy behaviors. School foodservice programs provide critical links between learning and achievement. These links are defined as improved attendance (Gunderson, 1971) decreased tardiness, increased test scores (Potts-Datema, 2005), and retention of children in school (J. Martin, 1996). Increased meal participation supports the financial status of the school foodservice program and provides assurance that children are receiving adequate nutrition, thus ensuring academic performance is not compromised. School meal programs need the support of the school district administration to operate as an integral part of the school day.

School business officials are part of the district administration. The SBO has the important function of ensuring school district budgets are balanced (J. Martin, 1996). School administrators need to have an understanding of the complexities of the school foodservice program and be supportive as well as endorse a positive image of the program. School administrators play an important role in policy implementation. They may be unaware of legislation or issues related to policy implementation. Therefore, school FSDs must inform administration of the knowledge of the policy, assess the intent of the support from the administration, and identify concerns related to the policy (Molaison & Carr, 2006). Areas where the SBO can offer support to the school foodservice program include funding and
release time to support training to maintain a strong food safety plan, adequate meals times, facility upkeep, and child nutrition program support.

Examples of demonstrated support for the school foodservice program from district decision makers include providing adequate meal time periods, providing assistance with payment collection methods, setting satisfactory meal prices, providing training funds, setting board-level policies (Strohbehn & Litchfield, 2008), maintaining physical areas, authorizing staff to provide monitoring of children during mealtime, establishing food safety policies (Sneed & Henroid, 2003), and defending the program to various stakeholders (March & Gould, 2002).

Successful implementation of a HACCP program requires a strong commitment from administration or management (NACMCF, 1998). This commitment is reflected in awareness of the benefits and cost of HACCP and include education and training for staff (NACMCF, 1998). Benefits, in addition to assurance of safer foods, are timely response to problems and better use of resources.

As part of an exploratory study to investigate relationships between SBOs support of school meal programs and FSDs perceptions of support with implementation of district HACCP plans, two surveys were developed. Surveys were sent to SBOs and FSDs in one of the USDA regions.
CHAPTER 3. METHODOLOGY

Introduction

The purpose of this study was to determine district support within one USDA geographic region for implementation of a mandated school food safety plan by location where food is prepared or served as presented in the Child Nutrition and Reauthorization Act of 2004 by July 1, 2006. Continental U.S. public school districts in the USDA Mid-Atlantic region with enrollments between 2,500 and 25,000 students were the population for this study ($N = 1,744$) with the exclusion of districts in the District of Columbia, Commonwealth of Puerto Rico, and U.S. Virgin Islands. Although districts in these territories are part of this region, they were not surveyed because they did not meet study restrictions for enrollment size (District of Columbia) and contacting these areas were perceived to be cost prohibitive for any clarification of questions via telephone, as both Puerto Rico and the Virgin Islands are located outside the continental United States.

School FSDs assessed levels of implementation of a mandated school food safety plan in their districts, perceived administrative support, and identification of district’s food safety training efforts were compared with SBOs’ identified knowledge about child nutrition programs and level of support for food safety training and state agency’s role in monitoring and compliance of the reauthorization mandates. A sampling mode of mail surveys was used to gather data from public school FSDs and SBOs in medium-sized districts of the six states that comprise the continental USDA Mid-Atlantic region: Delaware, Maryland, New Jersey, Pennsylvania, Virginia, and West Virginia. Prior to reviewing for content validity and pilot testing of the two surveys created for this study, all data collection instruments and research protocol were reviewed and approved by the ISU’s Office of Research Assurances and
Human Subjects Review Committee (Appendix A). Study population, sampling procedures, data collection tools, and data analysis are described below.

**Study Population**

Medium-sized U.S. public school districts located in the continental USDA Mid-Atlantic region serving grades K through 12 with enrollments between 2,500 and 25,000 students were the target population because they reflect urban, suburban, and city districts. Information gathered from districts in these states represented the majority of districts in the country. According to the SNA (2006), the top 100 school districts in the country by enrollment have enrollments of 45,000 students or greater, representing only 0.6% of the enrollment population nationally. Data from the U.S. Department of Education (Dalton, Sable, & Hoffman, 2006) reflected that, in the 2003–2004 school year, each of the 100 largest districts had an enrollment of at least 46,591 students, with a combined enrollment of 11,280,677, which represented 22.9% of the nation’s enrollment. Districts with enrollments of 2,500–25,000 are more representative of the average school district population. In this study, districts with enrollments of 2,500–25,000 represented about half of the students enrolled in the mid-Atlantic region.

The Mid-Atlantic USDA Region consists of six states. A review of the U.S. Department of Education database and the National Center for Education Statistics ([NCES], 2007) indicated a total of 1,744 school districts in the region, with 498 districts from the six states meeting enrollment parameters described previously (shown in Table 1). The average number of school buildings per district was 10.12, with an average of 577 students per building.
School districts with enrollments of less than 2,499 students represented 69.8% of the population of the districts in the Mid-Atlantic region. Districts in the region with enrollments up to 25,000 students represented 28.56% of the population of the public school districts, whereas the number of districts with 25,001 and more students represented 1.53% of the districts in the Mid-Atlantic region population. In the Mid-Atlantic region, only 0.005%, or 8 of the 1,744 school districts, have more than 100,000 students enrolled. Thus, the proposed enrollment parameter reached approximately one third of the number of public school districts in this USDA region and represent rural, city, and suburban areas. Although districts with enrollments of fewer than 2,500 students do represent the majority of districts in the region, some of these districts consist of vocation–technical schools, nonpublic schools, and regional school districts that comprise only grades K–6, K–8, 7–12, or 9–12. Further, some of these districts may serve student meals but may not participate in the SBP or NSLP. There were 1,744 school districts in the Mid-Atlantic

Table 1

<table>
<thead>
<tr>
<th>State</th>
<th>All school districts</th>
<th>School districts with student enrollment between 2,500 and 25,000</th>
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<tr>
<td>Delaware</td>
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<td>Maryland</td>
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</tr>
<tr>
<td>West Virginia</td>
<td>57</td>
<td>37</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,744</td>
<td>498</td>
</tr>
</tbody>
</table>

aData: Districts in New Jersey are configured as K–5, 6–8, 9–12, and/or K-12.
region, totaling 5,706,192 students in 8,047 buildings. The population selected for this study represented 28.56% of the districts in the region and comprised 51.04% of the student enrollment in the Mid-Atlantic region.

**Sampling Procedures**

All school FSDs and SBOs in districts with student enrollments between 2,500 and 25,000 in the Mid-Atlantic region received a survey. All contact and mailing information for the school FSDs was identified from public school district lists provided by each state’s education agency, personal contacts, and NCES (2007) listings. During 2003–2004, a cohort of ISU Ph.D. students compiled a master list from the NCES (2007), state departments of education, state school foodservice, and personal contacts. This list was further filtered and updated using NCES (2007) data. A list of the names of districts’ SBOs was obtained from each state’s department of education and matched with the school foodservice names and schools. The postal surveys for SBOs were mailed jointly with the school FSDs’ survey packet. Because Dillman (2007) stated a personal letter leads to a greater survey return response, every effort was made to include a survey cover letter with the recipient’s name and address. The recipient’s name and address was printed on a label affixed to the cover letter. Surveys addressed to the school district FSD and the SBOs in the entire population of districts that met enrollment criteria were mailed jointly under separate cover. All data were treated confidentially; no district name was placed on the survey. Identification numbers placed on the lower right corner of the last page of each survey were used to track responses and removed once data entry was complete. Respondents were asked to include with the return of the survey a business card, which was separated from the completed survey upon
receipt, if they desired a copy of the results. Each state has an agency director, and each was
invited to participate.

**Content Validity**

Two expert panels reviewed the FSD and SBO surveys for content validity. The
expert panels consisted of school FSDs employed outside the Mid-Atlantic region, members
of the Child Nutrition Academy (ISU classmates) with expertise in research design, and five
graduate SBO students in New Jersey. All comments were reviewed, and the content of the
surveys were revised as needed for the pilot testing. A letter and evaluation form was
developed for FSDs and SBOs (Appendices B, C, D and E).

**Pilot Testing**

Eight school FSDs and their district SBOs were selected randomly from districts with
enrollments of 2,500 to 25,000 serving school meals to grades K–12 in six other USDA
geographic regions (Northeast, Midwest, Southeast, Southwest, Mountain Plains, and
Western; \(N = 96\)). These directors and SBOs were asked to pilot test the appropriate survey
for clarity and estimate the time needed for completion. Two pilot test districts were selected
randomly from each of the following enrollment ranges per region: 2,500–5,000, 5,001–
7,500, 7,501–10,000, and 10,001–25,000. These selections of districts by enrollment had
equal number of districts within each enrollment range. An evaluation matrix was provided
to each member to complete and return via postal mail to the researcher. For convenience,
the districts identified in the pilot test were sent both a FSD and SBO survey and the FSD
collected the evaluation form (Appendices F, G, H and I) and returned it to the researcher.

Distribution of the 60 surveys were as follows to mirror enrollment categories within
the Mid-Atlantic region: 32 survey sets to districts with enrollments of 2,500–7,500, 19
survey sets to districts with enrollments of 7,500–15,000, and 21 survey sets to districts with 15,001–25,000. Eight FSDs returned complete usable surveys and 14 returned partially completed surveys for a total of 22 surveys responses from FSDs. Two SBOs returned complete surveys and 10 returned partially completed for a total of 14 SBO surveys. Surveys were received from at least one FSD and SBO from districts in each category of enrollment, and responses were received from five of the six regions. As a result of the comments from those participating in pilot test, modifications were made to the format of the questions in the survey prior to distribution.

Data Collection Procedures

School Foodservice Directors

In November, the survey packets were sent to school FSDs (N = 498) in all districts meeting enrollment criteria in each of the six states in the Mid-Atlantic region. They were asked to distribute the survey to the SBO in their districts. The survey packets consisted of instructions and color-coded survey, printed on six, 24-pound, high quality, 11” x 17”, different-colored (blue, ivory, white, tan, gray, and salmon) paper for both the FSD and the SBO. First class postage was affixed to self-addressed return envelopes and interior sealing envelopes for the SBO survey. In an effort to maximize the response rate, a presurvey note is one strategy to encourage a higher rate of survey response (Creswell, 2005; Groves et al., 2004). Participants had been contacted previously by an introductory presurvey postcard asking for their participation in the mail survey (Appendix J). The list of districts meeting enrollment criteria was based on the available information from a compilation of databases including those from state agencies, personal contacts, and the NCES (2007). Multiple follow-up procedures also were used (Creswell, 2005; Dillman, 2007). Utilizing Dillman’s
(2007) protocol for increasing response rates of mail surveys, the following procedure was used to distribute mail surveys:

Day 1: A presurvey post card was sent (Appendices J and K).

Day 4: A personalized cover letter with a copy of the instructions, survey, deadline date of 2 weeks, a self-addressed stamped reply envelope and a SBO packet containing a personalized cover letter with a copy of the instructions, survey, and a sealing envelope was sent to the mail list of FSDs (Appendices L, M, N, and O).

Day 20: A second postcard was sent to FSDs as a reminder notice for nonrespondents and as a thank you for those who had responded (Appendices P and Q).

Day 30: A second cover letter, instructions, survey, and self-addressed reply envelope was sent to nonrespondents (Appendices R and S).

Day 31: A follow up e-mail or phone call was made to half of the FSDs using a script to urge response to the mail survey and to ensure equal representation from each state in the region. If requested, a third cover letter set of instructions, survey, and self-addressed reply envelope was sent via postal mail or fax (Appendices L, M, N, and O). Previous regional and national surveys using electronic and mail methods to the FSD population have resulted in response rates ranging from 21–39% (D. Schweitzer, personal communication, July 21, 2008; E. Hanna, personal communication, July 28, 2008; B. W. Rice, personal communication, July 21, 2008; K. Wilson, personal communication, March 12, 2008).
School Business Officials

The survey packet sent to the FSDs included a packet for the SBO in the district \(N = 498\). The cover letter for the SBO packet of materials was personalized when possible.

State Agency Directors

A cover letter and copy of the survey questions were sent to state agency directors in the Mid-Atlantic region \(N = 6\). The cover letter for each state agency director was personalized when possible.

Data Collection Tools

School Foodservice Directors Survey

The mail survey developed for FSDs consisted of eight content sections: (a) school district policies, (b) completeness and use of the district’s food safety plan, (c) foodservice staff, (d) sanitation inspections, (e) district support for food safety, (f) attitudes toward food safety training, (g) personal food safety beliefs and practices, and (h) demographic information. In the first section, participants assessed their perceptions of the importance of district board-level policies related to food safety on eight questions using a 5-point Likert-type rating scales ranging from 5 (very important) to 1 (very unimportant), two forced choice options to assess district board-level policies supporting safe food practices, and one forced choice checklist identifying factors that would influence district administration support for funding for school foodservice training. In the second section, a list of 11 SOPs identified from the USDA guidance document (USDA-FNS 2005a) was presented and participants were asked to assess level of implementation of SOPs as part of the district’s food safety plan. Participants used 5-point Likert-type rating scales with definitions of level of completeness of implementation ranging from 1 (not started) to 5 (complete) that addressed
the presence of SOPs such as inclusion of elements specified in the USDA guidance
document (USDA-FNS, 2005) and documentation procedures as defined by the USDA
guidance document. In this section, a forced choice checklist with “yes” or “no” options to
identify whether documentation was used to monitor these SOPs and the presence of other
records kept as part of the district’s food safety plan was also included. In the third section,
five questions about foodservice staff were posed with a forced choice response option of
either “yes” or “no.” Questions addressed food safety concepts that occurred during the
hiring and orientation processes and the presence of these concepts in employee task lists, job
descriptions, and performance appraisal documents. In the fourth section, directors were
asked the frequency of written inspections reports and inspection fees with three forced
choice questions. A branching question about inspection fees was also included. Multiple
choice response options were given for questions about posting the location of written
inspections reports and the frequency of requests for written inspections reports. Four
questions regarding the number of foodservice sites in the district receiving inspections,
identification if the sites receiving any critical violations, and a listing of these critical
violations and defined corrective actions used open-ended choice answers. In the fifth
section, participants were asked about their perceptions of district support from school
administration on 17 questions using a 5-point Likert-type rating scale ranging from 1 (very
unsupportive) to 5 (very supportive). In the sixth section, respondents were asked about their
attitudes toward food safety training on three questions and their personal food safety beliefs
on four questions using a 5-point Likert-type rating scale ranging from 1 (strongly disagree)
to 5 (strongly agree). Forced choice response options were listed for 21 questions about
training and content areas of training. In the seventh section of the survey, participants
assessed their personal safety practices away from the district with eight questions having
response options of “yes” or “no” or having a 5-point Likert-type rating scale ranging from 1
(strongly disagree) to 5 (strongly agree) and one forced choice question. The same response
options were used to address personal shopping, storage, and preparation practices on 29
questions. In the eighth section of the survey, 22 open-ended, “yes” or “no,” forced choice,
and multiple choice questions were used to determine personal characteristics of the school
FSD (such as age, gender, educational level, years of service, membership, certification, and
credentialled) and his/her district characteristics (enrollment, production systems, number of
staff, percentage of need, budget, and independent operations verses contracted operations).
A copy of the survey is in Appendix M.

School Business Officials Survey

The survey for the districts’ SBOs consisted of four sections: (a) school district
policies, (b) knowledge and attitudes about food safety, (c) district’s support of training for
foodservice staff and overall support for district foodservice programs, and (d) demographic
information. Eighteen items in the policy section were the same as those developed for
school FSD questionnaire to allow for comparisons between the SBOs’ and the FSDs’
responses. In the second section, the SBOs were asked one question to rate his/her
knowledge of P.L. 108-265 using a Likert-type rating scale ranging from 1 (no knowledge)
and 5 (very familiar) and three questions using a forced choice checklist to identify how they
learned of the law and elements of the school food safety plan. In the third section, 18
multiple choice and open-ended questions about foodservice staff training, such as the
number of training programs attended, number of foodservice staff supported, amount of
dollars spent by the district, number of training hours for noninstructional staff for school
years 2007 – 2008, and district account source of funding (i.e., general fund or foodservice program account) were posed. In the last section, the SBO was asked through 13 multiple choice questions to provide information about personal and district characteristics in the demographic section. A copy of the survey is in Appendix O.

**State Agency Survey**

The survey for the state agency consisted of two sections with 13 open-ended questions. Questions were asked either on the phone or via e-mail. Topics included the current food code adopted by each state, HACCP policy mandates prior to P.L. 108-265, the review process of food safety plans by the state agency, standard forms used for sanitation inspections, the frequency of the health inspections statewide, and an estimate of how many districts have implemented the food safety plan. The final question asked for any additional information the agency director wanted to share. A copy of the survey is in Appendix U.

**Data Analysis**

Descriptive statistics, correlations, *t* tests, and analysis of variance were used. A Bonferroni post hoc analysis was run to compare differences by personal variables. Negatively phrased items were reverse coded on the scales. School district variables included enrollment, type of production system, number of staff, percentage of children qualifying for free or reduced-price meals, budget, and self-operated versus contract management. Personal characteristic variables of the FSDs and SBOs included age, gender, educational level, years of service, membership, and certification and credentialed.
CHAPTER 4. RESULTS AND DISCUSSION

Introduction

The purpose of this study was to determine school districts’ support within one USDA geographic region for implementation of a mandated school food safety policy presented in the Child Nutrition and Reauthorization Act of 2004. The FSDs and SBOs in public school districts located in the continental USDA Mid-Atlantic region with enrollments between 2,500 and 25,000 students were the population for this study (N = 1,744). Paper-and-pencil surveys were sent via U.S. Postal Service to all school FSDs and their SBOs in the study population.

School FSDs’ assessed level of implementation of a mandated school food safety plan in their districts, perceived administrative support, and identification of the district’s food safety training efforts were compared with SBOs’ identified levels of support for food safety training and the child nutrition program. Mail surveys were used to gather data from a sample (n = 498) of K–12 public schools. FSDs and SBOs in the six states that comprise the continental USDA Mid-Atlantic region (Delaware, Maryland, New Jersey, Pennsylvania, Virginia, and West Virginia) were included in this study. Surveys were validated for content by an expert panel and pilot tested prior to distribution to the population. All data collection instruments and research protocol were reviewed and approved by ISU’s Office of Research Assurances and Human Subjects Review Committee (Appendix A).

The paper-and-pencil survey packets were sent to the school FSDs (n = 498) in all districts of the six states in the Mid-Atlantic region meeting enrollment criteria between 2,500 and 25,000. The FSDs were asked to distribute the survey to the SBO in their districts. Responses from both groups broken down by states within the region are shown in Table 2.
The total response for the returned surveys was 277 with all states in the Mid-Atlantic region represented. Of this total, the total number of FSD surveys was 176 (35.3%) and the total number of SBO surveys was 101 (20.3%). Usable surveys were received from 33.3% \((n = 166)\) of the FSDs and a little less than 18.3% \((n = 91)\) of the SBOs. Any survey that was returned blank was termed unusable, and if an answer was entered into the wrong response block or line the item was deemed unusable. Over 17% \((n = 85)\) of the FSD and SBO respondents returned paired surveys. With the exception of a few questions, missing responses were recoded to 999 as item nonresponse to avoid assuming the number was zero. The missing data were not configured in the analysis. The SBO section with the least responses was information requested on staff hours and training hours by staff classification.

Table 2

<table>
<thead>
<tr>
<th>State</th>
<th>Districts that sent surveys</th>
<th>FSD</th>
<th>SBO</th>
<th>Usable surveys</th>
<th>FSD</th>
<th>SBO</th>
<th>FSD/SBO paired responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>%</td>
<td>(n)</td>
<td>%</td>
<td>(n)</td>
<td>%</td>
<td>(n)</td>
</tr>
<tr>
<td>Delaware</td>
<td>13</td>
<td>2.6</td>
<td>9</td>
<td>5.1</td>
<td>3</td>
<td>3.0</td>
<td>8</td>
</tr>
<tr>
<td>Maryland</td>
<td>13</td>
<td>2.6</td>
<td>8</td>
<td>4.5</td>
<td>6</td>
<td>5.9</td>
<td>7</td>
</tr>
<tr>
<td>West Virginia</td>
<td>37</td>
<td>7.4</td>
<td>13</td>
<td>7.4</td>
<td>9</td>
<td>8.9</td>
<td>13</td>
</tr>
<tr>
<td>Virginia</td>
<td>76</td>
<td>15.3</td>
<td>24</td>
<td>13.6</td>
<td>19</td>
<td>18.8</td>
<td>19</td>
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<tr>
<td>New Jersey</td>
<td>131</td>
<td>26.3</td>
<td>32</td>
<td>18.2</td>
<td>11</td>
<td>10.9</td>
<td>31</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>228</td>
<td>45.8</td>
<td>90</td>
<td>51.1</td>
<td>53</td>
<td>52.5</td>
<td>88</td>
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<tr>
<td>TOTAL</td>
<td>498</td>
<td>176</td>
<td>35.3</td>
<td>101</td>
<td>20.3</td>
<td>166</td>
<td>33.3</td>
</tr>
</tbody>
</table>

Note. FSD = Foodservice Director; SBO = School Business Official.
Findings from the survey are presented in the following order: demographic characteristics of responding districts’ school FSDs, district characteristics as reported by the school FSD, demographic characteristics of responding districts’ SBOs, district characteristics as reported by the SBOs, perceptions about board-level policies, SBOs’ knowledge of food safety policy, professional development information, completeness of districts’ food safety plans, foodservice staff characteristics, sanitation inspection reporting, perceptions of district administrative support for the school meal program, school FSDs’ attitudes toward food safety training, school FSDs’ personal food safety practices, and state agency-reported information.

**Demographic Characteristics of School Foodservice Directors**

**Respondents**

Demographic characteristics of the FSD respondents are described in Table 3. A total of 166 (33.3%) completed usable surveys were received. Over 87.3% (n = 145) of the respondents reported their titles as FSD/child nutrition director, supervisor, or area manager. These positions oversee all aspects of school foodservice. This is higher than the 68.8% reported by Story (2008) but lower than the 95% reported by Hanna (2008). The responding FSDs were primarily female (62.0%), lower than the 79.9% reported by Hanna, the 85.9% reported by Story, the 88.2% reported by Thornton (2007), and the 88.3% reported by Stinson, Carr, Nettles, and Johnson (2011) in other studies of child nutrition professionals. Close to two-thirds 62.7% (n = 104) of the respondents had completed a 4-year degree; of these 19.3% held advanced degrees. Those respondents with 4-year degrees reflected a higher percentage than the 41% reported by O’Toole et al. (2007), the 46.5% reported by Hanna and Stinson et al., and the 32.2% identified by Thornton. The percentage of study
Table 3

*Characteristics of School Foodservice Director Respondents in the Mid-Atlantic Region*

(N = 166)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Official title</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foodservice director/child nutrition director</td>
<td>133</td>
<td>80.12</td>
</tr>
<tr>
<td>Foodservice supervisor</td>
<td>1</td>
<td>0.60</td>
</tr>
<tr>
<td>Area manager</td>
<td>11</td>
<td>6.63</td>
</tr>
<tr>
<td>Coordinator</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Specialist</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Admin-assistant-operations</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>School kitchen manager</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Cook/manager</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>School business official</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>7.83</td>
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<tr>
<td>No response</td>
<td>8</td>
<td>4.82</td>
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<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school diploma</td>
<td>17</td>
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</tr>
<tr>
<td>Some college</td>
<td>14</td>
<td>8.43</td>
</tr>
<tr>
<td>Associate degree</td>
<td>24</td>
<td>14.46</td>
</tr>
<tr>
<td>Bachelor degree</td>
<td>50</td>
<td>30.12</td>
</tr>
<tr>
<td>Some graduate work</td>
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<td>13.25</td>
</tr>
<tr>
<td>Graduate degree</td>
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<td>18.07</td>
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<tr>
<td>Doctoral degree</td>
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<td>1.20</td>
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<td>4.22</td>
</tr>
<tr>
<td><strong>School Nutrition Association membership type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Director</td>
<td>110</td>
<td>66.27</td>
</tr>
<tr>
<td>Manager</td>
<td>5</td>
<td>3.01</td>
</tr>
<tr>
<td>Major city</td>
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<td>1.20</td>
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<tr>
<td>Educator</td>
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<td>0.00</td>
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<tr>
<td>I am not a member</td>
<td>41</td>
<td>24.70</td>
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<tr>
<td>No response</td>
<td>8</td>
<td>4.82</td>
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<tr>
<td><strong>Credentialed School Nutrition Specialist</strong></td>
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</tr>
<tr>
<td>Yes</td>
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<tr>
<td>No</td>
<td>131</td>
<td>78.92</td>
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<td>No response</td>
<td>12</td>
<td>7.22</td>
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<tr>
<td><strong>Other credentials</strong></td>
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<td></td>
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<tr>
<td>Diet Tech</td>
<td>7</td>
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<tr>
<td>Registered Dietitian</td>
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<tr>
<td>Certified Dietary Manager</td>
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<tr>
<td>ServSafe&lt;sup&gt;®&lt;/sup&gt; certified</td>
<td>125</td>
<td>75.30</td>
</tr>
<tr>
<td>State/county agency food handler’s certificate</td>
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<td>30.73</td>
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<tr>
<td>Dietary manager’s food safety program</td>
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<tr>
<td>NEHA certified</td>
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<tr>
<td>SNA certified</td>
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<td>Other</td>
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<td>9.64</td>
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Table 3 (continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>$n$</th>
<th>%</th>
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<tbody>
<tr>
<td><strong>Years in current position</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>14</td>
<td>8.43</td>
</tr>
<tr>
<td>1-5 years</td>
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<td>29.52</td>
</tr>
<tr>
<td>6-10 years</td>
<td>38</td>
<td>22.89</td>
</tr>
<tr>
<td>11-15 years</td>
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<td>10.84</td>
</tr>
<tr>
<td>16-20 years</td>
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<td>11.45</td>
</tr>
<tr>
<td>21 years or more</td>
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<td>11.45</td>
</tr>
<tr>
<td>No response</td>
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<td>5.42</td>
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<tr>
<td><strong>Total years in foodservice industry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
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<td>0</td>
</tr>
<tr>
<td>1-5 years</td>
<td>9</td>
<td>5.42</td>
</tr>
<tr>
<td>6-10 years</td>
<td>15</td>
<td>9.04</td>
</tr>
<tr>
<td>11-15 years</td>
<td>10</td>
<td>6.02</td>
</tr>
<tr>
<td>16-20 years</td>
<td>28</td>
<td>16.87</td>
</tr>
<tr>
<td>21 years or more</td>
<td>97</td>
<td>58.43</td>
</tr>
<tr>
<td>No response</td>
<td>7</td>
<td>4.22</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
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</tr>
<tr>
<td>Male</td>
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<td><strong>Age</strong></td>
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<td>67 or more</td>
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<td>0.60</td>
</tr>
<tr>
<td>No response</td>
<td>8</td>
<td>4.82</td>
</tr>
</tbody>
</table>

*a*Foodservice directors reported holding multiple credentials.

Respondents holding advanced degrees was slightly lower than the 21.0% reported by Hanna, the 26.6% by Story, and much lower than the 45.7% found by Thornton. The level of education held by FSDs in this study is consistent with prior reports, and is a positive for district FSDs, as Conklin (2008) noted that because school systems and administrations value continuing education, professional development, and formal education, FSDs should continue to pursue advanced education and certification.
The highest percentage (41.6%) of respondents was between the ages of 46 and 55 years. The majority of FSDs (58.4%) had a total of 21 or more years of foodservice industry experience. However, 63 (38.4%) of the 166 respondents had been in their current director’s position for 5 years or fewer and 56 (33.7%) of the directors had held the position for 6 to 15 years. These findings are similar to previous work by Stinson et al. (2011), who reported about one third (31.5%) of the respondents in their study were fairly new to their positions with only 1 to 5 years of experience as the director, and Hanna’s (2008) findings, which indicated that close to half (43.5%) of the respondents had been directors for 6 to 15 years.

Professional Credentials

Of the 166 FSD respondents, 117 (70.5%) indicated they were members of the SNA, which is a lower percentage than Thornton’s (2007) findings of 89.5% membership held by FSDs in her survey. The SNA is the professional organization for child nutrition professionals and offers professional development opportunities leading to levels of certification followed by the SNA credential. Certification requirements include 10 hours of food safety training. The School Nutrition Specialist (SNS) credential holds a higher standard for certification, includes a national exam based on defined competencies, and offers increased recognition to the FSD. Less than one fourth (21.1%) of the respondents in this study also reported being certified by SNA; however only 13.9% had earned the SNS credential. This finding is similar to that of Stinson et al. (2011), who found 16.2% of respondents in their study were credentialed, but considerably less than Thornton’s finding of 27.3%, Story’s (2008) finding of 32.9%, and Brounstein’s (2003) finding of 46.0%, although the latter study surveyed only a single state from the Mid-Atlantic region. Conklin, Sneed, and Martin (1995) found a positive relationship between years of experience for FSDs and
holding of SNS credentials. As years of experience increased, so did the tendency to hold the SNS certification (48%). However, the reverse was found with directors having less than 5 years of experience, as only 23% held the SNS certification.

The majority (75.3%) of FSDs in this study reported holding ServSafe® certification, and 30.7% reported holding a state or county food handler’s certificate. Thus, almost all respondents indicated at least some type of certification in food safety was held. This is very similar to findings reported by Story (2008) for food safety certification. In her study, over 79.7% held a national food safety certificate such as ServSafe®, whereas Stinson et al. (2011) reported a lower rate (63.9%) of certification.

**School District Characteristics as Reported by School Foodservice Directors**

**Districts**

School district characteristics as reported by the FSDs are described in Table 4. The majority of the districts were suburban (44.6%), with an average enrollment of 5,991 students, and reported average free and reduced participation of 31.5%. Responding FSDs posted expenditure budgets ranging from less than $1 million to in excess of $12 million. Close to 47.6% of the budgets were for amounts of $1.9 million or less, which is higher than the average budget of $1.5 million reported in the *SNA 2009 Operations Report* (SNA, 2009). About three-fourths (72.9%) of the responding school foodservice programs were self-operated. This is lower than the 86.2% reported by Hanna (2008), the 93.5% reported by Story (2008), and the 97.3% found by SNA (2011c). District FSDs responded as participating in federal child nutrition SBP and NSLP (90.1% and 99.4%, respectively). Respondents in this study reported only 41.38% of their districts had after-school programs, which is lower than 48.4% and 64.5% reported by both Hanna and Thornton (2007),
### Table 4

**School District Characteristics as Reported by School Foodservice Director in the Mid-Atlantic Region (N = 166)**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>District type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>19</td>
<td>11.45</td>
</tr>
<tr>
<td>Suburban</td>
<td>74</td>
<td>44.58</td>
</tr>
<tr>
<td>Rural</td>
<td>63</td>
<td>37.95</td>
</tr>
<tr>
<td>No response</td>
<td>10</td>
<td>6.02</td>
</tr>
<tr>
<td><strong>Budget expenditure for 2007–2008 school year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $1,000,000</td>
<td>13</td>
<td>7.83</td>
</tr>
<tr>
<td>$1,000,000 to 1,999,999</td>
<td>66</td>
<td>39.76</td>
</tr>
<tr>
<td>$2,000,000 to 2,999,999</td>
<td>36</td>
<td>21.69</td>
</tr>
<tr>
<td>$3,000,000 to 3,999,999</td>
<td>12</td>
<td>7.23</td>
</tr>
<tr>
<td>$4,000,000 to 4,999,999</td>
<td>12</td>
<td>7.23</td>
</tr>
<tr>
<td>$5,000,000 or &gt;</td>
<td>11</td>
<td>6.63</td>
</tr>
<tr>
<td>No response</td>
<td>16</td>
<td>9.63</td>
</tr>
<tr>
<td><strong>Management of program</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract managed</td>
<td>39</td>
<td>23.49</td>
</tr>
<tr>
<td>Self-operated</td>
<td>121</td>
<td>72.90</td>
</tr>
<tr>
<td>No response</td>
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<tr>
<td><strong>Federal programs</strong></td>
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<td></td>
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<tr>
<td>School Breakfast Program (n = 151)</td>
<td>136</td>
<td>90.07</td>
</tr>
<tr>
<td>National School Lunch Program (n = 156)</td>
<td>155</td>
<td>99.36</td>
</tr>
<tr>
<td>After School Snack Program (n = 116)</td>
<td>48</td>
<td>41.38</td>
</tr>
<tr>
<td>Fresh Fruit and Vegetable Program (n = 100)</td>
<td>13</td>
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</tr>
<tr>
<td>Special Milk Program (n = 156)</td>
<td>21</td>
<td>19.8</td>
</tr>
<tr>
<td>Summer Foodservice Program (n = 106)</td>
<td>40</td>
<td>37.00</td>
</tr>
<tr>
<td><strong>Other programs</strong></td>
<td></td>
<td></td>
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<tr>
<td>Catering</td>
<td>122</td>
<td>82.40</td>
</tr>
<tr>
<td>Vending</td>
<td>91</td>
<td>67.90</td>
</tr>
<tr>
<td>Day Care/Head Start</td>
<td>51</td>
<td>44.00</td>
</tr>
<tr>
<td><strong>Production method</strong></td>
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<td></td>
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<tr>
<td>Conventional</td>
<td>148</td>
<td>89.16</td>
</tr>
<tr>
<td>Commissary</td>
<td>14</td>
<td>8.44</td>
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<tr>
<td>Base kitchen</td>
<td>48</td>
<td>28.92</td>
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<td>Satellite kitchen</td>
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<td>30.12</td>
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<tr>
<td><strong>Serving method</strong></td>
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<td></td>
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<tr>
<td>Food court</td>
<td>56</td>
<td>33.73</td>
</tr>
<tr>
<td>Kiosk</td>
<td>9</td>
<td>5.42</td>
</tr>
<tr>
<td>Grab and go</td>
<td>87</td>
<td>52.41</td>
</tr>
<tr>
<td>Self-serve</td>
<td>87</td>
<td>52.41</td>
</tr>
<tr>
<td>Traditional</td>
<td>135</td>
<td>81.33</td>
</tr>
<tr>
<td>Breakfast in the classroom</td>
<td>38</td>
<td>22.89</td>
</tr>
<tr>
<td>Breakfast in a bag</td>
<td>35</td>
<td>21.18</td>
</tr>
<tr>
<td>Breakfast on the school bus</td>
<td>1</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Table 4 (continued)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food safety certified required of FSD by local health department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>82</td>
<td>49.40</td>
</tr>
<tr>
<td>No</td>
<td>74</td>
<td>44.58</td>
</tr>
<tr>
<td>No response</td>
<td>10</td>
<td>6.02</td>
</tr>
<tr>
<td>Food safety certified required of FSD by school district</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>63</td>
<td>37.95</td>
</tr>
<tr>
<td>No</td>
<td>94</td>
<td>56.63</td>
</tr>
<tr>
<td>No response</td>
<td>9</td>
<td>5.42</td>
</tr>
<tr>
<td>Food safety certified by approved Conference of Food Protection designation required of kitchen managers by school district</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>56</td>
<td>33.73</td>
</tr>
<tr>
<td>No</td>
<td>97</td>
<td>58.44</td>
</tr>
<tr>
<td>No response</td>
<td>13</td>
<td>7.83</td>
</tr>
<tr>
<td>Food safety certified required of all kitchen staff by school district</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30</td>
<td>18.07</td>
</tr>
<tr>
<td>No</td>
<td>125</td>
<td>75.30</td>
</tr>
<tr>
<td>No response</td>
<td>11</td>
<td>6.63</td>
</tr>
</tbody>
</table>

*Some districts reported more than one production method. aSome districts reported more than one serving method.

respectively. Fresh fruit and vegetable programs were reported by less than 13.0% of the districts in this study, lower than the 31.8% reported by Hanna. Other programs reported by the FSDs as operated in their districts were catering (82.4%), vending (67.9%), and daycare/head start (44.0%).

Production Method and Service

The most commonly utilized production method was a conventional system (Unklesbay et al., 1977) in which food is prepared in a full production kitchen and served on site (89.16%), very similar to Stinson et al.’s (2011) findings of 88.1% but lower than the 92.3% reported by SNA(2011c). This system offers greater flexibility in food preparation with more emphasis on batch cooking and less on cook-and-hold, thus decreasing holding
time and increasing freshness of products (Gregoire & Bender, 1999). Limitations of this production system include increased labor hours, availability of adequate space and equipment, and food safety concerns. Hanna (2008) found 93.3% of the 534 respondents in her survey of districts with 2,500 to 10,000 student enrollments indicated conventional systems were the most often used method of production. The use of base kitchens was reported by 28.9% of respondents in this study, slightly higher than Stinson et al.’s findings of 25.5%. Satellite kitchens were reported as being used by 30.1% of FSDs in this study, slightly higher than Stinson et al.’s findings of 24.8% and Hanna’s findings of 27.1%, and considerably higher than SNA’s (2008) reported use of this production type kitchen at 11%. The literature review and findings from this study illustrate how districts will combine production systems, such as conventional production at some school buildings and satellite kitchens at others.

Over 93.4% of the districts responding had implemented offer verses serve, which is designed to increase choices of students and decrease plate waste. Districts indicated types of service methods used with multiple responses. Traditional serving method was reported as used most often in the district (81.3%); these findings are consistent with those noted by SNA in 2008, as well as by Hanna (2008). In the traditional serving method, staff serves thus controlling portions of all menu items listed as a reimbursable meal to the student. This method is more common among elementary schools than in high schools, where offer versus serve is required to be an option. However, both self-service and grab-and-go serving systems (each identified by 52.41% of responding FSDs as used in their districts) were also used methods of service. Use of self-service and grab-and-go serving methods, in which
students personalize their selections, may resemble a trend to replicating retail operations. Hanna found use of these methods by 27.1% of her respondents.

**Health Department Food Safety Certification**

Almost half of responding FSDs (44.6%) indicated they were not required by their local health departments to be food safety certified; even fewer (38.0%) were required by their districts. This finding differs from the *SNA 2009 Operations Report* (SNA, 2009), which identified 65.9% of districts reported their state, local, or district health department required certification in food safety for the “person in charge,” and the *SNA 2011 Operations Report* (SNA, 2011c), which reported a higher percentage (72.9%) of districts noting requirements. Recent versions of the food code require the person in charge to demonstrate knowledge about safe food handling and cleaning and sanitizing practices. Food safety certification is one way this knowledge can be documented. Thus, as more states adopt more recent versions of the food code, increases in districts requiring certification can be expected.

In the *SNA 2009 Operations Report* (SNA, 2009), it was noted that in 87% of schools foodservice staff received basic food-safety training before handling, preparing, or serving food. In the 2009 SNA study, 65.9% of the kitchen managers were required to have food safety certification in their districts, a decrease from the prior study’s (SNA, 2007) percentage of 70.8%. Yet, only 18.1% of districts required certification for all kitchen staff, and training requirements reported in a 2002 study by Youn and Sneed found only 14% of the districts surveyed, had more than 75% of employees certified in food safety. Training may be occurring by districts, as noted by the SNA reports, but certification or documentation of food safety knowledge is not a widespread requirement among foodservice staff.
Demographic Characteristics of School Business Officials

Demographic characteristics of the SBO respondents are described in Table 5. A total of 91 (18.3%) SBOs from districts in the Mid-Atlantic region responded with complete and usable surveys. The majority (92.1%, \( n = 81 \)) of the SBO respondents had completed a 4-year college degree and, of those, almost half (48.9%) held advanced degrees. Of the 91 respondents, almost half (46.6%, \( n = 41 \)) indicated they were fairly new to their current positions, having been in this position for a period from less than 1 to 5 years. Yet, responding SBOs did have experience in school administration, as 88.8% (\( n = 77 \)) reported 6 years or more of experience and 28.4% (\( n = 25 \)) indicated 21 years or more of tenure. Less than half (42.0%) had held other school positions; the majority of these previously held positions were primarily in business-related areas such as SBO/SBO assistant, auditor or accountant, school administration, and teaching. Sixty-three of the SBO held prior business administrative positions in nonschool entities outside of education. The majority of SBOs held membership in professional state organizations (86.4%), with about a third (34.1%) holding membership at the national or international levels.

School District Characteristics as Reported by School Business Officials

Districts

Three-fourths (75.0%) of the SBO survey respondents indicated their districts had self-operated school foodservice programs. District characteristics of the SBO respondents are described in Table 6. Rice (2007) found fewer self-operated school foodservice programs (66.7%) in her national study than did Hanna (2008) and Story (2008), who reported a higher percentage of respondents were part of self-operated school foodservice programs (86.2%
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
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<tr>
<td><strong>Level of education</strong></td>
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<tr>
<td>High school diploma</td>
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<td>Some college</td>
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<tr>
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<td>5.68</td>
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<tr>
<td>Bachelor degree</td>
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<td>29.55</td>
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<td>Some graduate work</td>
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<td>Graduate degree</td>
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<td>Doctoral degree</td>
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<td>6.82</td>
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<tr>
<td>Other</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>1.14</td>
</tr>
<tr>
<td><strong>Years in current position</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>11</td>
<td>12.50</td>
</tr>
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<td>1–5 years</td>
<td>30</td>
<td>34.09</td>
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<tr>
<td>6–10 years</td>
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<tr>
<td>16–20 years</td>
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<td>21 years or more</td>
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<td>13.64</td>
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<tr>
<td>No response</td>
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<td>1.14</td>
</tr>
<tr>
<td><strong>Years of experience in school business administration</strong></td>
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<tr>
<td>Less than 1 year</td>
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<td>3.41</td>
</tr>
<tr>
<td>1–5 years</td>
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<td>6.82</td>
</tr>
<tr>
<td>6–10 years</td>
<td>18</td>
<td>20.45</td>
</tr>
<tr>
<td>11–15 years</td>
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<tr>
<td>16–20 years</td>
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<td>14.77</td>
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<td>28.41</td>
</tr>
<tr>
<td>No response</td>
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<td>2.27</td>
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<td><strong>Years of experience in business administration in nonschool entities</strong></td>
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<tr>
<td>Less than 1 year</td>
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<td>7.95</td>
</tr>
<tr>
<td>1–5 years</td>
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<td>6–10 years</td>
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<td>14.77</td>
</tr>
<tr>
<td>11–15 years</td>
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<td>11.36</td>
</tr>
<tr>
<td>16–20 years</td>
<td>7</td>
<td>7.95</td>
</tr>
<tr>
<td>21 years or more</td>
<td>8</td>
<td>9.09</td>
</tr>
<tr>
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<td>27.27</td>
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<tr>
<td><strong>Prior school-related positions</strong></td>
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<td>Yes</td>
<td>37</td>
<td>42.05</td>
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<tr>
<td>No</td>
<td>50</td>
<td>56.82</td>
</tr>
<tr>
<td>No response</td>
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<td>1.14</td>
</tr>
<tr>
<td><strong>Membership in state school business official organization</strong></td>
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<tr>
<td>Yes</td>
<td>76</td>
<td>86.36</td>
</tr>
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<td>12</td>
<td>13.64</td>
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<tr>
<td>No response</td>
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<td>0.00</td>
</tr>
<tr>
<td><strong>Membership in school business official national/international organization</strong></td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>30</td>
<td>34.09</td>
</tr>
<tr>
<td>No</td>
<td>57</td>
<td>64.77</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>1.14</td>
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</table>
Table 6

Charactersistics of District School Meal Programs as Reported by School Business Officials (N = 88)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food safety certification required by districts for FSD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>38</td>
<td>43.18</td>
</tr>
<tr>
<td>No</td>
<td>37</td>
<td>42.05</td>
</tr>
<tr>
<td>Don’t know</td>
<td>10</td>
<td>11.36</td>
</tr>
<tr>
<td>No response</td>
<td>3</td>
<td>3.41</td>
</tr>
<tr>
<td>Food safety certification for kitchen manager required by districts</td>
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<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51</td>
<td>57.95</td>
</tr>
<tr>
<td>No</td>
<td>23</td>
<td>26.14</td>
</tr>
<tr>
<td>Don’t know</td>
<td>8</td>
<td>9.09</td>
</tr>
<tr>
<td>No response</td>
<td>6</td>
<td>6.82</td>
</tr>
<tr>
<td>Management type</td>
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<tr>
<td>Self-operated</td>
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</tr>
<tr>
<td>Contract company</td>
<td>21</td>
<td>23.86</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>1.14</td>
</tr>
<tr>
<td>Funds from the general fund transferred to district foodservice program</td>
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</tr>
<tr>
<td>Yes</td>
<td>29</td>
<td>32.95</td>
</tr>
<tr>
<td>No</td>
<td>58</td>
<td>65.91</td>
</tr>
<tr>
<td>Don’t know</td>
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<td>0.00</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>1.14</td>
</tr>
<tr>
<td>District foodservice program financial operational effectiveness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Break-even</td>
<td>60</td>
<td>68.18</td>
</tr>
<tr>
<td>Generate profit</td>
<td>19</td>
<td>21.59</td>
</tr>
<tr>
<td>Minimize loss</td>
<td>8</td>
<td>9.09</td>
</tr>
<tr>
<td>Don’t know</td>
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<td>0.00</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>1.14</td>
</tr>
</tbody>
</table>

93.8%, respectively). Responses of the SBOs mirrored those of FSDs in this study who answered this question.

Financial

The range of expenditure budgets fell between $0.6 million and $7.8 million, with an average of $2.1 million, a budget figure just slightly higher than that reported by FSDs in this study. The respondents’ indication of financial position of the school foodservice program is noted in Table 6. Most respondents indicated the effectiveness of financial operations for the
meals program was “break-even” (68.2%), and close to two-thirds (65.9%) of the respondents reported the school foodservice programs did not receive money from the general fund. Thornton (2007) reported 35% of districts in her survey were financially stable with three months operating balance.

Certification for Food Safety

The SBO respondents reported their districts required food safety certification more frequently for kitchen managers than for FSDs (58.0% compared to 43.2%, respectively). This is still lower than the findings from the SNA 2005 Operations Report (SNA, 2005b) for kitchen managers at 64.9% and the SNA 2007 Operations Report (SNA, 2007) at 70.8%. Sneed, Oakley, and Ellis (2006) found few state agencies required food safety certification for employees, for kitchen managers (12.2%), or for directors (7.3%); requirements that do exist are based on the food code adopted by the jurisdiction. O’Toole et al. (2007), in a national study, found professional preparation for newly hired foodservice manager across the nation were required by 53.9% of districts to have food safety certifications. This may be due to perceptions that kitchen managers are more directly involved with food preparation than are FSDs or an assumption that directors with higher educational levels or professional certifications will have the proper background in all aspects of the position. Food safety certification requirements are described in Table 6.

Perceptions About Board-Level Policies

FSDs and SBOs were asked whether they thought district board-level polices supporting safe food practices could help reduce foodborne incidence. Of the 166 responding FSDs and 88 responding SBOs, the majority in each group (FSDs, \( n = 119 \); SBOs, \( n = 54 \)) thought district board-level polices supporting safe food practices could help
reduce foodborne illness. However, a small number of FSDs ($n = 16$) and SBOs ($n = 9$) indicated policies at this level would not help reduce foodborne illness. Some ambivalence was noted among 20 FSDs who indicated response options of “not sure” and “do not know” ($n = 17$ and $3$, respectively). A greater number of SBOs indicated uncertainty that board-level food safety policies could reduce foodborne illness by responding with a “not sure” and “do not know” ($n = 21$ and $2$, respectively).

**Existence of District Board-Level Food Safety-Related Policies**

Of the 124 FSDs who responded to a question asking about existence of district board-level food safety-related policies, 65 indicated these were present whereas 59 reported the policies were not present. Yet, the majority of all FSDs ($n = 96$) indicated that policies did exist in their districts for kitchen/facility use for purposes other operation of the child nutrition program. Similar findings were reported by the SBOs: 47 of the 91 (51.7%) indicated district board-level food safety-related policies were in existence, 36 (39.56%) reported the policies were not in place, and 8 did not respond. A larger percentage of SBOs than FSDs noted kitchen and facility use policies for purposes other than the child nutrition program were in place ($n = 58$, $n = 96$, respectively). Just over one fourth (27.1%, $n = 45$) of FSDs indicated policies were in place for food prepared at home and brought in for resale to broader groups (such as for bake/hoagie sales). A similar extent of awareness of the existence of policies related to food prepared at home for resale at school was found by SBOs (30.8%, $n = 28$). Just 10.0% ($n = 17$) of school FSDs indicated polices related to food prepared at home and brought in for a covered dish dinner (not for resale) were in place, and findings were similar for the responding SBOs ($n = 10$, 11.0%). District policies related to
food prepared at home and served for classroom policies were identified in place by 58 (34.9%) of the FSDs and 36 (39.6%) of SBOs. Details of the findings are shown in Table 7.

These findings suggest that both groups (FSDs and SBOs) in public school districts in all states of the Mid-Atlantic region were more concerned with food prepared at home and either sold to or served to students during class time for parties and celebrations than foods prepared at home and served to a group of district patrons in a non-school-sponsored setting. These differences may be explained by state regulations for foodservice establishments that do not permit certain foods to be prepared in non-licensed locations, such as homes, and sold to the public. The example given on the questionnaire was for a hoagie sandwich, a menu item that contains ingredients that must be temperature controlled for safety and, thus, presents a higher level of risk than does a bake sale item, such as a cookie. There were a few responses by FSDs ($n = 10$) and SBOs ($n = 6$) that indicated their districts did not permit any food prepared at home for resale. In addition, covered dish dinners also were identified by some as not allowed, thus policies addressing these topics were not necessary, which may have influenced responses. Given that children under the age of nine are considered at greater risk of contracting a foodborne illness than are healthy adults, and foods that are served during the school day could be considered the districts’ responsibility, thus increasing liability exposure, many districts have specified location and types of food allowed for classroom parties and other events outside of the school meal setting. Food prepared at home does pose a risk, given that viral foodborne pathogens such as hepatitis A and norovirus have been implicated in outbreaks of foods not typically thought of as potentially hazardous, such as fresh produce and baked goods (NRAEF, 2008)
Table 7

Foodservice Directors and School Business Officials Identification of Board-Level Policy Existence in Their Districts

<table>
<thead>
<tr>
<th>Board-level policy</th>
<th>School FSD responses (n = 166)</th>
<th>SBO responses (n = 91)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Food safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>65</td>
<td>39.16</td>
</tr>
<tr>
<td>No</td>
<td>59</td>
<td>35.54</td>
</tr>
<tr>
<td>No response</td>
<td>42</td>
<td>25.30</td>
</tr>
<tr>
<td>Kitchen use by outside groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>96</td>
<td>57.83</td>
</tr>
<tr>
<td>No</td>
<td>29</td>
<td>17.47</td>
</tr>
<tr>
<td>No response</td>
<td>41</td>
<td>24.70</td>
</tr>
<tr>
<td>Foods prepared at home for resale in school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>45</td>
<td>27.11</td>
</tr>
<tr>
<td>No</td>
<td>74</td>
<td>44.58</td>
</tr>
<tr>
<td>No response</td>
<td>47</td>
<td>28.31</td>
</tr>
<tr>
<td>Foods prepared at home for in-class parties/celebrations/treats</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>58</td>
<td>34.94</td>
</tr>
<tr>
<td>No</td>
<td>62</td>
<td>37.35</td>
</tr>
<tr>
<td>No response</td>
<td>46</td>
<td>27.71</td>
</tr>
<tr>
<td>Foods prepared at home for covered dish dinners</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>17</td>
<td>10.24</td>
</tr>
<tr>
<td>No</td>
<td>93</td>
<td>56.02</td>
</tr>
<tr>
<td>No response</td>
<td>56</td>
<td>33.73</td>
</tr>
<tr>
<td>Training of all district staff in food safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>2.41</td>
</tr>
<tr>
<td>No</td>
<td>113</td>
<td>68.07</td>
</tr>
<tr>
<td>No response</td>
<td>49</td>
<td>29.52</td>
</tr>
<tr>
<td>Training of all foodservice staff in food safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>51</td>
<td>30.72</td>
</tr>
<tr>
<td>No</td>
<td>69</td>
<td>41.57</td>
</tr>
<tr>
<td>No response</td>
<td>46</td>
<td>27.71</td>
</tr>
<tr>
<td>Training of volunteer staff in food safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>14</td>
<td>8.43</td>
</tr>
<tr>
<td>No</td>
<td>101</td>
<td>60.84</td>
</tr>
<tr>
<td>No response</td>
<td>51</td>
<td>30.72</td>
</tr>
</tbody>
</table>

Note. FSD = Foodservice Director, SBO = School Business Official.
Only 2.4% \((n = 4)\) of the FSDs indicated that a board-level policy was in effect that required food safety training of all district staff, whereas more SBOs \((n = 13, 14.3\%)\) noted the existence of such a policy in their districts. This finding suggests SBOs perceive training may exist. Less than half of both FSDs \((n = 51, 30.7\%)\) and SBOs \((n = 35, 38.5\%)\) indicated food safety training was required by the district for all foodservice staff. This finding varies with results reported by Youn and Sneed (2002), which indicated that 54% of districts’ managers/supervisors had received food safety training and certification yet only 14% of the districts indicated that more than 75% of foodservice staff had training and certification. In the current study, a lower proportion of FSDs \((8.4\%, n = 14)\) reported their districts required food safety training for volunteers than did SBOs \((14.3\%, n = 13)\). Various school district staff and volunteer parents may be involved in food preparations and/or service of foods throughout the school day, particularly as there is increased focus on nutrition education and school gardens and with increasing labor costs and budgets cut. In some districts, the school secretary works the serving area to reduce foodservices costs (E. Hanna, personal communication, July 1, 2009) and aftercare snacks may be distributed by a teacher’s aide. Facility or transportation staff may be assigned tasks of receiving or transporting foods between schools. Teachers frequently serve foods in the classroom as snacks to reinforce educational concepts with the use of colorful fruits and vegetables, and nurses teach children hand washing. The H1N1 flu virus threat resulted in many health organizations recommending vigilant hand washing to reduce the spread of infections. As caregivers, teachers, and staff become more involved in food handling; there is greater risk for children (Marx, 2008). Thus, district-wide, board-level policies ensure consistent actions among the
school district’s buildings and by school district workers and volunteers. Findings about existence of various policies are shown in Table 7.

**Importance of District Board-Level Food Safety-Related Policies**

Foodservice directors rated their perceptions of importance for food safety related policies using a five-point Likert-type scale ranging from 1 (*very unimportant*) to 5 (*very important*). Findings are shown in Table 8. FSDs (*n* = 166) indicated the presence of a board-level related policy about food safety was important with a mean rating of 4.37, whereas SBOs rated the importance of the existence of such a district policy with a mean rating of 4.17. The policy rated as most important by FSDs (*M* = 4.56) and second most important by SBOs (*M* = 4.20) was one regarding use of foodservice kitchens by those outside of the foodservice department. Findings also revealed FSDs rated policies about food brought from home for resale, use in the classroom, and events where food is not sold, such as covered dish dinners, as more important than did SBOs, with mean ratings of 4.25 compared to 3.75, 4.27 compared to 3.82, and 3.68 compared to 3.09, respectively.

The FSDs indicated that placed policies to address foods from home were more important than did SBOs, perhaps due to their greater awareness of how foods can become contaminated and recognition of the need to protect school children or members of the community from possible food related illnesses. FSDs and SBOs rated the importance of a district policy requiring food safety training for foodservice staff similarly as important to very important (*M* = 4.46 and *M* = 4.41, respectively), indicating there is recognition that staff with primary responsibilities in production and service of food should have the necessary training.
Table 8

Food Service Directors’ and School Business Officials’ Mean Ratings$^a$ and Standard Deviations of the Importance of Food Safety District Board-Level Policy Items

<table>
<thead>
<tr>
<th>Item</th>
<th>FSD responses (n = 166)</th>
<th>SBO responses (n = 91)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M</td>
</tr>
<tr>
<td>Importance of a district board-level policy about food safety</td>
<td>154</td>
<td>4.37</td>
</tr>
<tr>
<td>Importance of a district board-level policy for kitchen use</td>
<td>153</td>
<td>4.56</td>
</tr>
<tr>
<td>Importance of a district board-level policy for foods prepared at home for resale</td>
<td>153</td>
<td>4.25</td>
</tr>
<tr>
<td>Importance of a district board-level policy for foods prepared at home for in-class parties/celebrations/ treats</td>
<td>153</td>
<td>4.27</td>
</tr>
<tr>
<td>Importance of a district board-level policy for foods prepared at home for covered dish dinners</td>
<td>143</td>
<td>3.68</td>
</tr>
<tr>
<td>Importance of a district board-level policy on training of all district staff in food safety</td>
<td>153</td>
<td>2.70</td>
</tr>
<tr>
<td>Importance of a district board-level policy on training of all food service staff in food safety</td>
<td>156</td>
<td>4.46</td>
</tr>
<tr>
<td>Importance of a district board-level policy on training of volunteer staff in food safety</td>
<td>154</td>
<td>3.75</td>
</tr>
</tbody>
</table>

Note. FSD = Food Service Directors, SBO = School Business Officials.$^a$ Mean ratings scored on a scale where 5 = very important, 4 = somewhat important, 3 = neither important or unimportant, 2 = somewhat unimportant, 1 = very unimportant.

It is interesting to compare the perceived levels of importance of board-level policies related to food safety with the actual existence of such policies. For example, the existence of a policy requiring food safety training for foodservice staff was found in over one third of the FSDs’ (n = 51, 30.7%) and SBOs’ districts (n = 35, 38.5%). This suggests the perceived need for such policies has not been articulated or recognized by districts’ decision makers such as administrators and school board members. It is also interesting that the widespread need for food safety training for all staff was not identified. However, food safety training for all foodservice staff was the only statement with a significant difference in responses between the two groups ($p = .002$). As noted earlier, both the SNA 2007 Operations Report...
(SNA, 2007) and the SNA 2009 Operations Report (SNA, 2009) found 87% and 90.1%, respectively, of all foodservice staff received food safety training, which is a considerably higher percentage than findings in this study. The importance of a policy requirement was rated lowest, with mean ratings by FSDs of 2.70 and by SBOs of 2.76, yet the perceived importance for volunteers to receive food safety training was higher (FSDs, \( M = 3.75 \); SBOs, \( M = 3.46 \)). In many districts, volunteers hold food related fundraisers or operate concessions at sports, music, and other school events as a means to generate funds. Foods sold by these groups may be an important revenue source, but they may also sell potentially hazardous foods such as tacos, burgers, pizza, and hoagie sandwiches with fresh tomato slices. Risks of foodborne occurrences may increase when non foodservice, noncertified food handlers are unaware of safe practices during preparation, service, and storage. Given the increased emphasis on the school health environment, it would seem logical that food safety training would be made available to protect the children and public at school-related functions.

Responses from all FSDs and SBOs were compared using a t test on whether or not the policy existed (PE scale) and the importance of the foodservice policy (PI scale). Prior to completing the t test procedure, PI scale means were calculated for the t test comparison. Results of the t test for the PE scale indicated the data met the assumption of equal variances (Levene’s test, \( p = .494 \)) and there were no statistically significant differences, \( t (214) = -.521, p = .603 \), between all the FSDs’ (\( M = 2.67, SD = 2.03 \)) and all the SBOs’ (\( M = 2.82, SD = 2.17 \)) responses. Results for the t test for PI scale for all the respondents indicated the data met the assumption of equal variances (Levene’s test, \( p = .075 \)), and there were statistically significant differences, \( t (243) = 2.961, p = .003 \); findings indicated there were statistically significant differences in the perceived levels of importance for FSDs and SBOs.
and that FSDs had a significantly higher mean rating for all eight of the food safety items \( (M = 4.01, SD = 0.72) \) than did SBOs \( (M = 3.70, SD = 0.840) \). All FSDs perceived a higher level of importance for the policy than did the SBOs. Internal consistency and reliability were assessed for the “Importance” scale items and the “Existence of Policy” scale items. The Cronbach’s alpha coefficient for the Importance scale items was .844, and the calculated Cronbach’s alpha coefficient for The Food Safety Policy scale items was .787, indicating the two scales had a moderately high level of internal consistency and reliability (Slavin, 1992).

Pairs of responses from the FSD and SBO from the same school district were matched and compared using a \( t \) test. In asking whether or not the policy exists (PE scale items) responses shown in Table 7 were summed and totals were used to compare the FSD and SBO responses. The PI scale items had scaled responses, and the mean was calculated to use for the \( t \) test comparison. SBO responses indicated they thought that policy existed (PE scale) more on average than did FSDs, but the differences were not significant. Responses for the PI scale indicated equal variances could be assumed (Levene’s test, \( p = .138 \)), and there were statistically significant differences between the responses of the FSDs \( (M = 4.05, SD = 0.71) \) and SBOs \( (M = 3.73, SD = 0.81) \), \( t (177) = -2.829, p = .005 \). Responses of the FSDs indicated they thought the items on the PI scale were of more importance than did SBOs.

**Influencers of Administrative Support and Funding Provided for Food Safety Training**

The FSDs and SBOs identified whether they thought nine listed items would positively influence district administrative support and funding for food safety training. Findings are shown in Table 9. The item identified most frequently by both FSDs \( (n = 139, 83.7\%) \) and SBOs \( (n = 77, 84.6\%) \) was state or federal agency mandate for requirement of
such training. Stinson et al. (2011) asked FSDs what motivated their district to develop a HACCP-based food safety plan; close to 80% of the respondents indicated a state mandated requirement was the impetus and 56.1% responded that the reason was federal law. Stinson et al.’s findings suggest that, even after 5 years, some FSDs were unaware of the federal mandate. Food safety language was present in P.L. 108-265, the 2004 law requiring HACCP implementation by school year 2006; however, this policy mandate was unfunded at the district level for the development of and provision of staff training about the HACCP-based food safety plan. Some food safety training was provided by 35 states, as reported in one study assessing the period of 2003–2005 (Sneed et al., 2006). During this period, over 24,000 foodservice employees were trained in basic food safety and close to 10,000 received HACCP-related training provided by state agencies. The majority of training resources utilized by the state were from USDA-FNS and NSFMI (Sneed et al., 2005); however,

Table 9

*Food Service Directors’ and School Business Officials’ Identification of Items They Perceived Would Positively Influence District Funding for Food Safety Training*

<table>
<thead>
<tr>
<th>Items</th>
<th>FSD responses (n = 166)</th>
<th>SBO responses (n = 91)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n  %</td>
<td>n  %</td>
</tr>
<tr>
<td>Mandated by state/federal guidelines</td>
<td>139  83.73</td>
<td>77  84.62</td>
</tr>
<tr>
<td>CRE/SMI requirement</td>
<td>70  42.17</td>
<td>43  47.25</td>
</tr>
<tr>
<td>Corrective action during CRE/SMI review/audit</td>
<td>83  50.00</td>
<td>43  47.25</td>
</tr>
<tr>
<td>Knowledgeable director</td>
<td>59  35.55</td>
<td>36  39.56</td>
</tr>
<tr>
<td>District board policy</td>
<td>80  48.19</td>
<td>52  57.14</td>
</tr>
<tr>
<td>Foodborne illness outbreak in district</td>
<td>49  29.52</td>
<td>28  30.77</td>
</tr>
<tr>
<td>Attention from media or public relations</td>
<td>71  42.77</td>
<td>34  37.36</td>
</tr>
<tr>
<td>Parental demands</td>
<td>36  21.69</td>
<td>25  27.47</td>
</tr>
<tr>
<td>Food recall</td>
<td>29  17.49</td>
<td>15  16.48</td>
</tr>
</tbody>
</table>
Maryland developed a year-long training program for school foodservice staff, supervisors, and managers based on skills knowledge and best practices. Recent food code versions place responsibility on the person in charge to ensure safe food handling practices are followed in the foodservice. Achievement of good sanitary practice begins with training (Giampaoli, Sneed, et al., 2002; VanEgmond-Pannell, 1985) and training must be continual (Stinson et al., 2011).

The second most frequently identified item by the FSDs ($n = 83, 50.0\%$) that would influence administrative support of food safety was corrective action during a CRE/SMI audit. District board policy was the second most frequently identified influencer by the SBOs ($n = 52, 57.1\%$). Directors recognized the need to address deficiencies noted in external audits, particularly when failure to correct these could result in financial sanctions or loss of funding for the district’s child nutrition program. The third most likely influencer identified by the FSDs was district board-level policy ($n = 80, 48.2\%$), whereas SBOs indicated CRE requirements and corrective action during a CRE/SMI audit as the third most likely influencer ($n = 43, 47.3\%$). Also noted by both groups was attention from the media (FSD: $n = 71, 42.8\%$; SBO: $n = 34, 37.4\%$). SBOs also identified that a positive influence for funding of food safety training was knowledgeable FSDs ($n = 36, 39.5\%$). Thornton (2007) noted that schools meeting Healthier U.S. School Challenge standards most frequently had a person who had earned a 4-year college degree administering the child nutrition program. The importance of improving professional requirements for those administering child nutrition programs was included in the Child Nutrition Reauthorization Act of 2010, also known as the Healthy Hunger-Free Kids Act. With the increasing
complexity of child nutrition program administration, a director with the necessary educational background and experiences is needed to successfully manage these programs.

The items least frequently identified by FSDs and SBOs as those that would positively influence district administrative support and funding for food safety training were a foodborne outbreak in the district (FSD: $n = 49, 29.5\%$; SBO: $n = 28, 30.8\%$), parental demands (FSD: $n = 36, 21.7\%$; SBO: $n = 25, 27.5\%$), and a food recall (FSD: $n = 29, 17.5\%$; SBO: $n = 15, 16.5\%$). National Coalition for Food-Safe Schools (2004) indicated that administration sends a message that safety is important when training is supported and activities that prevent foodborne illness are valued. Belo, Giampaoli, and McProud (1996) identified training as a means to reduce the opportunity for foodborne illness to occur. Marx (2008) indicated ongoing training is necessary to achieve a safe school environment. Brenda Greene, Director of School Health Programs at the National School Boards Association noted in the publication, *Eating Safely at School*, that involvement of both district and school-level teams to create a systemic approach to protecting the health of the school community was needed (Marx, 2008). If there is a concern, the school board and administration could be held accountable. Creating a policy to prevent foodborne illness demonstrates board members’ commitment to promoting and safeguarding a healthy school environment. The direct and indirect costs incurred as a result of a foodborne illness outbreak in a school such as embarrassment, damaging reputation, reduction in impact participation rates of school meals, negative press, lawsuits, financial hardship, and possible fatalities could be prevented with provision of regular training (Lockner, Hildebrant, & Pacheco, 2003).
Findings from this study indicated funding is perceived by both FSDs and SBOs as a change agent. School FSDs (71.7%) and SBOs (54.5%) were positive when responding to whether district board-level policies would support safe food practices and help reduce foodborne incidences. However, Story (2008) found only 65.0% of FSDs reported confidence that additional food safety policies would result in fewer outbreaks, but these respondents also indicated appropriate food safety practices were currently followed in their districts.

Staff trained in safe food handling exhibit more favorable attitudes toward food safety practices and are more likely to practice appropriate food safety behaviors than those who are not trained (Henroid & Sneed, 2004; Hwang et al., 2001; Sneed, Strohbehn, & Gilmore, 2004; Youn & Sneed, 2002). Training is not only related to decreased turnover and increased job satisfaction, it may also lessen absenteeism (Conklin, 2008) and build loyalty to the child nutrition program (Oakley, 2008). Given the complexity of district administrators’ positions, the current budgetary issues facing schools, and perhaps their limited knowledge of specifics of child nutrition program administration, the finding that there is a perceived need for district board-level policies addressing food safety is not surprising. Sneed and Henroid (2003) found FSDs responded that an impetus for beginning food safety HACCP programs was to reduce school district liability, and that HACCP food safety plans could be viewed as an insurance policy and avoid negative press. Findings from this study also indicated the provision of food safety training for foodservice and other school staff is important; thus FSDs could work in concert with SBOs to ensure adequate funding is allocated for this to occur. Rushing, Nettles, and Johnson (2009) found FSDs identified themselves as representatives to the administration.
School Business Officials’ Knowledge of Food Safety Policy Mandates in Child Nutrition Programs

The Child Nutrition and WIC Reauthorization Act of 2004 (P.L. 108-265) section 111, required each food production and service site within a school district to implement a food safety plan based on HACCP principles. A document with information on planning and implementation of the food safety plan entitled, *USDA Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles* (USDA-FNS, 2005), was prepared. The USDA’s guidance document for implementation was mailed to the school food authority in each district participating in child nutrition programs (NSLP and/or SBP). This guidance document identified the minimum elements for inclusion in the district’s food safety plan based on HACCP principles.

In this study, SBOs responded to three questions about the section of the Child Nutrition and WIC Reauthorization Act of 2004 (P.L. 108-265) related to food safety plan implementation. SBOs rated their level of familiarity with the new law using a 5-point scale ranging from 1 (*no knowledge of the law*) to 5 (*very familiar*). SBOs also identified from a list of resources those that had been used to gain information about the new legislation and the elements they understood to be required in the district’s food safety plan. The majority of the 88 responding SBOs self-reported low familiarity with this mandate with a mean rating of 2.70 on the 5-point scale (5 = very familiar). Only 18 SBOs indicated they were either very familiar (*n* = 8, 9.1%) or familiar (*n* = 10, 11.4%), whereas 30 of the 88 (34.1%) reported they were unfamiliar (rating of 2 on the 5-point scale). Eleven SBOs (12.5%) reported they did not know about the mandated food safety legislation. This low level of reported
familiarity may be due to other requirements of the legislation. P.L. 108-265 also mandated the development of a board-level approved wellness policy in each school district.

Principals are members of the district administration and have been identified as key players in the implementation of a school wellness policy (Molaison & Carr, 2006). Brounstein’s (2003) study focused on school superintendents’ knowledge and familiarity of the National Association of School Boards’ publication about school based nutrition policies entitled *Fit, Healthy and Ready to Learn* (Bogden, 2000). Knowledge about this document was self-reported as very low by 23% of responding superintendents, with over 44% indicating they had never seen this publication. It is possible SBOs, who serve in an administrative role similar to principals and superintendents, were more involved with the wellness policy aspects of the 2004 Child Nutrition Reauthorization Act than with the food safety requirements, with delegation of HACCP planning to the FSDs (Story, 2008).

In a study assessing knowledge of school principals about the LWP, Molaison, Carr, and Hubbard (2007) noted 19% of responding principals were uninformed about school wellness policy implementation requirements; however, they were knowledgeable about specifics such as preventing the sale of carbonated beverages and inclusion of the physical education component in the curriculum. S. Roberts, Pobocik, Deck, Besgrove, and Prostine (2009) had findings similar to Molaison et al. (2007), who reported principals did not know the details of the new LWP for their districts. Molaison, Carr, and Federico (2008) further noted successful implementation of a developed LWP needed support of administration, teachers, and parents. In a follow-up study to Molaison et al.’s (2007) work, knowledge of the LWP by principals was significantly higher, as 92.9% of principals reported knowledge
about the LWP (Molaison et al., 2011). Furthermore, the later study showed a positive relationship between knowledge of the LWP requirements and implementation.

Close to half of the SBOs in the Mid-Atlantic region districts were unfamiliar (34.1%) or did not know (12.5%) about the food safety component of the Reauthorization Act of 2004 when polled in the fall of 2008 for this study. Based on this data, there appears to be a need to raise the awareness of SBOs and other administrators about these mandates, because additional resources from districts may be needed to comply with the regulations. This finding is a concern as implementation of a food safety plan in each district based on HACCP principles was required to begin with the start of the school year in 2006. School FSDs need the support of principals and other school administrators (Barratt, Cross, Mattfeldt-Beman, & Katz, 2004; Rainville, Choi, & Brown, 2003, 2005), as all play an important role in helping to create a healthy school environment (Molaison et al., 2007). The lack of awareness about district food safety plan implementation suggests little discourse between foodservice department personnel and other school administrators, even though Rushing et al. (2009) found FSDs agreed strongly they were representatives to the administration. Story (2008) noted that the perceptions of foodservice administrators of the inputs required to implement a food safety plan based on HACCP principles required both direct and indirect costs with financial inputs including dollars and time (labor).

**Requirements of Legislation**

SBOs identified sources of information about requirements of the new legislation from a given list. The majority of the SBO responses to these questions indicated learning of the requirements of the legislation through the school FSD (n = 55, 62.5%); the other frequently identified sources were state agency/agriculture departments (n = 19, 21.6%) or
regional or local SBO meetings \((n = 13, 14.8\%)\). The source of information identified least frequently was the district superintendent \((n = 2, 2.3\%)\). These findings suggest FSDs are considered the resource for a district’s central office about changes to school nutrition program legislation. In Molaison et al.’s (2007) national study of school administrators, it was found that principals learned of child nutrition program legislative changes through principal meetings, district meetings, FSDs, superintendents, the department of education and conferences. Results from this study were similar, with findings about sources of information shown in Table 10. However, the USDA guidance document (USDA-FNS, 2005a), which was sent to the school food authority in every district in the country, did not appear to have been reviewed by SBOs. It could be that SBOs were not the designated school food authority for their districts or that personalized sources of information were preferred over written guidance.

Table 10

School Business Official-Identified Sources of Information About P.L. 108-265 \((N = 88)\)

<table>
<thead>
<tr>
<th>Sources of information(^a)</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>School foodservice director</td>
<td>55</td>
<td>33</td>
</tr>
<tr>
<td>State agency and/or Department of Agriculture</td>
<td>19</td>
<td>69</td>
</tr>
<tr>
<td>Local and/or regional SBO meeting</td>
<td>13</td>
<td>75</td>
</tr>
<tr>
<td>USDA guidance document</td>
<td>7</td>
<td>81</td>
</tr>
<tr>
<td>National SBO meeting</td>
<td>3</td>
<td>85</td>
</tr>
<tr>
<td>Other sources</td>
<td>4</td>
<td>84</td>
</tr>
<tr>
<td>Superintendent</td>
<td>2</td>
<td>86</td>
</tr>
<tr>
<td>TOTAL</td>
<td>103</td>
<td>513</td>
</tr>
</tbody>
</table>

\(^a\)Multiple responses possible.
Essential Elements in the Development of a Food Safety Plan as Identified by School Business Officials

An effective food safety plan ensures children are served safe food in school meal programs by controlling hazards that may occur between purchasing of the food until service to the children. Essential elements in the development of a food safety plan were described in the USDA guidance document (USDA-FNS, 2005a). SBOs identified whether listed elements were required of a food safety plan. No responses were interpreted as elements not required. Overall, SBOs appeared knowledgeable about what elements were essential in a food safety plan, with correct identification ranging from 22.7% to 69.3%. The majority of SBOs ($n = 61, 69.3\%$) correctly indicated SOPs were an essential component of a school food safety plan. SOPs are useful in providing written procedures that address sanitation and controls to avoid time and temperature abuse of foods. Two other elements recognized by over 60% of respondents as important components of a food safety plan were recordkeeping and training (64.8% and 63.6%, respectively). The high recognition by SBOs of the need for training is not surprising given its basis as an administrative function. Monitoring and corrective actions were identified by more than 50% of the SBOs (54.6% and 52.3%, respectively). Written records are essential for documentation, verification, and proof of safety processes and are indeed a key component of a HACCP-based food safety plan.

Monitoring is a process that involves observations and measurements, such as checking endpoint cooking temperatures. Corrective actions are the steps taken when the monitoring process identifies established standards are not being met, such as continued cooking of a product that has not reached required temperature or reporting an out-of-range cooler temperature.
Other elements correctly identified by SBOs as necessary for a food safety plan were procurement practices (42.1%), an overview of the district and types of meals served (37.5% each), menu (34.1%), and description of each facility (34.1%). Purchasing of safe food products from approved suppliers is one of the first steps in ensuring safe food for students. Suppliers must be reputable, adhere to safe food practices, and be inspected by regulatory agencies. The menu drives the cold and hot food production and handling procedures as well as holding of foods until, and during, service. Although it is logical that specific steps in the flow of food might not be recognized by SBOs, it is surprising that only about one third grasped the fundamental role the menu plays by identifying it as an essential part of a food safety plan.

Similarly, assignment of all food menu items into one of three process categories established by the USDA guidance document (USDA-FNS, 2005a) was identified as an essential element of a school food safety plan by less than one third (31.8%, $n = 28$) of the SBOs. The concept of categorizing each food item into one of the three USDA-identified process categories is based on when and how the food is prepared: uncooked or ready-to-eat food; cooked and served the same day; or cooked, cooled, and served on a future day. It may be that identification of menu item categorization as an essential element of a food safety plan was due to lack of understanding by SBOs of the complexity of quantity meal production and service or due to lack of understanding process categories. The use of the process category approach to HACCP development allows for streamlining of SOPs, critical limits and standards, monitoring, and corrective action steps into three categories rather than one for each food item.
Table 11

<table>
<thead>
<tr>
<th>Essential elements</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOPs</td>
<td>61</td>
<td>69.32</td>
<td>27</td>
<td>30.68</td>
</tr>
<tr>
<td>Recordkeeping</td>
<td>57</td>
<td>64.78</td>
<td>31</td>
<td>35.23</td>
</tr>
<tr>
<td>Training</td>
<td>56</td>
<td>63.64</td>
<td>32</td>
<td>36.36</td>
</tr>
<tr>
<td>Monitoring responsibly</td>
<td>48</td>
<td>54.55</td>
<td>40</td>
<td>45.46</td>
</tr>
<tr>
<td>Corrective actions</td>
<td>46</td>
<td>52.27</td>
<td>42</td>
<td>47.73</td>
</tr>
<tr>
<td>Procurement processes</td>
<td>37</td>
<td>42.05</td>
<td>51</td>
<td>57.95</td>
</tr>
<tr>
<td>Overview of the district</td>
<td>33</td>
<td>37.50</td>
<td>55</td>
<td>62.50</td>
</tr>
<tr>
<td>Type of meals served in school</td>
<td>33</td>
<td>37.50</td>
<td>55</td>
<td>62.50</td>
</tr>
<tr>
<td>Menu</td>
<td>30</td>
<td>34.09</td>
<td>58</td>
<td>65.90</td>
</tr>
<tr>
<td>Description of each facility/school</td>
<td>30</td>
<td>34.09</td>
<td>58</td>
<td>65.90</td>
</tr>
<tr>
<td>Food items identified by category</td>
<td>28</td>
<td>31.82</td>
<td>60</td>
<td>68.18</td>
</tr>
<tr>
<td>Kitchen equipment and layout</td>
<td>26</td>
<td>29.55</td>
<td>62</td>
<td>70.45</td>
</tr>
<tr>
<td>Organizational chart–school foodservice department</td>
<td>21</td>
<td>23.86</td>
<td>67</td>
<td>76.14</td>
</tr>
<tr>
<td>Meal times</td>
<td>20</td>
<td>22.73</td>
<td>68</td>
<td>77.27</td>
</tr>
</tbody>
</table>

Elements identified by fewer than 30% of the SBOs as essential in the development of a school food safety plan were kitchen equipment and layout, an organizational chart of the department, and meal times (29.6%, 23.9%, and 22.7%, respectively). Findings for this section of the survey are shown in Table 11.

**District-Wide Staffing Information**

School business officials were asked to respond to 18 questions about annual hours provided through in-service, on-site, and external training to all staff in the district (non-certified, professional, and administrative) and to noncertified and certified school foodservice staff. In addition, SBOs were asked to indicate total number and full-time
equivalents of staff by these categories, funding sources used for training, topics addressed in training, and attendance at trainings for the 2007–2008 school year. SBOs used district and budgetary data to complete the questions. Of the 91 surveys returned, only 88 SBOs completed this section at least partially. The SBOs response rate for questions in this section of the survey ranged between 25 and 87 questions. Questions pertaining to total hours of training by classified groups comprised those with the fewest responses whereas questions pertaining to funding for foodservice training, participation in district in-service, and training topics had a response rate of 85.7%.

Training and Professional Development Support

The professional staff category (i.e., teachers) reportedly received the most training with a mean of 862.3 hours per district and a range between 0 and 7,000 hours. In four districts from one state, hours of training were noted at 1,000, 2,500, 3,000 and 7,000, respectively. Four districts in one state indicated hours of training for the administrative staff category of 200, 250, 500, and 2,000 hours, respectively. SBOs were asked to identify minimum training hours for foodservice staff; close to one third of the SBOs indicted zero minimum training hours for all foodservice training. This may be due to their lack of knowledge about training provided to foodservice personnel or that the directors really do not provide any training opportunities for staff, including those on the topic of food safety. The fewest reported training hours among all staff groups were for the categories of noncertified school food foodservice staff (i.e., hourly workers) and the certified school foodservice staff (i.e., managers and supervisors) with means of 30.27 and 22.06 hours, respectively. The range of training hours reported by district SBOs for noncertified school foodservice staff was zero (in two districts) to 300 hours (in one district). In one state, three districts indicated
training hours of 90, 150 and 300 hours, respectively, for noncertified staff, whereas training hours for certified school foodservice staff ranged from zero (in two districts) to 90 hours (in one district). Three districts responded training hours were not applicable based on contracts.

SBOs were asked about district support provided for the FSD’s professional development. Two-thirds of the responding SBOs \((n = 60)\) indicated professional development day(s) for school FSDs varied based on elements of an agreement or contract, with the annual number of development days specified ranging from zero days \((n = 22)\) to 20 days \((n = 2)\). However, three districts responded on the survey that the actual number of professional development days was unlimited; perhaps these districts do not restrict professional development days in or away from the district. The mean number of professional development days specified in agreements or contracts reported by 60 SBOs was 2.99. Close to one third of SBOs noted zero days were provided or as identified by agreement/contract. SBOs also indicated their perceptions of the number of professional development days used by school FSDs. A mean number of 4.24 days was reported by less than half of the SBOs \((n = 42)\) with again a range of zero \((n = 5)\) to 18 \((n = 1)\). SBOs reported similar funding sources for FSD training as for foodservice staff, with both general fund \((n = 69)\) and school foodservice funds \((n = 66)\) used for directors’ professional development.

The variability of these findings illustrates the difficulty in quantifying hours of training for staff in different categories of employment in schools. Nonetheless, results do provide some data about relative training inputs provided by districts, as reported by SBOs, for school foodservice personnel. As noted, SBOs may not be aware of all training opportunities received by staff. Findings are reported in Table 12.
Table 12

Ranges and Mean Total Hours Reported by SBOs for District Staff Training in School Year 2007–2008 by Category of Employees (N = 88)

<table>
<thead>
<tr>
<th>Staff categories</th>
<th>Responses</th>
<th>Hours</th>
<th>Most frequent response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>Non-certified staff</td>
<td>25</td>
<td>0</td>
<td>1,000</td>
</tr>
<tr>
<td>Professional staff</td>
<td>44</td>
<td>0</td>
<td>7,000</td>
</tr>
<tr>
<td>Administrative staff</td>
<td>26</td>
<td>0</td>
<td>2,000</td>
</tr>
<tr>
<td>Noncertified school foodservice staff</td>
<td>37</td>
<td>0</td>
<td>300</td>
</tr>
<tr>
<td>Certified foodservice staff</td>
<td>35</td>
<td>0</td>
<td>90</td>
</tr>
<tr>
<td>Do not know</td>
<td>38</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

District Requirements for Training by Staff Categories

Less than half of the 88 SBOs who responded to the question about district requirements for training of noncertified staff in their districts indicated training was required \((n = 36, 40.9\%)\); another 19.4% \((n = 17)\) did not know if there was a requirement. In asking SBOs about training topics, only foodservice topics were specified on the survey.

As might be expected, the professional staff category (i.e., teachers) received the most training with SBOs reporting a minimum number of 16.33 hours of paid training each year per staff member. Administrators received the next highest amount of training with a minimum number of 10.12 hours of paid training each year per staff member reported by SBOs. Of the 40 districts responding to the minimum number of training hours for all staff categories, close to 50% reported zero hours. Based on information provided by approximately half of the responding SBOs \((n = 46)\), each certified school foodservice staff received a mean of 4.99 hours of required training per academic year, whereas 41 SBOs reported noncertified school foodservice staff each received 3.1 hours and about half of
respondents reported zero minimum hours were provided. Responses for zero reported hours were coded differently from nonresponses. Findings from this survey provide evidence professional staff in child nutrition programs, classified as certified staff, receive much less training from their districts than do teachers. Although there may be regulations that dictate district funding for teacher professional development, the same opportunities clearly are not available for those administering child nutrition programs.

As reported earlier, SNA (2009) found over 51% of all foodservice staff received 8 or fewer hours of training annually. This is more than twice the amount of hours identified in this current study. The current West Virginia state policy 4321.1 series 86 sets training hours for school foodservice staff at 15 hours annually (Standards for School Nutrition, 2008), the prior policy, 4320 series 85, set training at 18 hours of job-related staff development annually. In their study, O’Toole et al. (2007) reported two-thirds of managers received professional development on food safety, food preparation, use of HACCP principles, and dietary guidelines. Story (2008) noted 81% of child nutrition program directors in her national study reported food safety training for staff about HACCP implementation was higher in 2006–2007 than in years prior.

**Funding Sources for School Foodservice Training**

Of responding SBOs to this section of the survey \((n = 88)\), only 13 (14.8%) reported use of the district general fund for school foodservice staff in-service training, whereas 77 (91.8%) indicated that primarily the foodservice fund was used. Five (5.7%) of the district SBOs indicated use of other funding sources, such as those from contracted management companies, were used for training of child nutrition staff.
Child nutrition programs funds are to be used only for specified purposes; training is an allowable expense. Implementation of HACCP-based food safety plans requires training for school foodservice management and hourly staff. However, these findings suggest the cost of that training was borne by school nutrition funds rather than other sources. O’Toole et al. (2007) reported over 96% of districts provided funding for staff development or offered staff development for school foodservice staff on at least one topic and more than three-quarters of districts provided funding for staff development or offered staff development for school foodservice staff on food safety, healthy food preparation, menu planning, and HACCP principles. O’Toole et al. did not identify the funding source for the staff development. The states of Pennsylvania, West Virginia, and New Jersey noted the funding for training was either from the general fund or a blend of the general fund and the foodservice fund. Sneed et al. (2006) reported 35 state agencies offered basic food safety training from 2003–2005, training over 24,000 foodservice staff. It may be that SBOs responding to the survey were unaware of school nutrition staff training about HACCP provided by state agencies or local health departments. Story (2008) noted these two organizations (state education and health departments) were identified by 40% and 41%, respectively, of child nutrition program administrators as providers of training about HACCP. Over three-fourths (n = 67, 76.1%) of the SBOs reported school foodservice staff were paid to attend training as part of district in-service training days. Generally, foodservice staff was paid from the foodservice fund. High attendance by school foodservice staff at paid in-service trainings was reported with 65.9% of SBOs indicating participation and about 13% not knowing whether or not foodservice staff attended.
Training Topics for School Foodservice Staff During District In-Service

SBOs identified training topics presented at district in-services that required foodservice staff attendance and counted as a staff day of work. District-wide topics outside the daily work scope of most staff, yet determined to be of sufficient importance or required by local, state or federal law to require foodservice staff to attend with pay are noted in Table 13. Topics at district in-services that more typically would be considered germane to a school foodservice worker’s job are identified in Table 14. Allergy awareness is noted in both tables. Common topics identified by about one third of SBOs at district-wide in-services that required foodservice staff attendance included allergy awareness, bloodborne pathogens, sexual harassment, school safety and security, diversity training, and bullying. It is interesting to note that not all responding SBOs indicated attendance was required or training was supported, as most organizations that receive federal funds are mandated to offer training on topics such as sexual harassment to all employees.

Table 13

*General Topics Identified by School Business Officials as Part of District In-Service Paid Training Required for School Foodservice Staff (N= 88)*

<table>
<thead>
<tr>
<th>Topics</th>
<th>Yes</th>
<th>No</th>
<th>No responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Allergy awareness</td>
<td>33</td>
<td>37.50</td>
<td>53</td>
</tr>
<tr>
<td>Bloodborne pathogens</td>
<td>32</td>
<td>36.36</td>
<td>54</td>
</tr>
<tr>
<td>Sexual harassment</td>
<td>27</td>
<td>30.68</td>
<td>59</td>
</tr>
<tr>
<td>School safety and security</td>
<td>16</td>
<td>18.18</td>
<td>70</td>
</tr>
<tr>
<td>Diversity</td>
<td>12</td>
<td>13.63</td>
<td>74</td>
</tr>
<tr>
<td>Bullying</td>
<td>10</td>
<td>11.36</td>
<td>76</td>
</tr>
</tbody>
</table>
Table 14

Food-Related Topics Identified by School Business Officials as Part of District In-Service Paid Training Required for School Foodservice Staff (N = 88)

<table>
<thead>
<tr>
<th>Topics</th>
<th>Yes</th>
<th>%</th>
<th>No</th>
<th>%</th>
<th>No responses</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food safety</td>
<td>49</td>
<td>55.68</td>
<td>37</td>
<td>42.04</td>
<td>2</td>
<td>2.28</td>
</tr>
<tr>
<td>Kitchen safety</td>
<td>41</td>
<td>46.59</td>
<td>45</td>
<td>51.13</td>
<td>2</td>
<td>2.28</td>
</tr>
<tr>
<td>Nutrition education</td>
<td>40</td>
<td>45.45</td>
<td>46</td>
<td>52.27</td>
<td>2</td>
<td>2.28</td>
</tr>
<tr>
<td>Material safety data sheets (MSDS)</td>
<td>36</td>
<td>40.90</td>
<td>50</td>
<td>56.82</td>
<td>2</td>
<td>2.28</td>
</tr>
<tr>
<td>Allergy awareness</td>
<td>33</td>
<td>37.50</td>
<td>53</td>
<td>60.22</td>
<td>2</td>
<td>2.28</td>
</tr>
<tr>
<td>Wellness and healthy behaviors</td>
<td>11</td>
<td>12.50</td>
<td>75</td>
<td>85.22</td>
<td>2</td>
<td>2.28</td>
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<tr>
<td>Healthy school environment</td>
<td>22</td>
<td>25.00</td>
<td>64</td>
<td>72.72</td>
<td>2</td>
<td>2.30</td>
</tr>
<tr>
<td>First aid</td>
<td>15</td>
<td>17.05</td>
<td>71</td>
<td>80.68</td>
<td>2</td>
<td>2.30</td>
</tr>
<tr>
<td>Fire safety</td>
<td>15</td>
<td>17.05</td>
<td>71</td>
<td>80.68</td>
<td>2</td>
<td>2.30</td>
</tr>
<tr>
<td>Heimlich maneuver</td>
<td>10</td>
<td>11.36</td>
<td>76</td>
<td>86.36</td>
<td>2</td>
<td>2.30</td>
</tr>
<tr>
<td>Cardiopulmonary resuscitation (CPR)</td>
<td>7</td>
<td>7.95</td>
<td>79</td>
<td>89.78</td>
<td>2</td>
<td>2.30</td>
</tr>
<tr>
<td>Automated external defibrillator (AED)</td>
<td>3</td>
<td>3.41</td>
<td>83</td>
<td>94.18</td>
<td>2</td>
<td>2.30</td>
</tr>
</tbody>
</table>

Topics related more closely to the work of school foodservice personnel, such as food safety, kitchen safety, nutrition education, material safety data sheets, and allergy awareness, were identified frequently by SBOs as subjects at district in-services that required and supported foodservice staff attendance. These topics were identified more frequently than were general subject matter topics, perhaps because it was assumed school foodservice staff would have greater interest and district support, and having attendance as a work day was considered more appropriate, for these work-related subjects.

Completeness of District’s Food Safety Plan

School FSDs (n = 166) rated their perceptions of the level of completeness in development and implementation of the written instructions or SOPs for their district’s food safety plan, as outlined in the USDA Guidance for School Food Authorities: (USDA-FNS,
FSDs used a 5-point rating scale ranging from 1 (nothing in writing or not started) to 5 (complete) in assessing levels of completion for 11 listed SOPs. The majority of the FSDs ($n = 156, 93.9\%$) indicated that completion and implementation of the identified SOPs in their districts were fairly complete ($M = 4.67$). The top three SOPs identified with greatest levels of completeness and implementation reported were: washing hands ($n = 135, 81.3\%$); cooking potentially hazardous foods ($n = 127, 76.5\%$); and holding of hot and cold potentially hazardous foods ($n = 127, 76.5\%$). The SOPs identified with the lowest completeness and implementation levels were: date marking of ready-to-eat potentially hazardous foods ($n = 110, 66.3\%$); receiving of deliveries ($n = 114, 68.7\%$); and storing and/or using poisonous or toxic chemicals ($n = 118, 71.1\%$). Other SOPs identified by the school FSDs noted as complete or fairly complete were availability of material safety data sheets, calibration of thermometers, and an employee health policy. Findings are shown in Table 15.

Close to 30\% of the school districts reported a lack of completeness with SOPs related to date marking of ready-to-eat potentially hazardous foods and receiving of deliveries. Dating of supplies and food products during receiving, storage, food preparation, and service assists staff in using oldest product first and knowing when to discard old products or following “first in–first out” best practice. Approved suppliers must be used by all retail foodservices (NRAEF, 2008). Generally, this means suppliers have the necessary licenses and have met standards of required inspections. In addition, as found in Serving It Safe (NSFMI, 2009), directors or assigned staff should observe cleanliness of delivery trucks, review these vendor health inspection reports or keep letters of assurance from vendors on file, coordinate delivery schedules with school times to ensure staff is available to receive
product properly by checking products’ delivery temperatures, and affirm there are no signs of damage or thawing of frozen products. SOPs define the process of acceptable receiving practices including temperature requirements and inspection of products. Any products not meeting established criteria (as noted on the written product specification or purchase order) should be refused. Once received and checked, all supplies and foods must be properly stored as per the written SOP to reduce risks of decreased quality or food spoilage. Findings from this survey also indicated lack of SOP development or implementation for storage and

Table 15

Food Service Directors’ Assessed Level of Completeness\(^a\) of Standard Operating Procedures for the District’s Food Safety Plan (\(N = 166\))

<table>
<thead>
<tr>
<th>Standard operating procedures(^b)</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>N/A</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Washing hands</td>
<td>135</td>
<td>81.33</td>
<td>16</td>
<td>9.64</td>
<td>3</td>
<td>1.81</td>
<td>2</td>
</tr>
<tr>
<td>Cooking PHF</td>
<td>127</td>
<td>76.51</td>
<td>24</td>
<td>14.46</td>
<td>3</td>
<td>1.81</td>
<td>1</td>
</tr>
<tr>
<td>Holding hot/cold PHF</td>
<td>127</td>
<td>76.51</td>
<td>23</td>
<td>13.86</td>
<td>5</td>
<td>3.01</td>
<td>1</td>
</tr>
<tr>
<td>Reheating PHF</td>
<td>125</td>
<td>75.30</td>
<td>16</td>
<td>9.64</td>
<td>1</td>
<td>0.06</td>
<td>1</td>
</tr>
<tr>
<td>Cooling PHF</td>
<td>121</td>
<td>72.89</td>
<td>28</td>
<td>16.87</td>
<td>5</td>
<td>3.01</td>
<td>1</td>
</tr>
<tr>
<td>Washing fruits and vegetables</td>
<td>126</td>
<td>75.90</td>
<td>21</td>
<td>12.56</td>
<td>5</td>
<td>3.01</td>
<td>2</td>
</tr>
<tr>
<td>Personal hygiene</td>
<td>123</td>
<td>74.10</td>
<td>25</td>
<td>15.06</td>
<td>6</td>
<td>3.61</td>
<td>1</td>
</tr>
<tr>
<td>Use of suitable utensils for RTE foods</td>
<td>120</td>
<td>72.29</td>
<td>23</td>
<td>13.85</td>
<td>6</td>
<td>3.61</td>
<td>2</td>
</tr>
<tr>
<td>Receiving deliveries</td>
<td>114</td>
<td>68.67</td>
<td>28</td>
<td>16.87</td>
<td>10</td>
<td>6.02</td>
<td>4</td>
</tr>
<tr>
<td>Storing and using poisonous or toxic chemicals</td>
<td>118</td>
<td>71.08</td>
<td>27</td>
<td>16.27</td>
<td>6</td>
<td>3.61</td>
<td>1</td>
</tr>
<tr>
<td>Date marking ready-to-eat PHF</td>
<td>110</td>
<td>66.27</td>
<td>27</td>
<td>16.27</td>
<td>13</td>
<td>7.80</td>
<td>4</td>
</tr>
<tr>
<td>Other ((n = 8))</td>
<td>6</td>
<td>3.61</td>
<td>2</td>
<td>1.20</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
</tr>
</tbody>
</table>

\(^{a}\)Rating scale: 5 = complete, 4 = fairly complete, 3 = somewhat complete, 2 = fairly incomplete, 1 = not started.

\(^{b}\)PHF = Potentially hazardous foods.
use of poisonous or toxic chemicals (71.1%). This is a concern, as chemicals frequently used for cleaning purposes can inadvertently or intentionally contaminate food and supplies if not stored or used properly. It is recommended cleaning and sanitizing agents be kept in an original container, away from all food and other supplies, in a locked storage area (NSFMI, 2009). If transferred to another container, it is recommended the new container be labeled with the name of the product.

In the NSFMI survey conducted in 2009, findings showed a vast majority of school nutrition directors and managers reported that their districts and schools, respectively, had implemented food safety programs based on HACCP principles (Molaison et al., 2011). However, additional assessments concluded that the implementation process often was not complete. The NSFMI study also found that the school food safety programs did not include all the components required for a program based on HACCP principles as outlined in the USDA guidance document (USDA-FNS, 2005a). Thornton (2007) found only 2.3% of schools in her national sample reported no implemented food safety plan. Past research of FSDs’ perceptions regarding food safety plan development indicated plans are in place (SNA, 2007). The SNA 2007 Operational Report (SNA, 2007) found that 90.3% of schools reported a formal food safety policy was in place. However, research such as this project and the NSFMI study, which assessed additional levels of implementation such as documentation and recordkeeping, suggested HACCP-based food safety plans are not completely integrated into child nutrition programs. It should be noted that both reports from SNA were from national samples, whereas the present study focused on the Mid-Atlantic region and asked about specific SOP implementation. The timing of data collection for all the studies also should be noted. This study’s survey data were gathered in 2008, 2 years after the required
July 2006 implementation date of the HACCP-based food safety plan. Information about readily available customized SOP templates from ISU Extension (2007, 2008), NSFMI, and other resources have been promoted to FSDs.

**Recordkeeping**

In this study, FSDs responded to questions about recordkeeping and documentation of the food safety plans in their programs. Documentation of specified tasks can prove care was exercised in a school operation. FNS (2005a) suggested seven steps in developing a school food safety plan; step six is recordkeeping. Records suggested by FNS entail aspects of the food safety plan related to monitoring and corrective action. Recordkeeping provides a basis for periodic review of the overall food safety program, and certain written records or documentation are needed to verify that the program is working. Respondents indicated if written records of the district’s food safety plans were kept by each school building with a “yes” or “no” response. Of the 155 FSDs responding to this question, the majority (94.2%, n = 146) indicated they kept written records of the district’s food safety plans by each school building. This is the correct method of recordkeeping as outlined in the USDA school HACCP guidance document (USDA-FNS-2005a). Two FSDs noted records were kept in the district office only. In these cases, it is possible the school office and the district office are the same. The remaining FSDs (3.2%) indicated written records were not kept. Detailed and proper records serve as support in demonstrating that food was prepared and served in a safe and sanitary manner and that established standards related to cleaning and sanitizing were met. This is a critical principle in the HACCP-based school food safety plan and, as noted, a fundamental requirement.
Record Retention

The FSDs identified the length of time that school food safety records were retained (Table 16). A total of 149 FSDs responded to this question. The most frequent responses were: 3 years \((n = 61, 40.9\% \text{ of all respondents})\); 3 plus the current year \((n = 27, 18.\% \text{)}\); and 2 years \((n = 24, 16.\% \text{)}\). Over 23\% of respondents indicated a time frame for recordkeeping of 5 to 7 years or more, with one district reporting records were kept for 10 years; the average number of years in this study was 3.6. The *USDA Guidance for School Food Authorities* (USDA-FNS, 2005a) and NSFMI (2009) recommended written logs be maintained a minimum of one year, yet no maximum time period was specified. Further clarification was requested from NSFMI in a personal communication (E. Howell, October 12, 2009). This contact indicated each state agency establishes the policy for length of time for recordkeeping, as time frames may be based on general liability requirements of each

<table>
<thead>
<tr>
<th>Number of years retained</th>
<th>Responses</th>
<th>(n)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>24</td>
<td>16.11</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>1</td>
<td>0.67</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>61</td>
<td>40.94</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>27</td>
<td>18.12</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>13</td>
<td>8.72</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>3</td>
<td>2.01</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>19</td>
<td>12.75</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>1</td>
<td>0.67</td>
</tr>
</tbody>
</table>
state. This clarification may explain why the responses were greater than recommended length of 1 year.

**Recordkeeping Log Documentation**

Responses to questions about use of specific recordkeeping logs identified in the HACCP guidance document (USDA-FNS, 2005a) ranged from 63.3% to 92.8% compliance (Table 17). FSDs responded if recordkeeping documents were present with a “yes,” “no,” or “do not know.” Refrigeration logs were rated as present in most of the districts (92.8%, \( n = 154 \)), whereas records for damaged or discarded products were identified as present in fewer districts (63.3%, \( n = 105 \)). Although logs may be in place, Henroid and Sneed (2004) found areas of improvement where training and education about food safety practices and increased documentation of practices for end-point cooking temperatures, refrigerator and freezer storage, and dish machine effectiveness were needed. The FNS suggested a food safety program review checklist to be used to document review of the school food safety program annually (USDA-FNS, 2005a). In this current study, no FSDs identified creating this log, thus it is suspected that school food safety program plans may not be reviewed with staff and updated annually. In training by Gilbert (2010), food safety plans must be signed off and posted in each food safety manual annually. The FNS further identified the four areas to be documented weekly as reviewed in the food safety program review check list: SOPs, food preparation processes, control measures, and corrective actions (USDA-FNS, 2005a). Only one FSD listed a corrective action log, which is a component of the food safety program review check list. Other recordkeeping logs identified by many of the FSDs were dishwasher sanitizing temperatures \( (n = 8) \), transport/satellite times and temperatures \( (n = 3) \), sanitizer solution concentrations \( (n = 5) \), freezer storage temperatures \( (n = 3) \), thermometer calibration
(n = 3), storage room temperatures (n = 3), ice machine (n = 2), and production reports (n = 2). The listing of logs was adopted from the FNS guide; however more logs are readily available from ISU Extension. Other logs not identified by FSD but available from ISU Extension in cooperation with the state agency are: annual calendar for training, hot holding log, menu planning worksheet, and menu production planning.

Table 17
School Foodservice Directors’ Responses to Types of Food Safety Records Retained (N = 166)

<table>
<thead>
<tr>
<th>Recordkeeping documents</th>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Refrigeration log</td>
<td>154</td>
<td>92.77</td>
<td>2</td>
<td>1.20</td>
</tr>
<tr>
<td>Cooking and reheating temperature log</td>
<td>149</td>
<td>89.76</td>
<td>8</td>
<td>4.82</td>
</tr>
<tr>
<td>Receiving log</td>
<td>121</td>
<td>72.89</td>
<td>27</td>
<td>16.27</td>
</tr>
<tr>
<td>Cooling temperature log</td>
<td>118</td>
<td>71.08</td>
<td>32</td>
<td>19.28</td>
</tr>
<tr>
<td>Damaged or discarded product log</td>
<td>105</td>
<td>63.25</td>
<td>42</td>
<td>25.31</td>
</tr>
</tbody>
</table>

HACCP-Based Food Safety Plan Documentation

The FSDs also identified whether documentation was in place for components of a HACCP-based food safety plan: prerequisite programs, hazard analysis, menu item identification in process category, critical control points, corrective actions, monitoring activities, and verification. Respondents indicated presence of these components with a “yes,” “no,” or “don’t know.” The most frequently reported documents present were for components of critical control points (n = 134, 80.7%); corrective actions (n = 133, 80.1%); and hazard analysis (n = 126, 75.9%). The documented use of prerequisite programs was least utilized as reported by these FSDs. Close to one third (28.9%, n = 48) of the
respondents identified that documentation of prerequisite programs, such as SOPs, were in place, whereas slightly less (26.5%, \(n = 44\)) stated they did not know whether this type of record was present. A summary record documenting prerequisite programs may be seen as duplicative, and it should be noted, given the high number and percentage of respondents who indicated the presence of SOPs and other documentation, that a conclusion that prerequisite programs were not in place could be in error. The benefits of prerequisite programs were noted in the HACCP implementation in K-12 schools guidance document (USDA-FNS, 2005a). The HACCP guidance document (USDA-FNS, 2005a) recommends a standardized checklist documenting the presence of a prerequisite program, including SOPs, be included in the district’s food safety plan. The checklist also identifies other prerequisites such as supplier assurance or approvals, sanitation practices, training, employee health and hygiene, chemicals, storage, pest, and temperature control. Prerequisite programs are the foundation of a HACCP plan and are basic operating conditions for producing safe food (NRAEF, 2008). A prerequisite checklist can be useful in determining areas of the school food safety plan that are less completely developed. Although this prerequisite program checklist was not included in the USDA guidance document (USDA-FNS, 2005a), it was readily available to school FSDs through ISU Extension and the NSFMI. Sneed and Henroid (2007) found 32% of respondents who used the prerequisite process checklist found it very useful, 65% rated the SOP check list as very useful (65%), and 71% found the documentation forms were very useful. With the exception of prerequisite programs, all the other listed components of a HACCP-based food safety plan were reported by three-fourths or more of the responding FSDs as ones with documentation in place. Findings are shown in Table 18.
Story (2008) reported 62% of respondents reported the purchase of bimetallic stem thermometers, 85% had purchased refrigerator thermometers, and 48% had purchased digital probes. Over 70% various thermometers were purchased prior to the implementation of their food safety plan, as they were aware to check temperatures of food products, and 20% indicated thermometers were purchased after the mandate. Cooling chill sticks were purchased by less than 25% of districts prior to or after the mandate. Story found thermometer calibration records were kept and calibrations varied by district, one district reporting calibration occurred one to two times per month and another district one to two times per day or as needed. Managers indicated logs were reviewed daily to verify the food safety plan was working; in one district the logs were signed after review, whereas the other district simply stated their logs were reviewed.

Critical control points are steps in the handling/cooking process where a control action is essential to assure food safety. Corrective action documentation records an action needed to be taken when a critical limit or standard was not met. Examples of the type of
corrective action that would be documented include rejection of dented cans at receiving, as per the SOP and established standard, or discarding of food from a refrigeration unit in which failure to maintain adequate cooling temperatures was noted in excess of four hours.

Completeness of the SOP for receiving was rated at less than 75% complete, an area where an occurrence of mishandling of foods should have documentation. Henroid and Sneed (2004) found in a study of Iowa schools prior to HACCP implementation that greater documentation was needed to verify appropriate food-handling practices were occurring in school meals programs. They noted recordkeeping of control points and critical control points was not found. Although FSDs in this study indicated documentation of critical control points occurred, prior research had not found that to be the case. The difference may be due to the elapse of time between studies and increased training about HACCP-based food safety plans.

The manager and foodservice staff share in the responsibilities of monitoring. Monitoring activities involve the act of observation to make sure critical limits are being met and maintained, whereas verification confirms your food safety plan is working. In this study, perhaps the FSDs just noted “yes” to each area of documentation or they did not understand what documentation practices involved. Results of semiannual health inspections continue to show similar lapses in food handling best practices as found in previous research. Results of this study are not consistent with Giampaoli, Sneed, et al.’s (2002), Sneed et al.’s (2004), or Henroid and Sneed’s (2004) observations of documentation of temperatures during prepreparation, cold holding, end-cooking temperatures, and reheating processes, as well as cooler/freezer temperatures and dishwasher temperatures. Specifically, thermometer calibration records (Sneed & Henroid, 2003) and temperature logs of food items were not
found (Giampaoli, Sneed, et al., 2002). Olds and Sneed (2005) recommended appropriate documentation procedures for cooling, and Giampaoli, Sneed, et al. (2002) suggested audits be conducted on an ongoing basis as part of the monitoring compliance. Sneed et al. (2004) also noted a verification process needed to be established in foodservices observed. Findings from this study are surprising as lower levels of adoption of documentation of prerequisite programs, a fundamental step in HACCP plan development, was found than for monitoring and verification documentation. Responses by FSDs about documentation are show in Table 18.

**Food Safety Concepts in Human Resources Management Procedures**

School FSDs responded to five questions about inclusion of food safety concepts in components of human resources management processes for staff: interview, orientation training, task lists, job description, and performance appraisals. FSDs indicated a response of “yes,” “no,” or “did not respond.” The majority of respondents indicated food safety concepts were included in all five of the listed processes of human resources management, with the number of “yes” responses ranging from 101 to 144. The highest reported inclusion of food safety concepts was noted for orientation ($n = 144$) and in specific task lists ($n = 134$); lowest inclusion was reported in interviews ($n = 106$) and performance appraisals ($n = 101$). Inclusion of food safety training in foodservice staff orientation suggests recognition by FSDs that fundamental knowledge about safe food handling is critical to protect health of students. However, it is interesting that food safety concepts are not part of the interview process. This may be due to the historical description of line-level foodservice jobs not requiring any specific knowledge or skills. The Healthy, Hunger – Free Kids Act of 2010 does specify the need for specific knowledge and skills, which eventually may mean a
transition from the workplace providing training to an expectation that new hires possess the necessary knowledge and skills prior to employment. It is also interesting, given that food safety training is included in most orientation programs, that there is no integration of this training into expectations for work performance through job descriptions or performance appraisals. Ideally, there should be alignment with posted job announcements, provided training, job descriptions, and performance reviews. Findings from this study show less frequent inclusion of food safety components in personnel processes could be caused by school district governance in which FSDs are not included in the interview process or FSDs not having control of performance reviews due to union organization contracts or the use of standardized district-wide forms for staff at specific classifications. What is not clear from these findings is whether written job descriptions for foodservice staff positions actually existed and which of the respondents actually had the authority and responsibility to create these and performance evaluation forms. Cross, Asperin, and Nettles (2009) conducted research to develop competency-based performance appraisals for evaluation of school nutrition managers and assistants. They indicated effective performance appraisals should have criteria: instructions, comment space, plan for improvement, and clearly defined expected performances, as well as include functions essential to their job, one being sanitation and safety for both school nutrition managers and assistants. Stinson et al. (2011) also suggested making food safety practices a part of the evaluation. Span of control and scope of authority and responsibility vary greatly among administrators of child nutrition programs in school districts. More frequent inclusion of food safety concepts noted by 134 FSDs in actual day-to-day operational aspects of the task lists suggests management control over these activities is in place to a certain degree.
Sanitation Inspections

In this section of the survey, FSDs responded to questions related to sanitation inspections in their districts for the 2007–2008 school year. The Child Nutrition and WIC Reauthorization Act of 2004 required that, effective at the start of the 2006 school year, districts participating in child nutrition programs were to receive two health inspections annually, post results of the inspection reports, and implement a food safety plan based on HACCP principles for each foodservice site where food is produced or served in the district. A total of 158 FSDs (95.2%) of the 166 completed surveys responded to two yes/no and three open-ended questions. In addition, FSDs identified which critical violations had been noted on the most recent inspection. The majority of FSDs responding to this section of the survey (94.3%, n = 149) indicated two written inspection reports were received annually by local health inspectors for their districts, a finding consistent with Stinson et al.’s (2011) study. However, this finding was not consistent with an article that appeared in USA TODAY (Eisler & Morrison, 2009), in which USDA data was cited that 30% of the 26,500 school building cafeterias across the nation lacked required semiannual inspections. A representative from the SNA responded to the story with several talking points posted on the SNA website and a comment that the SNA had been in conversations with the authors regarding food safety facts and practices (personal communication, D. Pratt-Heavner, SNA, December 19, 2009).

Inspection Fees for Additional Health Inspections

A total of 21 (13.7%) districts reported a fee, in excess of the current license fee which covers annual inspections, was charged by their regulatory agency for completion of the second health inspection. Therefore 86.3% of responding districts had not incurred added
costs for inspections, a finding similar to that of Story (2008). Of the 21 districts that were imposed an additional fee, 17 identified the amount charged. The reported fees to conduct two inspections per year as required by the Reauthorization Act of 2004 ranged from $35 (n = 1) to $7,884 (n = 1). The mean additional fee per district for semiannual inspections, based on the 17 districts that identified a fee, was $2,405. The median fee charged for these districts was $2,000. Story found similar fee ranges in her national study of school foodservice authorities’ perceived costs in implementing HACCP food safety plans, which FSDs reported as ranging from an additional $25 to $5,125. Although it is unclear whether the fees were charged by these regulatory agencies prior to the 2004 Act, findings indicated a significant financial burden was placed on some districts to comply with the mandated two inspections per year for each foodservice site in the district.

**Posting of the Inspection Reports**

The Reauthorization Act also required inspection reports to be posted in public view and available upon request. Of the 141 FSDs responding to the question regarding location of inspection reports, 36 indicated inspection reports were posted in two or more places. Surprisingly, 9 directors indicated inspection reports were not posted in any manner, including in school buildings, in district administration offices, or electronically on the districts’ web site. A total of 24 directors indicated compliance was achieved using alternate methods of dissemination by posting in school buildings, on the district’s web site, or submission of the health inspection report to the newspaper. The most frequently reported posting location for an inspection report in the district was in the cafeteria serving line (n = 98), foodservice kitchen (n = 27), or site manager’s office window (n = 21). Findings indicated there were multiple interpretations of what was meant by public view and
availability. The small percentage of districts that appeared to be in noncompliance suggests the need for further education and/or monitoring during state agency reviews of the programs.

The majority of FSD respondents (84.9%, $n = 141$) indicated a request for a copy of a health inspection report from the general public or nonschool representative had not been received. Of the remaining respondents, 10 (6.0%) directors stated a request had been made once, three directors (1.8%) reported requests had been received two to five times, and 12 FSDs did not respond to this question.

**Critical Violations Cited During Semiannual Health Department Inspections**

Findings from the directors in the Mid-Atlantic region who participated in this study supervised child nutrition programs in a mean number of 10 buildings per districts; a span of supervision similar to that identified in Rice’s (2007) study. In this study, a total of 1,522 school foodservice sites were under the direction of 155 FSDs. Of the 149 FSDs who identified critical violations had been noted in an inspection report for their districts, 28 indicated multiple types of violations with totals exceeding 90 counts. A list of violations categorized similar to the food code inspection reports were presented to FSDs on the survey. As shown in Table 19, FSDs identified categories of violations as: food temperatures ($n = 6$); faulty equipment (hot and cold production and holding, cleaning and sanitizing; $n = 25$); storage ($n = 10$); chemical handling (improper sanitizer concentrations; $n = 4$); hygiene practices ($n = 15$); and structural areas (interior and exterior facilities; $n = 31$).

Findings from this study of reported violations are similar to those noted in a longitudinal study of restaurants in Tennessee (Jones, Pavlin, La Fleur, Ingram, & Schaffner, 2004) and the Sports Arena in Washington (Jenkins-McLean, Skilton, & Sellers, 2004).
Table 19

*Foodservice Directors’ Identification of Critical Violations on Semiannual Inspection Reports (N = 28)*

<table>
<thead>
<tr>
<th>Violation</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food temperatures</td>
<td>6</td>
</tr>
<tr>
<td>Improper heating of foods</td>
<td>2</td>
</tr>
<tr>
<td>Holding of foods during serving times</td>
<td>3</td>
</tr>
<tr>
<td>Improper cooling of foods</td>
<td>1</td>
</tr>
<tr>
<td>Equipment</td>
<td>25</td>
</tr>
<tr>
<td>Faulty hot hold equipment</td>
<td>6</td>
</tr>
<tr>
<td>Cold holding equipment – missing thermometers</td>
<td>4</td>
</tr>
<tr>
<td>Thermometers not working</td>
<td>7</td>
</tr>
<tr>
<td>Dishwasher – temperature/thermometer</td>
<td>5</td>
</tr>
<tr>
<td>Sneeze guard – missing</td>
<td>1</td>
</tr>
<tr>
<td>Gaskets – missing or moldy</td>
<td>2</td>
</tr>
<tr>
<td>Storage</td>
<td>10</td>
</tr>
<tr>
<td>Improper storage of dry goods</td>
<td>4</td>
</tr>
<tr>
<td>Rusty/dented cans</td>
<td>3</td>
</tr>
<tr>
<td>Rodent droppings in areas</td>
<td>3</td>
</tr>
<tr>
<td>Chemicals</td>
<td>4</td>
</tr>
<tr>
<td>Sanitizer concentration – improper levels</td>
<td>4</td>
</tr>
<tr>
<td>Hygiene</td>
<td>15</td>
</tr>
<tr>
<td>Improper handwashing techniques</td>
<td>3</td>
</tr>
<tr>
<td>Hair restraints missing</td>
<td>1</td>
</tr>
<tr>
<td>Improper handling of food</td>
<td>1</td>
</tr>
<tr>
<td>Food contact surfaces - soiled</td>
<td>10</td>
</tr>
<tr>
<td>Physical facility</td>
<td>31</td>
</tr>
<tr>
<td>Water</td>
<td>7</td>
</tr>
<tr>
<td>Handsink temperature/ low pressure</td>
<td>8</td>
</tr>
<tr>
<td>Water quality</td>
<td>2</td>
</tr>
<tr>
<td>Back flow siphon</td>
<td>3</td>
</tr>
<tr>
<td>Paint peeling</td>
<td>3</td>
</tr>
<tr>
<td>Ceiling tiles – missing/soiled</td>
<td>1</td>
</tr>
<tr>
<td>Doors – non self -closures</td>
<td>1</td>
</tr>
<tr>
<td>Doors – missing door sweeps/screens/weather stripping</td>
<td>1</td>
</tr>
<tr>
<td>Restroom receptacles – not covered</td>
<td>1</td>
</tr>
<tr>
<td>Exterior</td>
<td>4</td>
</tr>
<tr>
<td>Dumpster- uncovered</td>
<td>1</td>
</tr>
<tr>
<td>Foundation cracks and gaps</td>
<td>3</td>
</tr>
</tbody>
</table>

*Note.* Multiple responses possible.
Violations identified in these commercial operations were for unclean nonfood equipment surfaces, walls/ceilings, and food-contact surfaces; inadequate food protection and door closures; improper sanitizing solutions; and improper storage of foods. Story’s (2008) study also noted the reported lack of compliance with HACCP-based food safety plans by FSDs with improper equipment along with needed facility repairs and maintenance identified as issues. Not all FSDs in the current study identified violations and corrective actions. A total of 41 FSDs reported action steps to correct identified critical violations: training of staff; discarding of improperly stored or heated food; removal, repair or replacement of faulty pieces of equipment; introducing integrated pest management practices; and correcting structural deficiencies, such as painting of ceiling tiles and closing gaps in foundations. It is interesting to note the three SOPs identified by most FSDs in this study as complete and implemented in the districts were also areas identified as the top three violations. These violations also have been reported in past research (FDA, 2000; Sneed et al., 2004). The FDA made the following recommendations for out-of-compliance risk factors: develop and implement SOPs specifically for time and temperature abuse and personal hygiene, and create measures to prevent food contamination. The FDA further recommended establishment of critical limits and methods to assess the effectiveness of the SOPs. Reported critical violations in school foodservices are shown in Table 19.

Foodservice Directors’ Perceived Organizational Support for Child Nutrition Programs from District Administration

School FSDs rated 17 items to assess their perceptions of administrative support for the child nutrition program in their districts. A 5-point Likert-type rating scale ranging from 1 (very unsupportive) to 5 (very supportive) was used. A total of 158 (95.0%) FSDs
responded to this section of the questionnaire. As shown in Table 20, the majority of FSDs identified five items for which they perceived strong support from the administration: implementing mandated laws ($M = 4.23$), crisis management ($M = 4.16$), maintaining kitchen and facilities ($M = 4.13$), meal price increases ($M = 4.03$), and personnel issues ($M = 4.01$).

Six items for which administration was viewed as somewhat supportive (mean ratings ranging from 3.82–3.97) were: facility use by outside groups, policy implementation, capital

Table 20

*Mean Ratings* and Standard Deviations of Foodservice Directors’ Perceptions of Administrative Support for Foodservice Operational Issues ($N = 158$)

<table>
<thead>
<tr>
<th>Operational issues</th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementing mandated laws</td>
<td>4.23</td>
<td>0.95</td>
</tr>
<tr>
<td>Crisis management</td>
<td>4.16</td>
<td>0.92</td>
</tr>
<tr>
<td>Maintaining kitchen and facilities</td>
<td>4.13</td>
<td>0.84</td>
</tr>
<tr>
<td>Meal price increases</td>
<td>4.03</td>
<td>1.10</td>
</tr>
<tr>
<td>Personnel issues</td>
<td>4.01</td>
<td>1.03</td>
</tr>
<tr>
<td>Policy implementation</td>
<td>3.97</td>
<td>1.0</td>
</tr>
<tr>
<td>Capital purchases greater than $500.00</td>
<td>3.96</td>
<td>1.09</td>
</tr>
<tr>
<td>Training opportunities for school foodservice</td>
<td>3.95</td>
<td>1.08</td>
</tr>
<tr>
<td>Staffing needs</td>
<td>3.91</td>
<td>1.07</td>
</tr>
<tr>
<td>Community response to program changes</td>
<td>3.86</td>
<td>1.03</td>
</tr>
<tr>
<td>Student charging of meals</td>
<td>3.82</td>
<td>1.01</td>
</tr>
<tr>
<td>Facility use by outside groups</td>
<td>3.82</td>
<td>1.08</td>
</tr>
<tr>
<td>Increases to annual foodservice budget</td>
<td>3.79</td>
<td>1.22</td>
</tr>
<tr>
<td>Funding operating costs i.e. garbage and utilities</td>
<td>3.72</td>
<td>1.45</td>
</tr>
<tr>
<td>Financial support for foodservice fund</td>
<td>3.37</td>
<td>1.55</td>
</tr>
<tr>
<td>Negative balance of monthly financial reports</td>
<td>3.20</td>
<td>1.54</td>
</tr>
<tr>
<td>Negative net operating income</td>
<td>2.91</td>
<td>1.61</td>
</tr>
</tbody>
</table>

*Based on a rating of 5 = very supportive, 4 = generally supportive, 3 = neither supportive or unsupportive, 2 = unsupportive, 1 = very unsupportive.*
purchases greater than $500, training opportunities for school foodservice, staffing needs, community response to program changes, and student charges of meals. FSDs in contracted management foodservice programs responded with greater levels of perceived support \( (M = 4.23, SD = .546) \) than did self-operated program directors \( (M = 3.85, SD = .744) \), and other findings showed there was less perceived support (mean ratings below 3.80) for financial-related matters or items requiring monetary inputs, such as increases to the annual foodservice budget \( (M = 3.79) \), financial support for the foodservice fund \( (M = 3.37) \), negative balance in the monthly financial reports \( (M = 3.20) \), and negative net operating income \( (M = 2.91) \). These findings could be reflective of an administrative view that the child nutrition program should be self-supporting and that general fund money should not be taken away from educational purposes.

March and Gould (2002) found administrative support was provided in the form of assistance with meal-time supervision (92%) and general child nutrition program support (90%). Wilson (2007) found foodservice employees perceived organizational support from school administration as neutral. Story (2008) found in a case study of two districts that there was strong perceived support from the superintendent and board of education but neutral perceived support from the facilities department. She also found perceived support by foodservice management from administration in staff release time and site-based training for food safety, approval of job descriptions that required foodservice staff to recertify every three years, and board-level policies supporting a safe food environment. In this current study, SBOs recognized that training and documentation were an important component of the school food safety plan, yet were neutral on the importance of training for the entire foodservice staff \( (M = 2.76) \), as only 14.8% of responding SBOs reported funding from the
general fund was used for training for school foodservice staff. Although FSDs felt SBOs were supportive of foodservice staff training opportunities ($M = 3.95$), funding levels did not mirror their perceptions. SBOs in this study also reported minimum training hours of 3.1 hours for noncertified staff and close to 5 hours for certified staff were provided by the districts. This is different from the *SNA 2009 Operations Report* (SNA, 2009), which noted noncertified staff received an average of 8 hours training, with the majority of responses indicating kitchen managers received between 10 and 14 hours of training, more than double the number of hours found in this study. Findings from this study suggest school districts in the Mid-Atlantic region provide fewer training hours for staff than what has been reported nationally and provide little financial support for training. Research has noted that school foodservice staff should receive professional development on topics that support the school nutrition environment (O’Toole et al., 2007).

**School Foodservice Directors’ Attitudes about Food Safety Training**

Attitudes held by FSDs about food safety training were assessed. FSDs responded to seven positively and negatively phrased statements about food safety training using a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Negatively phrased statements were reverse coded. As shown in Table 21, almost all of the respondents rated the statement “I feel food safety training is important” with a “4” ($n = 7$) or “5” ($n = 150$) on the 5-point rating scale with a mean rating of 4.94. In addition, almost all rated the statement “Knowing proper procedures is an important part of food safety training” as one with which they agreed or strongly agreed with a mean rating of 4.84. The theme that food safety training is important was evident with other statements being rated between 4.39 to 4.94 and an overall mean for all items of 4.68. Internal consistency and reliability were
assessed for the FSDs’ attitudes toward food safety training items. The Cronbach’s alpha coefficient for attitude was .908, indicating an extremely high level of internal consistency and reliability. FSDs indicated in their opinions that food safety training helped staff develop professionally ($M = 4.78$), which, given the new requirements of the Healthy, Hunger-Free Kids Act of 2010 (USDA, 2011b), is important. Only two FSDs rated all items with all fives. Given that three of the statements were negatively stated, it could be speculated that perhaps the statements were not read carefully, respondents did not consider their assessment, or were

Table 21

*Foodservice Directors’ Attitudes Toward Food Safety Training (N = 166)*

<table>
<thead>
<tr>
<th></th>
<th>Ratings(^a)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>M</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel food safety training is important ($n = 158$)</td>
<td>150</td>
<td>94.94</td>
<td>7</td>
<td>4.43</td>
<td>1</td>
<td>0.63</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Knowing proper procedures is an important part of food safety training ($n = 160$)</td>
<td>137</td>
<td>85.63</td>
<td>20</td>
<td>12.50</td>
<td>3</td>
<td>1.88</td>
<td>0</td>
<td>0.00</td>
<td>0</td>
</tr>
<tr>
<td>Food safety training helps my staff develop professionally ($n = 158$)</td>
<td>128</td>
<td>81.01</td>
<td>26</td>
<td>16.46</td>
<td>3</td>
<td>1.90</td>
<td>1</td>
<td>0.63</td>
<td>0</td>
</tr>
<tr>
<td>The safety of food served to children in my district can be ensured by trained staff ($n = 159$)</td>
<td>122</td>
<td>76.73</td>
<td>31</td>
<td>19.50</td>
<td>5</td>
<td>3.14</td>
<td>1</td>
<td>0.63</td>
<td>0</td>
</tr>
<tr>
<td>I do not feel the responsibility to provide food safety training to my staff(^b) ($n = 159$)</td>
<td>126</td>
<td>79.25</td>
<td>18</td>
<td>11.32</td>
<td>3</td>
<td>1.89</td>
<td>5</td>
<td>3.14</td>
<td>7</td>
</tr>
<tr>
<td>Food safety training is not needed for my staff (^b) ($n = 157$)</td>
<td>120</td>
<td>76.43</td>
<td>21</td>
<td>13.38</td>
<td>5</td>
<td>3.18</td>
<td>4</td>
<td>2.55</td>
<td>7</td>
</tr>
<tr>
<td>Providing opportunities to staff to practice a new skill is not necessary(^b) ($n = 160$)</td>
<td>111</td>
<td>69.38</td>
<td>26</td>
<td>16.25</td>
<td>8</td>
<td>5.00</td>
<td>5</td>
<td>3.13</td>
<td>10</td>
</tr>
</tbody>
</table>

\(^a\)Rating scale used: 5 = strongly agree, 4 = agree, 3 = neither agree nor disagree, 2 = disagree, and 1 = strongly disagree. \(^b\)Negatively phrased items were reverse coded.
not vested in the project. Findings overall suggest responding FSDs had very positive attitudes toward food safety practices.

Giampaoli, Sneed, et al. (2002) previously had found positive responses and perceived advantages by FSDs to certification and food safety education. These researchers found FSDs perceived food safety certification as one means to ensure food was served safely in the schools and that staff with certification practiced safe food behaviors more frequently. Henroid and Sneed (2004) and Sneed et al. (2004) found managers with certification had higher knowledge scores and more favorable attitudes toward food safety than did those without food safety certification. FSDs in this study rated continued education in food safety as important and had a positive attitude toward learning about food safety and training for staff as a means to improve safe food handling practices. This finding is consistent with results from Youn and Sneed’s (2002) study, which found respondents strongly agreed that foodservice staff needed more training to improve food safety practices.

Sullivan, Harper, and West (2002) studied training needs of site managers in school foodservice and found there was a need for practical skills training such as the “how to” of properly cooling, heating, thawing, and preparing foods. This current study yielded similar findings in that time and temperature abuse of foods, such as inappropriate cold food holding, lack of proper hygiene practices, and improperly working equipment, were identified as needs. Continuous food safety education is necessary for both managers and staff. Research has shown high knowledge scores about safe food practices were not necessarily consistent with observed staff food-handling behaviors (Henroid & Sneed, 2004; Sneed et al., 2004). Thus, continual training is needed to improve food safety practices and to ensure documentation of the food safety process as part of HACCP plans become a priority in
The Healthy, Hunger-Free Kids Act of 2010 established training requirements for those involved with child nutrition programs. These requirements included annual training in administrative procedures for a representative from each local educational agency and annual training and certification for all local foodservice staff in program compliance, nutrition, and food safety practices.

In conversations with FSDs and school nutrition professionals, the FNS found perceived needs for greater support from school and district personnel, including teachers, principals, and superintendents, to implement and enforce LWPs (USDA-FNS, U.S. Department of Education, & CDC, 2011). The FNS also found in conversations with school administration and school boards of directors that there is a need for standardized tools for implementation, monitoring, and reporting about LWPs, evaluation guidance, and suggested model polices. Although the focus of this data pertains to LWPs, the foundation and premise is easily transferred to support for school food safety plans. These plans need support from the school administration for resources and funding, training opportunities, and assistance in district-wide implementation.

**Training Opportunities**

The FSDs indicated when training was typically provided and whether listed topics were included by responding with a “yes” or “no.” As shown in Table 22, the majority (83.7%, n = 139) of FSDs indicated that training had been conducted. Training occurred predominately during the school year (n = 129, 77.71%); however, 68 FSDs indicated
summer sessions were also provided. These may be offered through the state agency. The directors who indicated training occurred away from the district \((n = 49)\) may have been referencing state agency sponsored sessions in their responses. Some districts did hold food safety trainings during school in-service days \((n = 51)\), although it is not clear whether these were full-day sessions or sessions of a few hours.

Sullivan et al. (2002) found highly preferred methods of training delivery were theme-based seminars, state agency sponsored conference/workshops, and sessions sponsored by the foodservice industry. Story (2008) found two-thirds of the FSDs in her study conducted food safety training courses and that state agencies, such as health departments or departments of education also provided trainings. Training workshops provided by state agencies or vendors or conducted by the FSD were likely to be lower in cost due to outside funding or sponsorship, thus minimizing budgetary concerns. The potential need to pay staff for time at and away from school can impact foodservice departments’ operating budgets.

Table 22

Foodservice Directors’ Responses Regarding Scheduled Food Safety Training \((N = 166)\)

<table>
<thead>
<tr>
<th>Food safety training venues</th>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>%</td>
<td>(n)</td>
<td>%</td>
</tr>
<tr>
<td>During the school year</td>
<td>129</td>
<td>77.71</td>
<td>23</td>
<td>13.86</td>
</tr>
<tr>
<td>Only during school in-service day</td>
<td>51</td>
<td>30.72</td>
<td>72</td>
<td>43.37</td>
</tr>
<tr>
<td>Away from district</td>
<td>49</td>
<td>29.52</td>
<td>76</td>
<td>45.78</td>
</tr>
<tr>
<td>During the summer</td>
<td>68</td>
<td>40.96</td>
<td>60</td>
<td>36.75</td>
</tr>
<tr>
<td>Food safety training was not provided</td>
<td>4</td>
<td>2.41</td>
<td>87</td>
<td>52.41</td>
</tr>
</tbody>
</table>
Training Topics

As shown in Table 23, six training topics were identified by over 90% of respondents as part of food safety training for school foodservice personnel: use of food thermometers, bare hand contact of ready-to-eat food, hand washing, and personal health and hygiene ($n = 156, 93.97\%$), hot and cold food holding ($n = 154, 92.8\%$), and cooling techniques ($n = 151, 91.0\%$). Other frequently offered training topics (identified as included in training sessions by more than 80% of respondents) were: thermometer calibration and reheating of leftovers ($n = 149, 89.8\%$), storage procedures ($n = 148, 89.2\%$), sanitizing solutions ($n = 147, 88.7\%$), recordkeeping and chemical storage ($n = 144, 86.57\%$), corrective actions ($n = 139, 83.7\%$), and critical control points and monitoring ($n = 138, 83.1\%$).

Story (2008) found food safety training for both foodservice staff and site level managers had increased between 2005 and 2007, with more food safety training provided to staff than in years prior to 2004, the year in which HACCP-based food safety plans were included in child nutrition program reauthorization. Topics identified by 90% or more of respondents in Story’s study as being included in food safety trainings were: safe cooling, holding temperature, food safety principles, hygiene, and time and temperature abuse. Other topics reported by some of participants in both Story’s and this current study were allergies and chemical use and storage. Interestingly, two topics frequently covered in the popular press yet not identified as frequently included in foodservice staff training were allergens ($n = 110, 66.27\%$) and food recalls ($n = 107, 64.46\%$). Increased prevalence of allergens in school-age children has been recognized by USDA and the scientific community as a concern. Responses from the SBO survey on the topic of allergy awareness were similar to those from the FSD survey. Managers must train staff on food handling, cleaning, and
Table 23

*Foodservice Directors’ Identification of Topics Included in Foodservice Staff Food Safety Training (N = 166)*

<table>
<thead>
<tr>
<th>Food safety training components</th>
<th>Yes</th>
<th>No</th>
<th>Do not know</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bare hand contact of ready-to-eat foods</td>
<td>156</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Handwashing</td>
<td>156</td>
<td>2</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Personal health and hygiene</td>
<td>156</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Use of food thermometers</td>
<td>156</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Hot and cold food holding</td>
<td>154</td>
<td>2</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Cooling techniques</td>
<td>151</td>
<td>6</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Reheating of leftovers</td>
<td>149</td>
<td>4</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Thermometer calibration</td>
<td>149</td>
<td>9</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Storage procedures</td>
<td>148</td>
<td>9</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>Sanitizing solutions</td>
<td>147</td>
<td>7</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Chemical storage</td>
<td>144</td>
<td>8</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Recordkeeping</td>
<td>144</td>
<td>12</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Corrective actions</td>
<td>139</td>
<td>11</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Monitoring procedures</td>
<td>138</td>
<td>14</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Critical control points</td>
<td>138</td>
<td>13</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Critical limits</td>
<td>132</td>
<td>15</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Self-inspection</td>
<td>127</td>
<td>19</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Recipe processes</td>
<td>125</td>
<td>27</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>Standardizing recipes</td>
<td>125</td>
<td>25</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Allergens</td>
<td>110</td>
<td>36</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Food recall procedures</td>
<td>107</td>
<td>40</td>
<td>6</td>
<td>13</td>
</tr>
</tbody>
</table>
sanitizing practices to avoid cross-contamination of potential food allergens; how to read food ingredient labels (Massachusetts Department of Education, 2002); and the ability to recognize symptoms of anaphylaxis (Sampson et al., 2005). In addition, the increased prevalence of allergens presents operational issues to child nutrition programs as reported in SNA 2010 Back to School Trends Report (SNA, 2010). Survey data for the current study was collected in 2008, prior to the release of Food Code 2009 (FDA, 2009), which stipulated all workers in a foodservice setting should have an understanding of common food allergens. Thus, allergens may currently be included by more districts in trainings provided to foodservice personnel than what was found at the time of data collection. Also since the time of data collection, USDA (2009b) released a guidance document for districts to meet the needs of children with special dietary needs, including allergens. Currently, four of the six states in the Mid-Atlantic region have food allergy management guidelines. Nationally, there are about 15 states with the same guidance (Food Allergy Initiative, 2011). 2010-2011 Pennsylvania School Laws and Rules of (Levin, 2010), the most current update to the Public School Code of 1949, mandates the Department of Education to develop guidance for managing life-threatening food allergies in schools as a component of the LWP (Pennsylvania Public School Code of 1949, 2011). The less frequent inclusion of food recalls as a training topic could be due to directors’ feelings this was a management or central office response and staff did not need to know if a recall had occurred.

**Personal Food Safety Practices of School Foodservice Directors**

The FSDs disclosed their personal food safety practices used at home for food purchasing, storage, preparation, and cooking. Respondents answered one open-ended question and two yes/no questions and rated three categories of items using a 5-point Likert-
type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Tables 24 through 29 show FSDs’ responses to questions about food safety practices used in their homes.

**Bleach Storage**

Respondents (n = 94, 60.3%) identified their primary storage location for chlorine bleach by responding to an open-ended question. As shown in Table 24, frequent responses indicated storage was in the laundry room area or a combination of laundry, kitchen, and bath (n = 16, 10.3%). Six respondents indicated they stored chlorine bleach in the kitchen area. A chlorine bleach solution can be a reliable disinfecting and sanitizing agent beyond the laundry and can kill common food pathogens such as *Campylobacter* spp., *Salmonella* spp., and *E. coli* 0157:H7 that may be present on sinks, preparation areas, and counters. Chlorine-based sanitizing solutions are one of three chemical types approved by the food code for use in commercial kitchens. It is likely FSDs supervise the use of this or some type of sanitizing agent at work; however, the findings suggest there is limited application of this practice in home kitchens.

Table 24

*Foodservice Directors’ Personal Food Safety Practices Related to Bleach Storage at Home (N = 156)*

<table>
<thead>
<tr>
<th>Storage of bleach at home</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laundry room</td>
<td>94</td>
<td>60.26</td>
</tr>
<tr>
<td>Basement</td>
<td>22</td>
<td>14.10</td>
</tr>
<tr>
<td>Combined response: Laundry/kitchen/bath</td>
<td>16</td>
<td>10.26</td>
</tr>
<tr>
<td>Do not use</td>
<td>8</td>
<td>5.13</td>
</tr>
<tr>
<td>Sink</td>
<td>8</td>
<td>5.13</td>
</tr>
<tr>
<td>Kitchen sink</td>
<td>6</td>
<td>3.85</td>
</tr>
<tr>
<td>Storeroom/garage</td>
<td>2</td>
<td>1.28</td>
</tr>
</tbody>
</table>

*Note.* Multiple responses were possible.
**Thermometer Use**

The FSDs were also asked about the type of thermometers used at home. As shown in Table 25, more than 55% of the 166 respondents reported use of thermometers at home to check hot and cold food temperatures as well as in refrigerator and freezer storage. The bimetallic stemmed thermometer was the type indicated as used most often \( (n = 112, 67.5\%) \) followed by refrigerator/freezer thermometers \( (n = 109, 65.7\%) \). One component of the consumer targeted Fight BAC!\textsuperscript{®} campaign is cooking foods to proper temperatures in order to kill harmful bacteria that cause illness (Partnership for Food Safety Education [PFSE], 1997). Use of a food thermometer is one method of accurately measuring internal temperatures to be sure products are thoroughly cooked, as color is not an accurate indicator of doneness for ground meats. A refrigerator thermometer ensures temperature is consistently 40°F or below, the recommended range for foods that are temperature controlled for safety.

<table>
<thead>
<tr>
<th>Thermometer types</th>
<th>Yes</th>
<th>No</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( n )</td>
<td>( % )</td>
<td>( n )</td>
</tr>
<tr>
<td>Bimetallic-stemmed</td>
<td>112</td>
<td>67.47</td>
<td>30</td>
</tr>
<tr>
<td>Refrigerator/Freezer</td>
<td>109</td>
<td>65.66</td>
<td>31</td>
</tr>
<tr>
<td>Oven</td>
<td>103</td>
<td>62.05</td>
<td>35</td>
</tr>
<tr>
<td>Digital</td>
<td>80</td>
<td>48.19</td>
<td>52</td>
</tr>
</tbody>
</table>

*Note.* Multiple responses were possible.
**Cutting Board Use**

The FSDs were asked about type and use of cutting boards at home. As shown in Table 26, almost all of the respondents \((n = 158, 95.2\%)\) reported having cutting boards available for use at home. Polyethylene/synthetic was the most frequently identified material used \((n = 145, 87.3\%)\). It was interesting that FSDs reported use of wooden cutting boards at home \((n = 55, 33.1\%)\) as this material is not allowed in retail foodservices. Flexible mat (rubber type material) cutting boards also were identified frequently as a type used at home \((n = 42, 25.3\%)\).

Prior research has shown the material composition of the cutting board is important; however, cutting boards of any material can develop cuts and grooves from knives over time, providing a place for food debris and bacteria to grow and reproduce. Knife-scarred cutting boards are more difficult to clean and sanitize. Previous research by the International Food Information Council Foundation (2010) found proper use and cleaning procedures were followed by few consumers, resulting in contamination potential between raw and ready-to-eat foods prepared at home. Story (2008) noted in a national survey of school districts that

<table>
<thead>
<tr>
<th>Cutting board types</th>
<th>Yes</th>
<th>No</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n)</td>
<td>%</td>
<td>(n)</td>
</tr>
<tr>
<td>Polyethylene/synthetic</td>
<td>145</td>
<td>87.35</td>
<td>11</td>
</tr>
<tr>
<td>Wooden</td>
<td>55</td>
<td>33.13</td>
<td>67</td>
</tr>
<tr>
<td>Flexible</td>
<td>42</td>
<td>25.30</td>
<td>73</td>
</tr>
<tr>
<td>Disposable</td>
<td>16</td>
<td>9.4</td>
<td>93</td>
</tr>
</tbody>
</table>

*Note.* Multiple responses were possible.
color-coded cutting boards were used infrequently. Color-coded cutting boards provide visual cues to staff to reinforce concepts related to separation of raw and ready to eat foods. Findings from the current study suggest even professionals in foodservice management do not report application of best practice at home.

**Foodservice Directors Reported Food Safety Practices at Home**

The FSDs rated level of agreement to food safety practices using a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). There were three scales included in this section on food safety practices at home: shopping (GS), home storage (HS), and home food prep (HP). Prior to the analysis of each scale, the items in each scale were submitted to reliability analysis using Cronbach’s alpha. This was done to ensure coding of each item was scaled in the appropriate direction, because some of the items included the use of the word not or were negatively phrased. Of the nine items in the GS scale five negatively phrased items were recoded. The Cronbach’s alpha reliability coefficient for the GS scale with the recoded items was .160. There were six items in the HS scale with one negatively phrased item recoded. The Cronbach’s alpha reliability coefficient for the HS scale with the recoded items was .506. There were 12 items in the HP scale and 6 items were recoded. The Cronbach’s alpha reliability coefficient for the recoded items for the HP scale was .595. Means were calculated for each item and an overall mean for each separate category of items, GS, HS, and HP, was calculated.

**Grocery shopping.** The number, percentage, and means of responses for GS items, the FSDs reported levels of agreement with recommended food safety practices while shopping for personal grocery items, are shown in Table 27. The FSDs reported positive shopping practices with the highest mean ratings of agreement with the statements about
keeping raw meats and poultry separate from fresh fruits and vegetables in the cart \( (M = 4.53) \), avoidance of comingling cleaning agents and food items in shopping carts \( (M = 4.16) \), shopping for frozen foods at the end of shopping trip \( (M = 4.34) \), and purchasing products by date \( (M = 4.45) \). The FSDs did not always report out-of-date items to the customer service center in the store \( (M = 2.85) \) and left out-of-code products on the shelves \( (M = 4.04) \). The

Table 27

*Foodservice Directors’ Reported Level of Agreement with Grocery Shopping Scale Items (\( N = 166 \))*

<table>
<thead>
<tr>
<th>Grocery Shopping scale item</th>
<th>SA n</th>
<th>SA %</th>
<th>A n</th>
<th>A %</th>
<th>A/D n</th>
<th>A/D %</th>
<th>D n</th>
<th>D %</th>
<th>SD n</th>
<th>SD %</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>The grocery store is my first stop when running errands (^b)</td>
<td>11</td>
<td>7.00</td>
<td>8</td>
<td>5.09</td>
<td>42</td>
<td>26.75</td>
<td>28</td>
<td>17.83</td>
<td>68</td>
<td>43.31</td>
<td>3.85</td>
<td>1.23</td>
</tr>
<tr>
<td>I check expiration dates of foods in the store, but leave out-of-date items on the shelf</td>
<td>79</td>
<td>50.31</td>
<td>38</td>
<td>24.20</td>
<td>19</td>
<td>12.01</td>
<td>9</td>
<td>5.73</td>
<td>12</td>
<td>7.64</td>
<td>4.04</td>
<td>1.24</td>
</tr>
<tr>
<td>I purchase out-of-date items for immediate use (^b)</td>
<td>5</td>
<td>3.18</td>
<td>2</td>
<td>1.27</td>
<td>12</td>
<td>7.64</td>
<td>36</td>
<td>22.93</td>
<td>102</td>
<td>64.97</td>
<td>4.45</td>
<td>.92</td>
</tr>
<tr>
<td>I do not place refrigerated items such as meat, poultry, and dairy foods in the cart first</td>
<td>73</td>
<td>46.20</td>
<td>35</td>
<td>22.15</td>
<td>27</td>
<td>17.09</td>
<td>9</td>
<td>5.57</td>
<td>14</td>
<td>8.86</td>
<td>3.91</td>
<td>1.28</td>
</tr>
<tr>
<td>I keep packages of raw meat and poultry separate from bags of fresh fruits and vegetables</td>
<td>112</td>
<td>70.44</td>
<td>29</td>
<td>18.24</td>
<td>10</td>
<td>6.29</td>
<td>6</td>
<td>3.77</td>
<td>2</td>
<td>1.26</td>
<td>4.53</td>
<td>0.87</td>
</tr>
<tr>
<td>I shop for frozen foods at beginning of my shopping trip (^b)</td>
<td>5</td>
<td>3.16</td>
<td>6</td>
<td>3.79</td>
<td>16</td>
<td>10.13</td>
<td>34</td>
<td>21.52</td>
<td>97</td>
<td>61.39</td>
<td>4.34</td>
<td>1.02</td>
</tr>
<tr>
<td>I do not keep packages of cleaning agents separate from food products (^b)</td>
<td>92</td>
<td>58.59</td>
<td>27</td>
<td>17.19</td>
<td>21</td>
<td>13.37</td>
<td>6</td>
<td>3.82</td>
<td>11</td>
<td>7.00</td>
<td>4.16</td>
<td>1.21</td>
</tr>
<tr>
<td>During warm weather, I do not bring a cooler filled with ice to keep purchases frozen/refrigerated foods at a proper temperature because my drive is greater than 15 minutes (^b)</td>
<td>55</td>
<td>35.71</td>
<td>16</td>
<td>10.38</td>
<td>39</td>
<td>25.32</td>
<td>22</td>
<td>14.28</td>
<td>22</td>
<td>14.28</td>
<td>3.38</td>
<td>1.45</td>
</tr>
<tr>
<td>I report out-of-date items to customer service center of the store</td>
<td>36</td>
<td>23.53</td>
<td>25</td>
<td>16.33</td>
<td>44</td>
<td>28.75</td>
<td>22</td>
<td>14.37</td>
<td>26</td>
<td>16.99</td>
<td>2.85</td>
<td>1.38</td>
</tr>
</tbody>
</table>

\(^a\)Rating scale: SA = strongly agree, A = agree, A/D = neither agree nor disagree, D = disagree SD = strongly disagree. \(^b\)Negatively phrased items reverse coded.
FSDs varied in their levels of agreement to timing of their shopping trips with over half disagreeing it was their first stop in running errands ($M = 3.85$). Findings may be distorted due to particular situations of the FSDs. In some cases, a trip to the grocery store is a relatively short distance from the home, thus there is not a need for a cooler in warmer weather, or there may not have been consistent understandings of the statement. The overall mean for the GS items for all the respondents was 3.95.

**Home Storage.** FSD’s rated level of agreement to six positively and negatively phrased items in the HS scale about storage of food and nonfood items at home, using the same 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The overall mean for these questions was 4.15. As shown in Table 28, the FSDs reported positive home storage practices including keeping chemical agents in original containers ($M = 4.77$) and thermometers in the refrigerator to monitor cold storage ($M = 3.70$). However, there was less vigilance noted on whether the refrigerated storage temperature was checked daily ($M = 2.81$). Although just over one fourth of respondents either strongly agreed ($n = 29, 18.2\%$) or agreed ($n = 18, 11.6\%$) to statements about checking refrigerator temperature daily, this is a larger percentage than the findings in a national study conducted by the Fight BAC!® organization, the Partnership of Food Safety Education in 1997. In the earlier study, only 20% of consumers actually used thermometers in the refrigerator. The FSDs self-reported that they covered leftovers ($M = 4.55$), kept raw meats and poultry separate from fresh fruits and vegetables ($M = 4.66$), and canned foods and nonperishables are not the first foods unpacked ($M = 4.43$). Fight BAC!® suggests refrigerating or freezing perishables such as meat, poultry, and eggs as soon as one returns home from the store. Increased frequencies of the number and percentage of responses indicating high levels of agreement with these
Table 28

*Foodservice Directors’ Personal Food Safety Storage Practices of Food Items at Home (N = 166)*

<table>
<thead>
<tr>
<th>Home Storage scale item</th>
<th>Ratings&lt;sup&gt;a&lt;/sup&gt;</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have a thermometer inside the refrigerator</td>
<td>SA</td>
<td>n</td>
<td>%</td>
<td>A</td>
<td>n</td>
<td>%</td>
<td>A/D</td>
<td>n</td>
</tr>
<tr>
<td></td>
<td>81</td>
<td>50.94</td>
<td>25</td>
<td>15.72</td>
<td>3</td>
<td>1.86</td>
<td>25</td>
<td>15.72</td>
</tr>
<tr>
<td>I store leftovers uncovered in the refrigerator</td>
<td>6</td>
<td>3.75</td>
<td>0</td>
<td>0.0</td>
<td>6</td>
<td>3.75</td>
<td>35</td>
<td>21.87</td>
</tr>
<tr>
<td>I check the refrigerator thermometer daily</td>
<td>29</td>
<td>18.24</td>
<td>18</td>
<td>11.32</td>
<td>38</td>
<td>23.89</td>
<td>41</td>
<td>25.79</td>
</tr>
<tr>
<td>I store raw meat/poultry together in refrigerator drawers with fresh fruits and vegetables</td>
<td>6</td>
<td>3.75</td>
<td>1</td>
<td>0.62</td>
<td>1</td>
<td>0.62</td>
<td>24</td>
<td>15.00</td>
</tr>
<tr>
<td>I keep chemicals in the original containers</td>
<td>132</td>
<td>82.50</td>
<td>22</td>
<td>13.75</td>
<td>2</td>
<td>1.87</td>
<td>1</td>
<td>0.62</td>
</tr>
<tr>
<td>When I return home from shopping, non-refrigerated foods, such as canned goods are put away first&lt;sup&gt;b&lt;/sup&gt;</td>
<td>8</td>
<td>5.00</td>
<td>1</td>
<td>0.62</td>
<td>9</td>
<td>5.62</td>
<td>37</td>
<td>23.12</td>
</tr>
</tbody>
</table>

<sup>a</sup>Rating scale: SA = strongly agree, A = agree, A/D = neither agree nor disagree D = disagree SA = strongly disagree. <sup>b</sup>Negatively phrased item reverse coded.

Statements were expected given the educational level and food safety training reported by FSDs. The lower than expected levels of agreement to recommended food safety practices may be due to a less active monitoring role at home or presumed decline in risk given less amount of foods and ages served. Findings from this survey on home storage can be found in Table 28.

**Home Preparation.** The FSDs rated 12 positively and negatively phrased statements about food preparation and cooking at home on the HP scale using the same 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Six of the items were reverse-coded. Directors indicated they used recommended preparation and good cooking practices at home with an overall mean of 4.30 calculated for the 12 items. As shown in
Table 29, the FSDs reported hands were washed before starting food preparation ($M = 4.81$). Cutting boards were reported as being washed in hot soapy water and rinsed between uses ($M = 4.58$) and placed into the dishwasher for cleaning ($M = 4.07$) rather than just brushing crumbs away ($M = 4.76$). FSDs also used different cutting boards at home for raw meats and fresh produce ($M = 4.06$). Other recommended practices identified as used at home were the use of a different plate for holding cooked meat than the one used for raw meats when grilling ($M = 4.76$), not thawing foods on counters ($M = 4.62$) or cooling cooked foods on counters ($M = 4.07$). Food was not thawed partially in the microwave and then placed in the refrigerator ($M = 4.00$); partial cooking or thawing in the microwave does run the risk of temperature abuse of foods. Both Fight BAC!® (PFSE, 1997) and the food code (FDA, 2005) recommend microwave ovens be used to thaw foods only if these foods are to be cooked immediately. Clearly, food safety training messages about cross-contamination and improper cooling risks in schools have been heard with FSDs reporting these safe practices at home. In addition, both references caution against food resting on the counters at room temperature for more than 2 hours. Findings from this study indicate both of these flawed practices appear to be occurring in FSDs’ homes. The FSDs were less in agreement about practices of checking end-point cooking temperatures with thermometers on foods prepared in the microwave ($M = 3.15$) or in checking temperatures of meat, poultry, and fish ($M = 4.23$). Although appearances may indicate a product is completely cooked, microwave ovens do not heat evenly, thus appearances may be deceiving. These findings suggest further re-education on the use of thermometers is needed.
### Table 29

**Foodservice Directors’ Preparation and Cooking Practices for Food at Home (N = 166)**

<table>
<thead>
<tr>
<th>Home Preparation scale item</th>
<th>Ratings&lt;sup&gt;a&lt;/sup&gt;</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>I wash my hands before starting food preparation</td>
<td>135</td>
<td>84.91</td>
<td>20</td>
<td>12.57</td>
<td>2</td>
<td>1.26</td>
<td>2</td>
</tr>
<tr>
<td>I thaw foods partly in the microwave and then thaw the rest of the way in the refrigerator&lt;sup&gt;b&lt;/sup&gt;</td>
<td>14</td>
<td>8.88</td>
<td>9</td>
<td>5.66</td>
<td>22</td>
<td>13.84</td>
<td>32</td>
</tr>
<tr>
<td>I use a different cutting board for raw meats and fresh produce</td>
<td>89</td>
<td>55.26</td>
<td>28</td>
<td>17.50</td>
<td>17</td>
<td>10.63</td>
<td>15</td>
</tr>
<tr>
<td>I just brush off the cutting board before putting away&lt;sup&gt;b&lt;/sup&gt;</td>
<td>3</td>
<td>1.85</td>
<td>1</td>
<td>0.62</td>
<td>1</td>
<td>0.62</td>
<td>21</td>
</tr>
<tr>
<td>I wash the cutting board in hot soapy water and rinse between uses</td>
<td>119</td>
<td>75.31</td>
<td>28</td>
<td>17.72</td>
<td>2</td>
<td>1.26</td>
<td>2</td>
</tr>
<tr>
<td>I only rinse knives between uses&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4</td>
<td>2.56</td>
<td>8</td>
<td>5.13</td>
<td>7</td>
<td>4.48</td>
<td>28</td>
</tr>
<tr>
<td>I wash cutting boards in the dishwasher</td>
<td>93</td>
<td>59.61</td>
<td>22</td>
<td>14.10</td>
<td>16</td>
<td>10.25</td>
<td>9</td>
</tr>
<tr>
<td>I thaw foods on the counter</td>
<td>2</td>
<td>1.27</td>
<td>1</td>
<td>0.63</td>
<td>8</td>
<td>5.09</td>
<td>32</td>
</tr>
<tr>
<td>I use the firmness test on meats to determine doneness of meats, poultry, and fish in place of a thermometer&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5</td>
<td>3.12</td>
<td>13</td>
<td>8.12</td>
<td>21</td>
<td>13.13</td>
<td>22</td>
</tr>
<tr>
<td>I use the same plate to take meat to the grill and return the cooked meat&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2</td>
<td>1.26</td>
<td>0</td>
<td>0.0</td>
<td>3</td>
<td>1.89</td>
<td>23</td>
</tr>
<tr>
<td>I usually let leftover foods rest on the counter until cooled to room temperature before placing in refrigerator&lt;sup&gt;b&lt;/sup&gt;</td>
<td>11</td>
<td>6.92</td>
<td>18</td>
<td>11.32</td>
<td>8</td>
<td>5.00</td>
<td>33</td>
</tr>
<tr>
<td>I use a thermometer to check final temperatures of foods cooked in the microwave</td>
<td>30</td>
<td>19.10</td>
<td>25</td>
<td>15.92</td>
<td>36</td>
<td>22.93</td>
<td>23</td>
</tr>
</tbody>
</table>

<sup>a</sup>Rating scale: SA = strongly agree, A = agree, A/D = neither agree nor disagree D = disagree SA = strongly disagree.<br>
<sup>b</sup>Negatively phrased items reverse coded.
State Agency

There are six state agency-level directors in the Mid-Atlantic region. Each received an invitation with a packet of information to participate in this study through the U.S. Postal Service in November, 2008. The packet consisted of a cover letter invitation to participate in an electronic or phone survey, sample questions about his or her state’s child nutrition program food safety regulatory requirements, and phone survey guidelines. Follow-up reminders were sent via electronic communication and fax. A total of 5 state agency level directors responded, for a response rate of 83%. Of the 5 state agency level directors responding to the survey, 4 (80%) of the directors were housed in their state’s Department of Education and one (20%) in the Department of Agriculture. Of these 5 state agency directors, 3 (60%) responded to the electronic survey and 2 (40%) responded by completing the questions and returning by fax. The fax respondents requested a phone survey and were contacted by the researcher. The phone call interview ranged between 10 and 12 minutes. The same open-ended questions presented on the electronic survey were asked in a similar sequence. Collectively, these state directors oversee programs in 8,128 public schools.

State agencies were asked to identify the current food code used in their states; different versions of the FDA Food Codes from 1999 to 2005 were reported as being used. HACCP food safety plans were not mandated in four of the five states prior to the Child Nutrition and WIC Reauthorization Act of 2004. However, HACCP-based principles were introduced with Food Code 1993, thus all states foodservices should have had familiarity with food safety plans. One state agency director reported all components related to a HACCP-based food safety plan had been required since 1980, but the term “HACCP” was not referenced until 2008. State agency directors were asked if additional regulations or
processes were required. Four of the 5 directors responded none beyond USDA guidance and 1 state reported detailed foodservice facility regulations were in place. However, it is not clear whether these detailed facility regulations indeed were more rigorous than the state’s adopted food code or the Reauthorization Act requirements of 2004.

State agency directors were asked whether districts were required to submit food safety plans for agency review. Of the 5 agencies, 4 did not require submission to the state agency. Of the 4 that did not require submission, 1 agency indicated the plan was submitted locally to the health department for review and approval. The only state requiring submission indicated that an abbreviated copy of the district’s food safety plan based on HACCP principles was kept in the state’s permanent file for the district. Interestingly, school FSDs in a survey by Story (2008) indicated a copy of the district’s food safety plan based on HACCP principles had been evaluated by their state agency, and that of these submitted plans, they received a 97.0% approved by the state agency. At the time of this study, evaluation criteria templates from USDA to state agencies did not exist. Based on the districts that required submission or review of the food safety plan, some states in the Mid-Atlantic region were proactive in requiring oversight by state agencies of districts’ HACCP plans.

State agency directors were also asked about the timing of the food safety plan reviews. Four state agencies indicated plans were reviewed during a CRE/SMI audit, during a commodity review, or as part of a technical assistance review. Of the 4 state agencies that outlined the process, 1 state agency indicated field staff checked to see if there was a food safety plan and whether foodservice staff were trained; a second state agency director indicated that field staff checked for SOPs and documented temperatures; a third state agency
director reported that the food safety plan in the state agency file was compared with observations of school district staff; and the fourth state agency director indicated the plan was examined, training recommended, and implementation needs identified. The fifth state agency director reported local health department inspectors reviewed plans annually as part of the comprehensive food safety inspection process and that the components reviewed included presence of SOPs, critical control points, monitoring, and corrective action plans; documentation of training; inclusion of steps to include menu processes in the plan; and procedures to revise the plan.

State agency directors were asked if they believed all districts were in compliance with the presence of a food safety plan at each site where food was prepared or served as required by the Child Nutrition and WIC Reauthorization Act of 2004. Only 3 state agency directors responded positively, indicating all districts were in compliance. Of the 4 states that conducted training about HACCP implementation, 3 state agency directors believed districts in their states had plans in place due to a provision of training and technical assistance, including creation of a model template with standards to help districts develop their own plans. Thornton (2007) reported that 93.8% of respondents in a regional study of FSDs indicated districts had developed and implemented food safety plan.

State agency directors in this study were asked what agency or department in their states had oversight responsibility for the sanitation inspections in school districts. The state’s Department of Agriculture ($n = 1$), local/county health departments under the Department of Agriculture ($n = 2$), and departments within the state overseeing health and human services or mental hygiene ($n = 2$) were identified. Sanitation inspections were reported as conducted by the Department of Agriculture ($n = 1$); local county, municipal or
city health departments \((n = 3)\); and the state department/division of public health \((n = 1)\). Story (2008) also found in her national study of school FSDs that the department most frequently reported as conducting sanitation inspections was the local health department (74.2%).

State agency directors reported that the frequency of health inspections ranged between one to two inspections \((n = 1)\), nearly two inspections \((n = 1)\), two inspections \((n = 2)\), or up to three inspections annually \((n = 1)\). In memo SP-24 from Stanley Garnett, Director of the Child Nutrition Division of the USDA (USDA-FNS, 2005b), state agency directors were required to collect and report to the FNS the number of schools that had zero, one, two, and more than two health inspections during the school year. USDA data based on state agency reporting indicated that during the 2005–2006 school year, only 58% of schools met or exceeded the recommended semiannual inspection, with an increase by 9% the following year to overall compliance of 67%. For the 2007-2008 school year, a 3% increase was reported, with 70% of districts in compliance with the Reauthorization Act requirement of two health inspections annually (USDA, 2009a.).

Only 4 state agency directors recounted how they received copies of inspections: via paper submission \((n = 1)\), electronic submission \((n = 1)\), or self-reports \((n = 2)\). All 5 state directors were asked about the posting of inspection results electronically. Each state responded that some results were posted electronically by one agency, 2 states noted they were either not sure or that inspection results were not posted electronically, and the remaining state agency reported inspection result postings varied throughout the state. State directors were asked whether a standard sanitation inspection form was used statewide; only
4 state directors responded, with half reporting a standardized form was used and the others not certain.
CHAPTER 5. SUMMARY AND CONCLUSIONS

In this study, school FSDs and SBOs in public school districts with enrollments between 2,500 and 25,000 in the Mid-Atlantic USDA geographic region provided responses to a paper-and-pencil survey. The FSDs’ assessed level of implementation of a mandated school food safety plan in their districts, perceived administrative support, and identification of the district’s food safety training efforts were compared with SBOs’ identified levels of support for the district’s child nutrition program. These variables, along with FSD and SBO demographic data and district characteristics, were analyzed to determine if significant differences existed in their perceptions. A summary of findings, study limitations, conclusion, and recommendations for future research are presented in this chapter.

Summary of Findings

Usable surveys were received from one third of the sample districts’ \((N = 498)\) FSDs \((n = 166)\) and a little less than 20% of the SBOs \((n = 91)\). All states in the Mid-Atlantic region were represented. The majority of FSDs indicated their title was director; close to two-thirds had completed a 4-year degree, and over half were between the ages of 46 to 66 years and had over 21 years of foodservice experience. Food safety certification for the FSD and/or kitchen manager was required in over half of the responding districts. However, less than 20% of districts required food safety certification for all kitchen staff. The majority of SBOs had earned a 4-year degree with over half of these holding graduate degrees. Over 80% of SBOs had 6 or more years of experience in school administration.

The FSDs and SBOs rated the existence and perceived level of importance of listed board-level policies related to food safety. The existence of a board-level district policy about food safety was noted by about one third of FSDs and one half of SBOs. However,
both groups rated highly the importance of such a policy with means over 4.0 on a 5.0 scale (FSDs, $M = 4.37$; SBOs, $M = 4.176$). Over half of both groups identified the existence of board-level policies in their districts regarding use of school meal production and service areas for non-child nutrition program use. The FSDs placed more importance on the need for policies to address foods from home than did SBOs, perhaps due to their greater awareness of how foods can become contaminated and recognition of the need to protect school children or members of the community from possible food-related illnesses. The perceived importance of volunteers receiving food safety training was higher for FSDs than for SBOs (FSDs, $M = 3.75$; SBOs, $M = 3.46$). In many districts, volunteers hold food-related fundraisers or operate concessions at sports, music, and other school events as a means to generate funds. Risks of foodborne occurrences may increase when nonfoodservice, noncertified food handlers are unaware of safe practices during preparation, service, and storage of food.

Additional formal SOPs need to be added to the district food safety plans to provide clear processes and communications for food safety assurances of local-source foods, school gardens, and farm-to-school foods. These reflect the Healthy, Hunger-Free Kids Act of 2010, which looks to now include these local sources in meals served in school.

Given the increased emphasis on the school health environment, it would seem logical that food safety training would be made available to protect the child and take added steps to serve safe food. FSDs and SBOs identified whether they thought nine listed items would positively influence district administrative support and funding for food safety training. The item identified most frequently by both FSDs and SBOs was state or federal agency mandate requiring such training. The second most frequently identified item by the
FSDs was corrective action during a CRE/SMI audit, whereas SBOs identified district board policy as the second most frequently identified influencer.

One question in this study was to determine FSDs’ assessed levels of implementation of the district’s HACCP-based food safety plan, as outlined by the USDA guidance document (USDA-FNS, 2005a). The FSDs’ responses were based on the presence of written SOPs addressing specific items, recordkeeping documentation, and other documentation used in their districts. Overall, 93.9% of FSDs reported their districts’ food safety plans as fairly complete ($M = 4.67$). Respondents indicated records were retained by schools; 40.9% of the FSDs indicated records were retained for 3 years. Documentation used in the responding districts differs from previous research. The majority of FSDs in this study indicated use of critical control points ($n = 134$), corrective actions ($n = 133$), and hazard analysis ($n = 126$) were documented, but less than one third ($n = 48$) of respondents documented the use of prerequisite programs. Prior observational research in Iowa schools found documentation of food safety practices and CCPs was lacking and that there was a need to develop written SOPs and strengthen prerequisite programs (Henroid & Sneed, 2004).

SBOs rated their level of familiarity with the Child Nutrition Reauthorization Act of 2004 which mandated district implementation of a food safety plan based on HACCP principles by fall of 2006. A mean rating of 2.70 on the 5-point scale with 5 = very familiar was calculated with close to half of the SBOs in the Mid-Atlantic region unfamiliar (34.1%) or not knowledgeable (12.5%) about the food safety component of the Reauthorization Act of 2004. SBOs also identified from a list of resources those that had been used to gain information about the new legislation and the elements they understood to be required in the district’s food safety plan. The majority of respondents reported learning of the requirements
of the legislation through the school FSD ($n = 55$); other frequently identified sources were state agency/agriculture departments ($n = 19$) or regional or local SBO meetings ($n = 13$).

Overall, FSDs in the Mid-Atlantic region perceived support from district administration for child nutrition programs, with mean ratings ranging from 4.23 to 2.91 on a 5-point Likert-type scale, with $5 = \text{very supportive}$. FSDs reported district administration was generally supportive of training ($M = 3.95$) but neutral on the importance of training for foodservice staff with minimal financial support provided for this effort. No significant differences were found among FSDs’ ratings and their age, gender, or years of foodservice experience.

Attitudes and knowledge of FSDs toward food safety practices were assessed, including items addressing personal practices used at home. The majority of FSDs did own a bimetallic stemmed thermometer and a refrigerator/freezer thermometer. Although use of the bimetallic stemmed thermometer for cooking at home was noted ($M = 4.23$), refrigerator/freezer thermometers were not checked with regularity ($M = 2.81$).

The FSDs’ attitudes toward food safety training and personal food safety practices when grocery shopping (GS scale), how they stored foods at home (HS scale), and cooking and preparing foods at home (HP scale) were assessed with a mean rating calculated for each scale. Analyses were conducted to determine whether significant differences existed by age, years of foodservice experience, or gender. Significant differences were found between FSDs in the age groups of 25 to 45 years and 46 to 66 years for home storage of foods (HS scale) as well as between those in the age groups of 25 to 45 years and 46 to 55 years for attitudes related to training. When total years of service were compared for those FSDs with 1–20 years of foodservice experience and those with 21 years or more of service, findings
indicated significance differences for the HS scale. Findings also were compared between males’ and females’ attitudes toward training, GS, HS, and HP with significant differences found between ratings by men and women on items on the HP scale.

Using district enrollments and their years in current position, SBOs’ attitudes and knowledge about child nutrition programs were compared to their familiarity with the food safety policy mandate. Findings of the analysis indicated there were no statistically significant differences when SBOs were compared by district enrollment or the number of years the SBOs had been in their current position. SBOs with the most familiarity with the food safety plan mandate had been in their current positions 6–10 years ($M = 3.07$).

The FSDs’ perceptions of support from SBOs toward child nutrition programs were analyzed based on the variables of age, gender, educational level, years in current position, total years of service, and SNA credential. Results indicated there were no statistically significant differences for any of these variables.

The FSDs’ perceptions of support from SBOs toward child nutrition programs based on district foodservice programs characteristics of student enrollment, type of production system, number of foodservice staff, and style of program management (self-operated or contracted foodservice) were compared. A mean perceived organizational support score was calculated and used as the dependent variable. There were no statistically significant differences found for the support mean score when compared by enrollment group; urban, suburban, or rural district designation; or production system. Statistically significant differences were found between mean perceived levels of support by FSDs of self-operated foodservice programs and contract management programs, with FSDs in contract managed
child nutrition programs identifying higher levels of administrative support for the foodservice program ($M = 4.23, SD = 0.546$ versus $M = 3.85, SD = 0.744$).

Differences in perceptions of FSDs and SBOs about the importance of district food safety policies were not statistically significant. Pairs of responses with the FSD and SBO from the same school district were matched and compared; no statistically significant differences between the paired data were found.

No relationships existed between districts’ level of support in release time, funding for continuing education and in-service programs, and FSDs’ assessed level of implementation of the HACCP-based food safety plan in their districts. A statistically significant but moderate relationship did exist between support in release time and actual number of days used for continuing education.

**Limitations of the Study**

Several limitations were identified for this study. With any study relying on self-reported data, the accuracy of the findings is dependent upon truthfulness in responses. FSDs were asked to provide data 2 years after the mandated policy went into effect on the level of completeness of the food-safety plan based on HACCP principles, recordkeeping documents and practices, and semiannual inspection results. Some directors reported they were new, others may not have recalled properly, and still others may not have read the question thoroughly or were not vested in the project. Both FSDs and SBOs skipped over survey questions or sections on the survey. The survey for the FSD was lengthy and some questions were not answered, although no concerns were identified in the pilot. There may have been some confusion in the first section regarding policy existence and policy importance, as some responses for importance were recorded as numeric and entered in the yes/no existence
column, thus the data were unusable. SBOs were asked to provide district staffing data by
classified and nonclassified groups on number of staff, FTEs, total number of training hours
by group, and minimums of district training hours. Much of these data were not provided.
The study sample is limited to one of the seven USDA FNS regions; findings may or may not
be generalizable to other regions.

A few factors impacting the response rate were use of personalized names and
addresses, local district policy on participating in external surveys, and method of survey
distribution and collection. A paper-and-pencil survey was selected for three key reasons: to
provide time for participants to gather data for the survey and to avoid problems of blocked
e-mail servers by district firewalls and inaccurate or unobtainable e-mail addresses. NCES
data were the foundation for listing of schools by state and enrollment; much of the contact
information for FSDs and SBOs was not current. Alternative sources, such state agency
sites, state association membership lists, district websites, and personal calls, were used to
locate street addresses, phone numbers, fax numbers and e-mail addresses of current staff.
The FSD was asked to deliver the prenotification postcard and survey packet to the SBO,
pick up the survey from the SBO, and return both sealed envelopes inside a larger prepaid
mailing envelope. Some surveys were returned by mail or fax by FSDs and SBOs
independently.

If planning such a paired design the following suggestions are made: Both the FSD
and SBO would receive a prenotification post card; the design would allow the FSD to self-
select either a paper-and-pencil survey or on-line survey. This would reduce the incorrect e-
mail addresses for the FSD. The SBO packet would still be mailed to the FSD for delivery;
and all SBO responses would be entered into the on-line survey, thus reducing data entry of
both surveys. In addition, 25% of the respondents would be asked to participate in a phase two follow up. Agreement to this phase would be included with the survey to the FSDs and would request the board-level policy on food safety and the recordkeeping documents.

**Conclusions**

Foodservice directors typically are considered middle managers within school district organizations. They serve as chief administrators of the district’s Child Nutrition Program. District goals related to the program are accomplished in part through effective communication between the director and district stakeholders using established structures and channels. Findings from this study suggest that FSDs need to continue to work toward keeping communication channels open. Resources are available from the professional organization, SNA, on how to communicate with various audiences within a district.

This study also indicated a need for greater adoption of district board-level policies to provide vision and structure on matters relating to safety of all foods prepared and/or served on school grounds. Policies reflect the mission of the district, health and well-being of the child, and communicating to district stakeholders the philosophy of the district while providing authority and guidance; findings from this study showed policies were perceived as needed and identified as important by both FSDs and SBOs, yet there was limited use of these. Involvement of both district and school-level teams to create a systemic approach to protecting the health of the school community is needed, as any food safety issues occurring within the district could result in the district being held accountable. Creating a policy related to food safety demonstrates board members’ commitment to promoting and safeguarding a healthy school environment. The direct and indirect costs incurred as a result
of a foodborne illness outbreak in a school could be prevented with the provision of regular training and establishment of policies and SOPs.

Findings from this study showed a need for districts to develop and adopt SOPs to guide procedures for food preparation, service, and sales district-wide. To assist districts in updating and refining their food safety plans through policy and SOP development, model food safety policy and SOP templates are readily available. Training for the FSD and school staff about changes in child nutrition program regulations and to provide opportunities to develop necessary skills to perform duties of the job are critical to the adoption of best practices and implementation of districts’ food safety plans. Food safety training should not be limited to foodservice staff but should be offered for anyone involved with food prepared, served, or sold in the district. This includes school board members, district administrators, management and hourly foodservice workers, noncertified and certified school staff, student groups, and volunteers. Planned and organized, regularly scheduled, and documented staff development provides for continuity within a district for new and returning staff members or those positions made available due to staff turnover.

Given current economic constraints experienced by many school districts and the new requirements of the Healthy Hunger Free Kids Act of 2010 (the Child Nutrition Reauthorization Act), foodservice budgets will be challenged. Investment by the district in their human resources will protect the health of children and others. District decision makers should ensure district-wide food safety policies, SOPs and training are provided.

**Recommendations for Future Research**

There continues to be a knowledge gap between administrative requirements of child nutrition programs and school district decision makers who allocate resources. Additional
studies should be conducted to assess the effectiveness of a child nutrition program and food safety educational component in school administrator licensing or certification programs. Currently, there are no requirements, yet many school food authorities are district administrators. Further studies should explore the educational preparation of the FSD and the impact on effectiveness of the child nutrition program, addressing financial, food safety, and nutritional adequacy of program. In many districts, the model or management practice of cook/supervisor is still used. To address the changing requirements for child nutrition programs, such as HACCP plan adoption, on-the-job experience, and production skills may not be sufficient preparation or ensure the skill sets needed to fulfill the responsibilities of this key position within the district. Such studies could be done among USDA regions and use quantitative and qualitative approaches to data collection.

The effectiveness of recent Child Nutrition Program Reauthorization regulations as well as funded and unfunded mandates also should be assessed. These include HACCP implementation, LWP changes, and training requirements as well as program changes impacting food costs (such as proposed portion changes in fruits and vegetables, addition of a meat/meat alternative to school breakfast meals, and encouragement of farm-to-school programs).
REFERENCES


Retrieved from http://www.fightbac.org/component/content/article/2/53-our-history


Washington, DC: Author.


APPENDIX A. INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

DATE: September 25, 2008
TO: Cynthia Dawso Van Druff
5 Autumn Ridge Drive, Glassboro, NJ 08028
CC: Catherine Strohbehn
31 MacKay Hall
FROM: Jan Canny, IRB Administrator
Office of Research Assurances
TITLE: An Exploratory Study of School Districts' Food Safety Plan
Implementation and Support for Food Safety and Training in Child
Nutrition Programs
IRB ID: 08-319 Study Review Date: 19 September 2008

The Institutional Review Board (IRB) Chair has reviewed this project and has declared the study exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b). The IRB determination of exemption means that:

- You do not need to submit an application for annual continuing review.

- You must carry out the research as proposed in the IRB application, including obtaining and documenting (signed) informed consent if you have stated in your application that you will do so or if required by the IRB.

- Any modification of this research should be submitted to the IRB on a Continuing Review and/or Modification form, prior to making any changes, to determine if the project still meets the Federal criteria for exemption. If it is determined that exemption is no longer warranted, then an IRB proposal will need to be submitted and approved before proceeding with data collection.

Please be sure to use the documents with the IRB approval stamp in your research.

Please note that you must submit all research involving human participants for review by the IRB. Only the IRB may make the determination of exemption, even if you conduct a study in the future that is exactly like this study.
November, 2008

Dear Colleague,

Thank you for your assistance.

This packet of material contains the survey and an evaluation form for you to complete. Earlier this week, you agreed to review my survey for school foodservice directors for content validity. The survey data will be part of the research project for completion of my doctoral degree from Iowa State University. The research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of district support for food safety training and implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004. Other areas that will be measured are food safety beliefs, attitudes toward staff training, personal and district characteristics.

School Foodservice Directors and School Business Administrators from the same K-12 public school districts with enrollments between 2,500 and 25,000 located in the Mid-Atlantic geographic USDA region states in the continental United States and state agencies directors are being sent surveys. It is imperative that we receive a response since my census study \( n = 498 \) and I need the findings to accurately reflect this population.

Please review the survey for relevant content and complete the attached evaluation form and return to me via e-mail within two weeks of the postmark on the outer envelope. If for some reason, you cannot complete the content evaluation, please send me a note to my e-mail and add “Content Eval-FSD” in the text box. My contact information is on the evaluation form.

Thank you so much for your assistance.

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Phone: 215-830-1522

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APPENDIX C. FOODSERVICE DIRECTOR CONTENT VALIDITY EVALUATION FORM

Directions: After you review the Content Validity Evaluation, please respond to questions below. Feel free to add any additional comments about specific questions on the survey itself. Thank you for your feedback.

1. Where all the relevant questions asked?

2. Were there any questions that were missing? If so, please note.

3. Was there duplication in content that should be eliminated?

4. Are there any other comments you would like to make about the survey?

Please return by e-mail to cindy720@iastate.edu

Thank you so much for your input and suggestions.

If you have any questions about the evaluation form or survey, please feel free to contact me at 215-830-1522.
October, 2008

Dear School Business Manager Graduate Student,

This packet of material contains the survey and an evaluation form for you to complete. Earlier this week, I received permission for you to review my survey for school business officials for content validity. The survey data will be part of the research project for completion of my doctoral degree from Iowa State University. The research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004. Other areas that will be measured are attitudes toward staff food safety training, personal, and school district characteristics.

School Foodservice Directors and School Business Administrators from the same K-12 public school districts with enrollments between 2,500 and 25,000 located in the Mid-Atlantic geographic USDA region states in the continental United States and state agency directors are included in this study. My census study (n = 498) and it is imperative that we receive a response from all schools to ensure the findings accurately reflect this population.

Please review the survey for relevant content and complete the attached evaluation form and return to me via e-mail on or within seven business days if the date if the postmark on the outer envelope. If for some reason you are unable to complete the content evaluation, please send me an e-mail at cindy720@iastate.edu and place “Content Eval-SBO” in the text box. My contact information is on the evaluation form.

Thank you so much for your assistance.

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Phone: 215-830-1522

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Phone-515-294-3527
APPENDIX E. SCHOOL BUSINESS OFFICIAL CONTENT VALIDITY EVALUATION FORM

Directions: After you review the Content Validity Evaluation, please respond to questions below. Feel free to add any additional comments about specific questions on the survey itself. Thank you for your feedback.

1. Were all the relevant questions asked?

2. Were there any questions that were missing? If so, please note.

3. Was there any duplication in content that should be eliminated?

4. Are there any other comments you would like to make about the survey?

Please return by e-mail to cindy720@iastate.edu

Thank you for your input and suggestions.

If you have any questions about the evaluation form or survey, please feel free to contact me at 215-830-1522.
APPENDIX F. FOODSERVICE DIRECTOR PILOT LETTER

October, 2008

Dear Colleague,

This packet of material contains the pilot survey. Thank you for agreeing to pilot test my survey. The survey data will be part of the research project for completion of my doctoral degree from Iowa State University. The research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of district support for food safety training and implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004. Other areas that will be measured are food safety beliefs, attitudes toward staff training, personal and district characteristics.

School Foodservice Directors and School Business Administrators from the same K-12 public school districts with enrollments between 2,500 and 25,000 located in the Mid-Atlantic geographic USDA region states in the continental United States and State Agency Directors are included in the study. It is imperative that we receive a response from those selected to participate to ensure the findings accurately reflect this population; therefore your input to the survey is very critical.

This assessment is a one-time only pilot test survey. It will be easier to complete the survey if you have ready access to the following data for the year ending May, 2008:

- Total district enrollment
- Combined percent of children approved for free and reduced meals
- Total foodservice department expenditure budget for the 2007-2008 school year
- Total number of FTE’s in the foodservice department (including secretary support, warehouse staff, and truck drivers)
- Information on number of staff with food safety certifications, hours of training for SNA certification, National Restaurant Association, and/or local health department
- District foodservice sites’ 2007-2008 inspection reports from local health department

There is limited research about the extent and effects of the HACCP implementation mandate. Your review and comments of this survey will help all Child Nutrition Program directors to understand how polices are accepted and implemented in school districts, and what factors are believed to influence school administration support for the district’s foodservice program.
Special Instructions:
There are two surveys in your packet with evaluation sheets. The survey marked FSD, is your pilot test survey. The survey in the unsealed inner envelope marked SBO is for your School Business Administrator to pilot test. Please give the survey packet marked SBO to your School Business Administrator. They are asked to review and evaluate the entire survey. They will include the evaluation form and survey, seal it, and return to you within 10 days of receiving the packet. Place both into the self-addressed envelope, seal it, and return to me by within two weeks of the postmark on the outer envelope. Please complete your test pilot survey and survey evaluation form and return to the address on the envelope along with the SBO’s packet with evaluation form.

Your participation in this research is, of course, voluntary. Your confidentiality and anonymity are assured. Return of the surveys is implied consent for responses to be compiled with others. Although the survey is coded to allow for follow-up with non-respondents, you will not be individually identified with your questionnaire or responses. Please understand that use of this data will be limited to this research, as authorized by the Iowa State University, (located in Ames, Iowa). Results may ultimately be presented in formats other than the dissertation, such as journal articles, or conference presentations, but the data will be summarized. You also have the right to express concerns to me at the number below, to my major professor Dr. Catherine Strohbehn, and/or the ISU Institutional Review Board.

We greatly appreciate your participation in this research. Please collect the SBOs pilot test and evaluation form in a sealed envelope and place your pilot test survey and evaluation and return to me in the enclosed, self-addressed, stamped envelope within two weeks of the postmark on the outer envelope. If for any reason you are unable to complete the pilot test, please contact me by e-mail cindy720@iastate.edu and place “Pilot survey-FSD” in the text box.

We genuinely appreciate your time.

PhD Candidate, Iowa State University
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Iowa State University
Ames, Iowa
Email: cstrohbe@iastate.edu
Phone: 515-294-3527
APPENDIX G. FOODSERVICE DIRECTOR PILOT EVALUATION FORM

Directions: After you complete the Pilot Survey, please respond to questions below. Feel free to add any additional comments about specific questions on the survey itself. Thank you for your feedback. Please collect the SBOs packet and return with your packet to:

Please return in self-addressed stamped envelope to:
Cynthia Dawso Van Druff, 5 Autumn Ridge Drive, Glassboro, NJ 08028
215-830-1522 (work) 856-582-0741 (home) cindy720@iastate.edu

1. How long did it take you to complete the survey?
   ◊ Less than 10 minutes
   ◊ 10-20 minutes
   ◊ 20-30 minutes
   ◊ 30-35 minutes
   ◊ more than 35 minutes

2. Did you have any difficulty understanding the instructions?
   ◊ Yes ◊ No
   If yes, which sections of instruction were difficult to understand?

3. Did you have any difficulty understanding the questions?
   ◊ Yes ◊ No
   If yes, which questions were difficult to understand?

4. Are there any questions you would eliminate?
   ◊ Yes ◊ No
   If yes, which ones?

5. Are there any questions you would change or simplify?
   ◊ Yes ◊ No
   If yes, which ones?
   Please comment directly on the survey.

6. Do you think the school foodservice directors will complete this survey if they receive the survey in the mail?
   ◊ Yes ◊ No
   If no, why not?

7. Are there any other comments you would like to make about the survey?
   ◊ Yes ◊ No
APPENDIX H. SCHOOL BUSINESS OFFICIAL PILOT LETTER

October, 2008

Dear School Business Administrator,

This packet of material contains the pilot survey. Thank you for agreeing to pilot test my survey. The survey data will be part of the research project for completion of my doctoral degree from Iowa State University. The research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004. Other areas that will be measured are attitudes toward staff food safety training, personal, and school district characteristics.

School Foodservice Directors and School Business Administrators from the same K-12 public school district with enrollments between 2,500 and 25,000 located in the Mid-Atlantic geographic USDA region states in the continental United States that comprise the Mid-Atlantic geographic USDA region and State Agency Directors are part of this study. It is imperative that we receive a response from those selected to participate to ensure the findings accurately reflect this population; therefore your input and assessment is vital.

We ask that you complete this one time only pilot test survey. It will be easier to complete the survey if you have ready access to the following data for the year ending, May, 2008.

- Total school district expenditure budget for the 2007-2008 school year
- School district expenditure budget for training of staff for the 2007-2008 school year
- Number of FTE’s in the district for each of following categories of employees: teachers, administrators, and non-instructional/support staff

There is limited research about the extent and effects of the HACCP implementation mandate. Your comments and suggestions to this survey will greatly enhance our understanding of how polices are accepted and implemented in school districts, and what factors are believed to influence school administrators views about districts’ foodservice programs.
Special Instructions:
You will receive an envelope marked “SBO” and a paper survey and test pilot evaluation form. Please complete the survey and test pilot evaluation form, place it in the envelope marked “SBO” and return to your school foodservice director within 10 days of receiving the packet. Then the school foodservice director will combine your survey and evaluation form with the completed FSD survey and place both into the self-addressed envelope, seal it, and return to me.

Your participation in this research is, of course, voluntary. Your confidentiality and anonymity are assured. Return of the survey to me is your implied consent for your responses to be compiled with others. Although the survey is coded to allow for follow-up with non-respondents, you will not be individually identified with your questionnaire or responses. Please understand that use if this data will be limited to this research, as authorized by Iowa State University (located in Ames, Iowa). Results may ultimately be presented in formats other than the dissertation such as journal articles, or conference presentations, but the data will be summarized. You also have the right to express concerns to me at the number below, my major professor Dr. Catherine Strohbehn, and/or the ISU Institutional Review Board.

We greatly appreciate your participation in this research. Please place the completed pilot test survey and evaluation form in the enclosed, sealing envelope and return to your school foodservice director. If for any reason you are unable to complete the pilot test, please contact me by e-mail cindy720@iastate.edu and place “Pilot survey-SBO” in the text box.

We genuinely appreciate your time.

PhD Candidate, Iowa State University
Director of Food Services
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Phone: 215-830-1522

Adjunct Associate Professor/HRIM
Extension Specialist
Iowa State University
Ames, Iowa
Email: cstrohbe@iastate.edu
Phone:515-294-3527
APPENDIX I. SCHOOL BUSINESS OFFICIAL PILOT EVALUATION FORM

Directions: After you complete the Pilot Survey, please respond to questions below. Feel free to add any additional comments about specific questions on the survey itself. Thank you for your feedback. Please collect the SBOs packet and return with your packet to:

Please return in self-addressed stamped envelope to:
Cynthia Dawso Van Druff, 5 Autumn Ridge Drive, Glassboro, NJ 08028
215-830-1522 (work) 856-582-0741 (home) cindy720@iastate.edu

1. How long did it take you to complete the survey?
◊ Less than 10 minutes
◊ 10-20 minutes
◊ 20-30 minutes
◊ 30-325 minutes
◊ more than 35 minutes

2. Did you have any difficulty understanding the instructions?
◊ Yes ◊ No
If yes, which sections of instruction were difficult to understand ____________?

3. Did you have any difficulty understanding the questions?
◊ Yes ◊ No
If yes, which questions were difficult to understand ________________________?

4. Are there any questions you would eliminate?
◊ Yes ◊ No
If yes, which ones __________________________________________________________

5. Are there any questions you would change or simplify?
◊ Yes ◊ No
If yes, which ones __________________________________________________________
Please comment directly on the survey.

6. Do you think the school business official will complete this survey if they receive the survey in the mail?
◊ Yes ◊ No
If no, why not?
________________________________________________________________________

7. Are there any other comments you would like to make about the survey?
◊ Yes ◊ No
________________________________________________________________________
APPENDIX J. FOODSERVICE DIRECTOR PRENOTIFICATION POSTCARD

November, 2008

Dear School Foodservice Director,

In about five days you and other school foodservice directors and school business administrators in the Mid-Atlantic USDA Region will receive a short survey by mail. The purpose of the survey is to assess the level of district support for food safety training and implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004.

This pre-survey notification is being sent to encourage your participation. The beginning of the school year is very busy and we want to be sure you can plan your time to complete the survey. We need input from those in charge of Child Nutrition Programs that fully understand the implications of the HACCP mandate.

Please watch your mail. The survey packet will contain complete instructions for you and your school business administrator along with a self-addressed return envelope.

If you have any questions please send me an e-mail with “FOOD SAFETY SURVEY-FSD” in the text box to cindy720@iastate.edu.

Thank you,

PhD Candidate, Iowa State University
Director of Food Services
Upper Moreland School District
Willow Grove, PA
E-mail:cindy720@iastate.edu
Phone: 215-830-1522

Adjunct Associate Professor/HRIM
Extension Specialist
Iowa State University
Ames, Iowa
Email: cstrohbe@iastate.edu
Phone: 515-294-3527
November, 2008

Dear School Business Administrator,

In about five days you and other school business administrators and school foodservice directors in the Mid-Atlantic USDA Region will receive a short survey by mail. The purpose of the survey is to assess the level of district support for food safety training and implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004.

This pre-survey notification is being sent to encourage your participation. The beginning of the school year is a very busy time and we want to be sure you can plan your time to complete the survey. We need input from School Business Administrators that fully understand their impact on Child Nutrition Programs and policy mandates.

Please watch your mail. The survey packet will be mailed via your school foodservice director and will contain complete instructions for you and your school foodservice director. Your school foodservice director will deliver and collect your survey.

If you have any questions please send me an e-mail with “FOOD SAFETY SURVEY-SBO” noted in the text box to cindy720@iastate.edu.

Thank you,

PhD Candidate, Iowa State University
Director of Food Services
Upper Moreland School District
Willow Grove, PA
E-mail:cindy720@iastate.edu
Phone: 215-830-1522

Adjunct Associate Professor/HRIM
Extension Specialist
Iowa State University
Ames, Iowa
Email:cstrohbe@iastate.edu
Phone:515-294-3527
APPENDIX L. FOODSERVICE DIRECTOR CONTACT LETTER

November, 2008

Dear Colleague,

This packet of material contains the survey you were notified about earlier this week. The survey data will be part of the research project for completion of my doctoral degree from Iowa State University. The research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of district support for food safety training and implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004. Other areas that will be measured are food safety beliefs, attitudes toward staff training, personal and district characteristics.

School Foodservice Directors and School Business Administrators from the same K-12 public school districts with enrollments between 2,500 and 25,000 located in the Mid-Atlantic geographic USDA region states in the continental United States are being sent surveys. It is imperative that we receive a response from those selected to participate to ensure the findings accurately reflect this population.

We ask that you take the 20 minutes or so that will be needed to complete this one-time only survey. It will be easier to complete the survey if you have ready access to the following data for the year ending May, 2008:

- Total district enrollment
- Combined percent of children approved for free and reduced meals
- Total foodservice department expenditure budget for the 2007-2008 school year
- Total number of FTE’s in the foodservice department (including secretary support, warehouse staff, and truck drivers)
- Information on number of staff with food safety certifications, hours of training for SNA certification, National Restaurant Association, and/or local health department
- District foodservice sites’ 2007-2008 inspection reports from local health department

There is limited research about the extent and effects of the HACCP implementation mandate. Your response to this survey will greatly enhance our understanding of how polices are accepted and implemented in school districts, and what factors are believed to influence school administration support for the district’s foodservice program.
Special Instructions:
There are two surveys in your packet. The survey marked FSD, is your survey. The survey in the unsealed inner envelope marked SBO is for your School Business Administrator. Please give the survey packet marked SBO to your School Business Administrator. They are asked to complete the survey, seal it, and return to you within 10 days of receiving the packet. Place both into the self-addressed envelope, seal it, and return to me.

Your participation in this research is, of course, voluntary. Your confidentiality and anonymity are assured. Return of the surveys is implied consent for responses to be compiled with others. Although the survey is coded to allow for follow-up with non-respondents, you will not be individually identified with your questionnaire or responses. Please understand that use of this data will be limited to this research, as authorized by the Iowa State University, (located in Ames, Iowa). Results may ultimately be presented in formats other than the dissertation, such as journal articles, or conference presentations, but the data will be summarized. You also have the right to express concerns to me at the number below, to my major professor Dr. Catherine Strohbehn, and/or the ISU Institutional Review Board.

We greatly appreciate your participation in this research. Please return the survey within two weeks of the posted date on the out envelope in the enclosed, self-addressed, stamped envelope. This will save a follow-up mailing to you.

Thank you for your interest and participation in this study. We genuinely appreciate your time.

PhD Candidate, Iowa State University
Director of Food Services
Upper Moreland School District
Willow Grove, PA
E-mail: cindy720@iastate.edu
Phone: 215-830-1522

Adjunct Associate Professor/HRIM
Extension Specialist
Iowa State University
Ames, Iowa
Email: cstrohbe@iastate.edu
Phone: 515-294-3527
APPENDIX M. FOODSERVICE DIRECTOR SURVEY

PART A School District Policies

Instructions: Please respond to the following questions about district board-level policies related to food safety and your rating of importance of such policies (whether they currently exist or not in your district). Select a “Yes” or “No” to indicate if the district board level-policy currently exists and rate the level of importance using a 5-point rating scale where 5 = Very Important and 1 = Very Unimportant.

5 Very Important 4 Somewhat Important 3 Neither Important/Unimportant 2 Somewhat Important 1 Very Unimportant

<table>
<thead>
<tr>
<th>Policy</th>
<th>Importance of Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy Exists</td>
<td>YES  NO  5  4  3  2  1</td>
</tr>
</tbody>
</table>

A-1. How important is it to have a district board-level policy about food safety?

A-2. How important is it to have a district board-level policy about kitchen and facility use for purposes other than the Child Nutrition Program?

A-3. How important is it to have a district board-level policy concerning foods prepared at home for resale at school/district sponsored events? (For example, bake sale or hoagie fund raiser)

A-4. How important is it to have a district board-level policy for foods prepared at home for use in classroom parties, celebrations, and treats?

A-5. How important is it to have a district board-level policy for foods prepared at home for use in covered dish dinners?

A-6. How important is it to have a district board-level policy requiring ALL district staff to be trained in food safety and sanitation? (Including Administrators, principals, secretaries, teachers, school foodservice staff, bus drivers, and custodians).

A-7. How important is it to have a district board-level policy requiring ALL school foodservice staff to be trained in food safety and sanitation?

A-8. How important is it to have a district board-level policy for volunteers requiring training in food safety and sanitation? (For example, all or those who work with any type of food preparation or service?)

A-9. Do you think that district board-level polices supporting safe food practices can help reduce foodborne incidences?

- Yes
- No
- Not sure
- Don’t know

A-10. Please identify which factors you think would most likely positively influence district administration support and result in district funds for food safety training? (Select all that apply).

- Mandated by state or federal agencies
- District board-level policy
- Required component of the Coordinated Review Effort/School Meals Initiative (CRE/SMI) review
- Corrective action noted during the CRE/SMI review
- Knowledgesble foodservice director
- Public relations and media attention to food safety
- Foodborne illness outbreak in a district school
- Parental demands
- Food product recall
Part B
Completeness and Use of District’s Food Safety Plan

Following is a list of the HACCP-based SOPs included in the USDA Guidance for School Food Authorities: Developing a School Food Safety Program Based on the Process Approach to HACCP Principles (2005). Eight written components have been identified as needed for development and implementation of an SOP document: defined purpose, scope, instructions, monitoring process, corrective actions, verification, recordkeeping, dates of implementation review, and revisions. DIRECTIONS: Please answer each of the following questions about your district’s foodservice program level of completeness in writing and implementing SOPs using this 5-point scale where 5 = Complete and 1 = No SOP.

Please use the following scale:

5. Complete (SOP contains the eight identified components, is written and implemented)
4. Fairly complete (SOP contains at least five of identified components, is written but not fully implemented or practiced)
3. Somewhat complete (SOP contains at least four of identified components and is in written form)
2. Fairly incomplete (SOP is written and contains at least two of eight identified components)
1. Not started – Nothing has been put in writing

<table>
<thead>
<tr>
<th>B-1. Level of completeness-SOPs</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooking Potentially Hazardous Foods</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Cooling Potentially Hazardous Foods</td>
<td></td>
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<td></td>
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<tr>
<td>Holding Hot and Cold Potentially Hazardous Foods</td>
<td></td>
<td></td>
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<tr>
<td>Date Marking Ready-to-Eat, Potentially Hazardous Foods</td>
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<td></td>
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<tr>
<td>Personal Hygiene</td>
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<tr>
<td>Reheating Potentially Hazardous Foods</td>
<td></td>
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<td></td>
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<tr>
<td>Receiving Deliveries</td>
<td></td>
<td></td>
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<tr>
<td>Storing and Using Poisonous or Toxic Chemicals</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Using Suitable Utensils When Handling Ready-to-Eat Foods</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Washing Fruits and Vegetables</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Washing Hands</td>
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<tr>
<td>Other:</td>
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</tbody>
</table>

DIRECTIONS: Please answer the following questions in regards to recordkeeping and documentation for your district’s food safety program (i.e., monitoring forms for refrigerated storage temperatures, etc.).

B-2. Are written records for your district’s food safety program kept by each school building?
   ○ Yes  ○ No

B-3. How long does the district retain food safety records? __________________________

<table>
<thead>
<tr>
<th>B-4. Please indicate all of the recordkeeping documents used by your district.</th>
<th>Yes</th>
<th>No</th>
<th>Do Not Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving Log</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooking and Reheating Temperature Log</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooling Temperature Log</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damaged or Discarded Product Log</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigeration Log</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other forms:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part C  
Foodservice Staff in your District  
DIRECTIONS: Please answer the following questions in regards to foodservice staff in your district, responding with a yes or no for each statement.

<table>
<thead>
<tr>
<th>C-1</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are food safety concepts discussed during the interview process?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are food safety concepts a component of the orientation process?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are food safety practices included in task lists for staff?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are food safety practices defined in the job descriptions?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are food safety practices integrated into the performance appraisal instrument (evaluation)?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part D  
Sanitation Inspections in your District  
DIRECTIONS: Please answer the following questions in regards to the 2007-2008 school year.

<table>
<thead>
<tr>
<th>D-1</th>
<th>Each of the food preparation and service sites in my district receives two written inspection reports each year by the local health inspector for foodservice establishments:</th>
<th>D-2a</th>
<th>My district is charged a fee for the inspection of the foodservice establishments by the regulatory agency:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ Yes  ○ No</td>
<td>○ Yes  ○ No</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If no, skip to D-3</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D-2b</th>
<th>If yes, to the above question (D-2a), what was the total amount in fees paid for the entire district during the 2007-2008 school year?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D-3</th>
<th>Where do you post inspection reports? Please list all locations (i.e. in the cafeteria):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D-4</th>
<th>To your knowledge, how many times did a community member (parent, school board, administrative team member, and/or media) request a copy of an inspection report for any district foodservice establishment during the 2007-2008 school year?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○ Never</td>
</tr>
<tr>
<td></td>
<td>○ 1 time</td>
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<tr>
<td></td>
<td>○ 2-5 times</td>
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<tr>
<td></td>
<td>○ 6-10 times</td>
</tr>
<tr>
<td></td>
<td>○ 10 or greater</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D-5</th>
<th>Please review inspection reports received during the 2007-2008 school year for all buildings in district and complete the following questions about your district.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>How many foodservice sites in your district receive inspections?</td>
</tr>
<tr>
<td></td>
<td>Did any foodservice sites have critical violations?</td>
</tr>
<tr>
<td></td>
<td>Please list any critical violations:</td>
</tr>
<tr>
<td></td>
<td>Please list all the corrective actions:</td>
</tr>
</tbody>
</table>
**Part E**

District Support for Food Safety

**DIRECTIONS:** Indicate your perceived level of organizational support from district administration for these areas related to the foodservice operation. Use this 5-point scale with 5 = Very Supportive and 1 = Very Unsupportive.

- 5: Very supportive
- 4: Generally supportive
- 3: Neither Supportive nor Unsupportive
- 2: Unsupportive
- 1: Very Unsupportive

<table>
<thead>
<tr>
<th>E-1. My district administrators are Very Supportive – Very Unsupportive about:</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative balance monthly financial reports</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Increases to annual foodservice budget</td>
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<tr>
<td>Meal price increases</td>
<td></td>
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<tr>
<td>Student charging of meals</td>
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<tr>
<td>Personnel issues</td>
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<tr>
<td>Staffing needs</td>
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<tr>
<td>Policy implementation</td>
<td></td>
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<tr>
<td>Facilities use by outside groups</td>
<td></td>
<td></td>
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<tr>
<td>Maintaining kitchen and facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital purchases—greater than $ 500.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative net operating income</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Community response to program changes</td>
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<tr>
<td>Crisis management</td>
<td></td>
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<td></td>
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<tr>
<td>Other expenses—trash, recycling fees, utilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training opportunities for school foodservice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial support for foodservice fund</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Implementing mandated laws</td>
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</tbody>
</table>

**Part F**

Attitudes toward food safety training

**DIRECTIONS:** Indicate your level of agreement with these statements related to food safety training, using a 5-point scale where 5 = Strongly Agree and 1 = Strongly Disagree.

- 5: Strongly agree
- 4: Agree
- 3: Neither Agree nor Disagree
- 2: Disagree
- 1: Strongly disagree

<table>
<thead>
<tr>
<th>F-1. Attitudes toward food safety training</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel food safety training is important</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Food safety training is not needed for my staff</td>
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<tr>
<td>Food safety training helps my staff develop professionally</td>
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<tr>
<td>I do not feel a responsibility to provide food safety training to my staff</td>
<td></td>
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</tr>
<tr>
<td>Knowing proper procedures is an important part of food safety training</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Providing opportunities for staff to practice a new skill is not necessary</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>The safety of food served to children in my district can be ensured by a trained staff</td>
<td></td>
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</tr>
</tbody>
</table>
DIRECTIONS: Please respond “Yes or NO” to the following statements related to food safety training your staff received prior to June 2008 about HACCP.

F-2. Training was conducted in the area of food safety as it related to the district’s food safety plan based on HACCP principles.
- Yes
- No
- Do not know

<table>
<thead>
<tr>
<th>F-3. Food safety training was provided:</th>
<th>Yes</th>
<th>No</th>
<th>Do Not Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>During the school year</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Only during school in-service day</td>
<td></td>
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<tr>
<td>Away from the district</td>
<td></td>
<td></td>
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<tr>
<td>During the summer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food safety training was not provided</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>F-4. Following content areas were components of the training.</th>
<th>Yes</th>
<th>No</th>
<th>Do Not Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergens</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bare-hand contact of ready-to-eat foods</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Thermometer calibration</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Chemical storage</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cooling techniques</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Corrective actions</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Critical limits</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Critical control points</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Food recall procedures</td>
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<td></td>
<td></td>
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<tr>
<td>Handwashing</td>
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<td></td>
<td></td>
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<tr>
<td>Hot and cold food holding</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Personal health and hygiene</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Monitoring procedures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recordkeeping</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recipe processes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reheating of leftovers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanitizing solutions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standardized recipes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-inspection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage procedures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of food thermometer to test food</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Part G
Personal Food Safety Practices

DIRECTIONS: Please answer the following questions about your personal food safety practices.

G-1. Where do you keep your chlorine bleach at home? ____________

G-2. Check all of the types of thermometers you use at home:

<table>
<thead>
<tr>
<th>Thermometers</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bimetallic-stemmed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oven</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refrigerator/Freezer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

G-3. Check all of the types of cutting boards you use at home:

<table>
<thead>
<tr>
<th>Cutting Boards</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wooden</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disposable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyethylene/synthetic (plastic)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


DIRECTIONS: Please use this 5-point scale (5 = Strongly Agree to 1 = Strongly Disagree) to indicate your degree of agreement with each of the statements related to food safety practices away from the child nutrition program.

5 - Strongly Agree
4 - Agree
3 - Neither Agree nor Disagree
2 - Disagree
1 - Strongly Disagree

<table>
<thead>
<tr>
<th>G-4. When grocery shopping...</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>The grocery store is my first stop when running errands.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I check expiration dates of foods in the store, but leave out-of-date items on the grocery shelf.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I purchase out-of-date items for immediate use.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do not place refrigerated items such as meat, poultry, and dairy foods, in the cart first.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I keep packages of raw meat and poultry separate from bags of fresh fruits and vegetables.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I shop for frozen foods at beginning of my shopping trip.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do not keep packages of cleaning agents separate from food products.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>During warm weather, I do not bring a cooler filled with ice to keep purchased frozen/refrigerated foods at a proper temperature because my drive home is greater than 15 minutes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I report out-of-date items to the customer service center of the store.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G-5 For storage of food items at home...</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have a thermometer inside the refrigerator.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I store leftovers uncovered in the refrigerator.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I check the refrigerator thermometer temperature daily.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I store raw meat/poultry together in refrigerator drawers with fresh fruits and vegetables.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I keep chemicals in the original containers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When I return home from shopping, non-refrigerated foods, such as canned goods, are put away first.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>G-6 When preparing and cooking food at home</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>I wash my hands before starting food preparation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I thaw foods partly in the microwave and thaw the rest of the way in the refrigerator.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use different cutting boards for raw meats and fresh produce.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I just brush off the cutting board before putting away.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I wash cutting boards in hot soapy water and rinse between uses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I only rinse knives between uses.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I wash cutting boards in a dishwasher.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I thaw foods on the counter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use the firmness test on meats to determine doneness of meat, poultry, and fish in place of a thermometer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use the same plate to take meat to the grill and return the cooked meat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I usually let leftover foods rest on the counter until cooled to room temperature before placing in refrigerator.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I use a thermometer to check final temperatures of foods cooked in microwave.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Part H
Demographic Information

DIRECTIONS: Please answer the following questions about you and your school district.

H -1. What was your district's certified student enrollment for Grades Pre-K – 12 during the school year (2007-2008)?

H -2. My district is considered:
   ○ Urban
   ○ Suburban
   ○ Rural

H -3. What was the expenditure budget for the school foodservice program in your district 2007-2008 school year (food/labor/benefit costs/equipment/depreciation, etc.)?
   ○ Less than $ 1,000,000
   ○ $ 1,000,000 - $1,999,999
   ○ $ 2,000,000 - $ 2,999,999
   ○ $ 3,000,000 - $ 3,999,999
   ○ $ 4,000,000 - $ 4,999,999
   ○ $ 5,000,000 or > please list below

H -4. Is your school district’s foodservice program under outside contract?
   ○ Yes  ○ No
   If so, to whom?

H -5. What federal programs did your district participate in during the 2007-2008 school year?

<table>
<thead>
<tr>
<th>Federal programs</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Breakfast Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>National School Lunch Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After School Snack Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fresh Fruit and Vegetable program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Milk Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer Food Service Program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other – Please list</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

H -6. What other programs were operated by the school foodservice department in your district during the 2007-2008 school year?

<table>
<thead>
<tr>
<th>Other programs</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catering</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vending</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concessions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School store</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day Care/Head Start</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other – Please list</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Production and Serving Methods

H -7. Which of the following production methods are used in your school district’s foodservice program? (Check all that apply).
   ○ Conventional (Full production kitchen where food is prepared on site and served on school site)
   ○ Commissary (Facility where food is prepared for off-site and distributed to school)
   ○ Base kitchen (Food items cooked on site for school site and for shipping to satellite kitchen)
   ○ Satellite kitchens (Buildings receive prepared foods in bulk or portions)

H -8. Which of the following serving systems are used in your school district's foodservice program? (Check all that apply).
   ○ Food court
   ○ Kiosk
   ○ Grab and Go
   ○ Self-serve
   ○ Offer versus Serve
   ○ Traditional serving to child (foodservice staff serves food)
   ○ Breakfast in the classroom
   ○ Breakfast in a bag
   ○ Breakfast on the school bus

H -9. What was the reported percent of students in your district receiving free and reduced priced meals for the 2007-2008 school year? _______ %
**H -10.** What is your official title?
- Foodservice Director/ Child Nutrition Director
- Foodservice Supervisor
- Area Manager
- Coordinator
- Specialist
- Administrative Assistant-Operations
- School Kitchen Manager
- Cook/Manager
- School Business Official (Director of Finance, Business Manager, Asst. Superintendent)
- Other, please specify

**H -11.** Identify the highest level of education you have completed:
- High school diploma
- Some college
- Associate degree (2 year)
- Bachelors degree
- Some graduate work
- Graduate degree
- Doctoral degree

**H -12.** What is your School Nutrition Association (SNA) membership type?
- Director
- Manager
- Educator
- I am not a member

**H -13.** Are you credentialed as a School Nutrition Specialist (SNS) from the SNA?
- Yes
- No

**H -14.** Please check all credentials and certifications that you hold.
- Diet Tech or DTR
- Registered Dietitian
- Certified Dietary Manager
- ServSafe® Certified
- State/County agency food handler’s certificate
- Dietary Manager’s food safety program
- NEHA certificate program
- SNA certified
- Other, please specify____________________

**H -15.** Are you required by your local health department to be food safety certified?
- Yes
- No

**H -16.** Are you required by your school district to be food safety certified?
- Yes
- No

**H -17.** Does your district require kitchen managers to be food safety certified by Conference of Food Protection?
- Yes
- No

**H -18.** Does your district require all foodservice staff to be certified in food safety?
- Yes
- No

**H -19.** 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
- 21 years or more

**H -20.** How many total years have you worked in the foodservice industry (hotel, restaurant, critical care, college dining, school foodservice, etc.) setting?
- Less than 1 year
- 1-5 years
- 6-10 years
- 11-15 years
- 16-20 years
- 21 years or more

**H -21.** What is your gender?
- Female
- Male

**H -22.** What is your age?
- Less than 25
- 26-35
- 36-45
- 46-55
- 56-66
- 67 or more

If you would like a copy of the results, please return your business card or your name and mailing address on a separate sheet of paper in the return envelope.

Thank you for your interest.

Cynthia
APPENDIX N. SCHOOL BUSINESS OFFICIAL CONTACT LETTER

November, 2008

Dear School Business Administrator,

This packet of material contains the survey you were notified about earlier this week. The survey data will be part of the research project for completion of my doctoral degree from Iowa State University. The research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004. Other areas that will be measured are attitudes toward staff food safety training, personal, and school district characteristics.

School Foodservice Directors and School Business Administrators from the same K-12 public school district with enrollments between 2,500 and 25,000 located in the Mid-Atlantic geographic USDA region states in the continental United States that comprise the Mid-Atlantic geographic USDA region are being sent surveys. It is imperative that we receive a response from those selected to participate to ensure the findings accurately reflect this population.

We ask that you take the 20 minutes or so that will be needed to complete this one time only survey. It will be easier to complete the survey if you have ready access to the following data for the year ending, May, 2008.

- Total school district expenditure budget for the 2007-2008 school year
- School district expenditure budget for training of staff for the 2007-2008 school year
- Number of FTE’s in the district for each of following categories of employees: teachers, administrators, and non-instructional/support staff

There is limited research about the extent and effects of the HACCP implementation mandate. Your response to this survey will greatly enhance our understanding of how polices are accepted and implemented in school districts, and what factors are believed to influence school administrators views about districts’ foodservice programs.
Special Instructions:
You will receive an envelope marked “SBO” and a paper survey. Please complete the survey, place it in the envelope marked “SBO” and return to your school foodservice director within 10 days of receiving the packet. Then the school foodservice director will combine your survey with the completed FSD survey and place both into the self-addressed envelope, seal it, and return to me.

Your participation in this research is, of course, voluntary. Your confidentiality and anonymity are assured. Return of the survey to me is your implied consent for your responses to be compiled with others. Although the survey is coded to allow for follow-up with non-respondents, you will not be individually identified with your questionnaire or responses. Please understand that use of this data will be limited to this research, as authorized by Iowa State University (located in Ames, Iowa). Results may ultimately be presented in formats other than the dissertation such as journal articles, or conference presentations, but the data will be summarized. You also have the right to express concerns to me at the number below, my major professor Dr. Catherine Strohbehn, and/or the ISU Institutional Review Board.

We greatly appreciate your participation in this research. Please return the survey in the enclosed. This will save a follow-up mailing to you.

Thank you for your interest and participation in this study. We genuinely appreciate your time.

Cynthia Dawson Van Druff, M. Ed., SNS
PhD Candidate, Iowa State University
Director of Food Services
Upper Moreland School District
Willow Grove, PA
E-mail: cindy720@iastate.edu
Phone: 215-830-1522

Catherine Strohbehn, PhD, RD
Adjunct Associate Professor/HRIM
Extension Specialist
Iowa State University
Ames, Iowa
Email: cstrohbe@iastate.edu
Phone: 515-294-3527
APPENDIX O. SCHOOL BUSINESS OFFICIAL SURVEY

PART A  School District Policies

Instructions: Please respond to the following questions about district board-level policies related to food safety and your rating of importance of such policies (whether they currently exist or not in your district). Select a "Yes" or "No" to indicate if the district board level-policy currently exists and rate the level of importance using a 5-point rating scale where 5 – Very Important and 1 – Very Unimportant.

<table>
<thead>
<tr>
<th>Policy Exists</th>
<th>Importance of Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>NO</td>
</tr>
</tbody>
</table>

A-1. How important is it to have a district board-level policy about food safety?

A-2. How important is it to have a district board-level policy about kitchen and facility use for purposes other than the Child Nutrition Program?

A-3. How important is it to have a district board-level policy concerning foods prepared at home for resale at school/district sponsored events? (For example, bake sale or hoagie fund raiser)

A-4. How important is it to have a district board-level policy for foods prepared at home for use in classroom parties, celebrations, and treats?

A-5. How important is it to have a district board-level policy for foods prepared at home for use in covered dish dinners?

A-6. How important is it to have a district board-level policy requiring ALL district staff to be trained in food safety and sanitation? (Including Administrators, principals, secretaries, teachers, school foodservice staff, bus drivers, and custodians).

A-7. How important is it to have a district board-level policy requiring ALL school foodservice staff to be trained in food safety and sanitation?

A-8. How important is it to have a district board-level policy for volunteers requiring training in food safety and sanitation? (For example, all or those who work with any type of food preparation or service?)

A-9. Do you think that district board-level polices supporting safe food practices can help reduce foodborne incidences?

- Yes
- No
- Not sure
- Don’t know

A-10. Please identify which factors you think would most likely positively influence district administration support and result in district funds for food safety training? (Select all that apply).

- Mandated by state or federal agencies
- District board-level policy
- Required component of the Coordinated Review Effort/School Meals Initiative (CRE/SMI) review
- Corrective action need noted during the CRE/SMI review
- Knowledgeable foodservice director

- Public relations and media attention to food safety
- Foodborne illness outbreak in a district school
- Parental demands
- Food product recall
Part B
What do you know?
Instructions: Please answer the following questions about the food safety policy mandates in the Child Nutrition and WIC Reauthorization Act of 2004 (P.L. 108-265).

B-1. On a scale of 1-5, with 5 = Very Familiar, how familiar are you with P.L. 108-265?
☐ 5 Very Familiar
☐ 4 Somewhat Familiar
☐ 3 Familiar
☐ 2 Unfamiliar, but have heard of it
☐ 1 No knowledge of the law

B-2. How did you learn of the requirements for HACCP food safety implementation? (Check all that apply).
☐ At a local or regional school business meeting
☐ At a national school business meeting
☐ From my superintendent
☐ From my school foodservice director
☐ From my state agency the Department of Education/Agriculture
☐ From the USDA Guidance document
☐ Other source: please identify

B-3. Based on your understanding, what elements were to be included in a school district’s HACCP plan? (Check all that apply).
☐ Overview of school district
☐ Description of each school foodservice facility in the district
☐ Meals served by federal nutrition program
☐ Meal times
☐ Organizational chart of school foodservice staff
☐ Kitchen equipment and layout
☐ Menu
☐ Description of district procurement process including purchasing, preparation of bid documents, delivery schedule, truck inspection reports, receiving records, and assurance of vendors’ HACCP plans
☐ Standard Operating Procedures (SOPs)
☐ Food items by category
☐ Monitoring responsibilities
☐ Corrective actions
☐ Training
☐ Recordkeeping

Part C
What about your district?
Instructions: Please answer the following questions about the district and district support for training during the 2007-2008 school year.

C-1. Please estimate the total hours provided through in-service, on-site training, and external training to the following groups?

☐ Professional staff
☐ Administrative staff
☐ Non-certified school foodservice staff
☐ Certified school foodservice professional staff
☐ Do not know

Staff Information
C-2. How many non-certified staff members are employed in your district (employees and non-instructional/support staff)?
☐ Total number of non-certified staff
☐ FTE non-certified

C-3. How many professional staff members are employed in your district? (teachers, nurses, counselors)
☐ Total number of professional staff
☐ FTE professional

C-4. How many administrators are employed in your district? (Principals, district-wide supervisors)
☐ Total number of administrative staff
☐ FTE administrative

C-5. How many non-certified school foodservice staff members are employed in your district?
☐ Total number of non-certified foodservice staff
☐ FTE non-certified foodservice
C- 6. How many professional school foodservice staff are employed in your district?
   ___ Total number of professional foodservice staff
   ___ FTE professional foodservice staff

C- 7. Are there district requirements for training of all non-certified staff (not just foodservice)?
   □ Yes  □ No  □ Don’t Know

C- 8. Please identify minimum training hours required by district for staff in these groups. If none is required, put zero.
   ___ Non-certified staff
   ___ Professional Staff
   ___ Administrative staff
   ___ Non-certified staff (SFS)
   ___ Professional school foodservice (SFS)

C- 9. Please estimate percent of the district’s general fund budget allocated for required training during the 2007-2008 year. _________

Annual training information for SFS staff

C- 10. What was the source of funding for training of school foodservice program staff? (Check all that apply).
   □ General Fund
   □ Foodservice Fund
   □ Corporate donation
   □ Other funding sources: Please identify

C- 11. From the funding identified in C-10, what was the percent budgeted for school foodservice non-certified staff training during the 2007-2008 year? _________

In-Service Day Training for school foodservice staff

C- 12. Are school foodservice staff paid to attend district training on in-service days?
   □ Yes  □ No  □ Don’t Know

C- 13. Did school foodservice staff participate in any district in-service training workshops during the 2007-2008 school year?
   □ Yes  □ No - skip to C 15.
   □ Don’t Know - skip to C 15.

C- 14. What estimated percent of school foodservice staff attended district in-service training workshops (average attendance) during the 2007-2008 school year?
   □ 0-□  □ Less than 25%
   □ Between 26% and 50%
   □ Between 51% and 75%
   □ Between 76% and 99%
   □ 100%

C- 15. What topics presented at district in-service trainings were school foodservice staff required to attend and included as a work day? (Check all that apply).
   □ Allergy awareness
   □ Blood borne pathogens
   □ Bullying
   □ Cardio Pulmonary Resuscitation (CPR)
   □ Swedish Heimlich Maneuver
   □ Automated External Defibrillator (AED)
   □ Diversity training
   □ Nutrition Education
   □ Healthy school environment
   □ First Aid
   □ Fire Safety
   □ Food Safety
   □ Kitchen Safety (knife skills, safe lifting, etc.)
   □ Material Safety Data Sheets (MSDS) for chemical use
   □ School safety and Security
   □ Sexual Harassment
   □ Wellness/healthy behaviors
   □ Other programs: Please identify

Professional development for SFS director

C- 16. How many paid professional development days were included in the school district’s foodservice director’s employee agreement/contract during the 2007-2008 school year?
   _________ Days
   _________ How many days were actually used?

C- 17. During the 2007-2008 school year, what was the percent of money allotted from the General Fund budget for the school foodservice director’s professional development? _________

C- 18. During the 2007-2008 school year, what was the percent of money allotted from the Foodservice budget for the school foodservice director’s professional development? _________
Part D
What about you and your school district?
Instructions: Please answer the following questions about you and your school district.

D-1. What was your district’s foodservice total expenditure budget (food/labor/benefit costs/equipment/depreciation, etc.) for the 2007-2008 school year? $___________

D-2. Is the district’s foodservice director required by the district to be certified in food safety? Certification refers to a program such as ServSafe® by the National Restaurant Association. (Select one).
☐ Yes ☐ No ☐ Don’t Know

D-3. Are the district’s foodservice kitchen managers required to be certified in food safety? Certification refers to a program such as ServSafe® by the National Restaurant Association. (Select one).
☐ Yes ☐ No ☐ Don’t Know

D-4. Is your school district’s foodservice program self-operated? This means all staff members (management and hourly) are employed by the school district and a contract management company or consultant is not used. (Select one)
☐ Yes ☐ No ☐ Other, please describe

D-6. Does the district’s foodservice program receive any money from the General Fund? (Select one).
☐ Yes ☐ No ☐ Don’t Know

D-7. What is the goal for the district’s foodservice program financial operational effectiveness? (Select one).
☐ Break-even ☐ Generate a profit ☐ Minimize losses ☐ Don’t know

D-8. Are you a member of your State Association of School Business Officials? (Select one).
☐ Yes ☐ No

D-9. Are you a member of the International Association of School Business Officials? (Select one).
☐ Yes ☐ No

D-10. Which of the following describes your highest level of education? (Select one)
☐ High school diploma ☐ Some college
☐ Associate degree – (2 year degree) ☐ Bachelor degree
☐ Some graduate work ☐ Graduate degree
☐ Doctoral degree ☐ Other

D-11. 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 ☐ 21 years or more

D-12. How many total years of school business administration do you have including your current position?
☐ Less than 1 year ☐ 1-5 years
☐ 6-10 years ☐ 11-15 years
☐ 16-20 years ☐ 21 years or more

D-13. Have you held any other school related positions prior to your current position?
☐ Yes ☐ No
If yes, please list what position(s).________________________________________

Thank you for completing the survey. Please place the completed survey in the corresponding envelope marked SBO, seal it, and return to your school foodservice director. If you would like a copy of the results please include your business card with the survey. Your business card will be separated from the survey.
APPENDIX P. FOODSERVICE DIRECTOR REMINDER POSTCARD

November, 2008

Dear School Foodservice Director,

About three weeks ago you received a short survey by mail. Perhaps your completed the survey and it is in the mail. If not, please consider returning the packet today.

The purpose of the survey is to assess the level of district support for food safety training and implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004.

This is regional survey of directors just like you. We need input from those in charge of Child Nutrition Programs that fully understand the implications of the HACCP mandate.

If you have lost or misplaced your survey packet please contact me by e-mail for a replacement copy. Please send me an e-mail with “FOOD SAFETY SURVEY-FSD” in the text box to cindy720@iastate.edu.

The survey packet will contain complete instructions for you and your school business administrator along with a self-addressed return envelope.

Thank you,

PhD Candidate, Iowa State University
Director of Food Services
Upper Moreland School District
Willow Grove, PA
E-mail:cindy720@iastate.edu
Phone: 215-830-1522

Adjunct Associate Professor/HRIM
Extension Specialist
Iowa State University
Ames, Iowa
Email:cstrohbe@iastate.edu
Phone-515-294-3527
APPENDIX Q. SCHOOL BUSINESS OFFICIAL REMINDER POSTCARD

November, 2008

Dear School Business Administrator,

About three weeks ago you received a short survey by mail. Perhaps you have already completed the survey and returned it to your school foodservice director. If not, please consider completing so the packet can be returned today.

The purpose of the survey is to assess the level of district support for food safety training and implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004.

This is a regional survey of school business Administrators just like you. We need input from those who oversee the Child Nutrition Programs and that fully understand the implications of the HACCP mandate.

If you have lost or misplaced your survey packet please contact me by e-mail for a replacement copy. Please send me an e-mail with “FOOD SAFETY SURVEY-SBO” in the text box to cindy720@iastate.edu. A new packet will be sent via your school foodservice director.

Thank you,

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Director of Food Services
Upper Moreland School District
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E-mail:cindy720@iastate.edu
Phone: 215-830-1522

Adjunct Associate Professor/HRIM
Extension Specialist
Iowa State University
Ames, Iowa
Email:cstrohbe@iastate.edu
Phone-515-294-3527
December, 2008

Survey Reminder

Dear Colleague,

Over three weeks ago you received a packet of material containing a survey for you and your School Business Official. To date we have not received your returned packet. Please return by the end of next week. Each completed survey benefits you and other foodservice directors. This is a very focused regionalized survey and each response is very important to our region. Your district is a vital to our study. As a thank you, each district will receive a copy of the results, please indicate by including your business card with the completed survey.

The research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of district support for food safety training and implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004. Other areas that will be measured are food safety beliefs, attitudes toward staff training, personal and district characteristics.

Only 498 School Foodservice Directors and School Business Administrators from the same K-12 public school districts with enrollments between 2,500 and 25,000 located in the Mid-Atlantic geographic USDA region states in the continental United States were include in this study and received surveys. It is imperative that we receive a response from those selected to participate to ensure the findings accurately reflect this population.

We ask that you take the 20 minutes or so that will be needed to complete this one-time only survey. It will be easier to complete the survey if you have ready access to the following data for the year ending May, 2008:

- Total district enrollment
- Combined percent of children approved for free and reduced meals
- Total foodservice department expenditure budget for the 2007-2008 school year
- Total number of FTE’s in the foodservice department (including secretary support, warehouse staff, and truck drivers)
- Information on number of staff with food safety certifications, hours of training for SNA certification, National Restaurant Association, and/or local health department
- District foodservice sites’ 2007-2008 inspection reports from local health department

There is limited research about the extent and effects of the HACCP implementation mandate. Your response to this survey will greatly enhance our understanding of how polices are accepted and implemented in school districts, and what factors are believed to influence school administration support for the district’s foodservice program.
Special Instructions:
There are two surveys in your packet. The survey marked FSD, is your survey. The survey in the unsealed inner envelope marked SBO is for your School Business Administrator. Please give the survey packet marked SBO to your School Business Administrator. They are asked to complete the survey, seal it, and return to you within 10 days of receiving the packet. Place both into the self-addressed envelope, seal it, and return to me.

Your participation in this research is, of course, voluntary. Your confidentiality and anonymity are assured. Return of the surveys is implied consent for responses to be compiled with others. Although the survey is coded to allow for follow-up with non-respondents, you will not be individually identified with your questionnaire or responses. Please understand that use of this data will be limited to this research, as authorized by the Iowa State University, (located in Ames, Iowa). Results may ultimately be presented in formats other than the dissertation, such as journal articles, or conference presentations, but the data will be summarized. You also have the right to express concerns to me at the number below, to my major professor Dr. Catherine Strohbehn, and/or the ISU Institutional Review Board.

We greatly appreciate your participation in this research. Please return the survey within two weeks of the posted date on the outer mailing envelope in the enclosed, self-addressed, stamped envelope. This will save a follow-up mailing to you.

If you are having difficulty in completing the survey, please feel free to send me an e-mail at cindy720@iastate.edu or call at 215-830-1522. I will be looking forward to receiving your district information.

We genuinely appreciate your time.

PhD Candidate, Iowa State University
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Adjunct Associate Professor/HRIM
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Ames, Iowa
Email: cstrohbe@iastate.edu
Phone: 515-294-3527
December, 2008

Survey Reminder

Dear School Business Administrator,

About three weeks ago a packet of material containing a survey for you and your School Food Service Director. To date we have not received your returned packet. Please return by the end of next week. Each completed survey benefits you and other foodservice directors. The survey data will be part of the research project for completion of my doctoral degree from Iowa State University. The research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004. Other areas that will be measured are attitudes toward staff food safety training, personal, and school district characteristics.

School Foodservice Directors and School Business Administrators from the same K-12 public school district with enrollments between 2,500 and 25,000 located in the Mid-Atlantic geographic USDA region states in the continental United States that comprise the Mid-Atlantic geographic USDA region are being sent surveys. It is imperative that we receive a response from those selected to participate to ensure the findings accurately reflect this population.

We ask that you take the 20 minutes or so that will be needed to complete this one time only survey. It will be easier to complete the survey if you have ready access to the following data for the year ending, May, 2008.

- Total school district expenditure budget for the 2007-2008 school year
- School district expenditure budget for training of staff for the 2007-2008 school year
- Number of FTE’s in the district for each of following categories of employees: teachers, administrators, and non-instructional/support staff

There is limited research about the extent and effects of the HACCP implementation mandate. Your response to this survey will greatly enhance our understanding of how polices are accepted and implemented in school districts, and what factors are believed to influence school administrators views about districts’ foodservice programs.
Special Instructions:
You will receive an envelope marked “SBO” and a paper survey. Please complete the survey, place it in the envelope marked “SBO” and return to your school foodservice director within 10 days of receiving the packet (TBD). Then the school foodservice director will combine your survey with the completed FSD survey and place both into the self-addressed envelope, seal it, and return to me.

Your participation in this research is, of course, voluntary. Your confidentiality and anonymity are assured. Return of the survey to me is your implied consent for your responses to be compiled with others. Although the survey is coded to allow for follow-up with non-respondents, you will not be individually identified with your questionnaire or responses. Please understand that use if this data will be limited to this research, as authorized by Iowa State University (located in Ames, Iowa). Results may ultimately be presented in formats other than the dissertation such as journal articles, or conference presentations, but the data will be summarized. You also have the right to express concerns to me at the number below, my major professor Dr. Catherine Strohbehn, and/or the ISU Institutional Review Board.

We greatly appreciate your participation in this research. Please return this second copy of the survey in the enclosed envelope. This will save a follow-up mailing to you.

If you are having difficulty in completing the survey, please feel free to send me an e-mail at cindy720@iastate.edu or call at 215-830-1522. I will be looking forward to receiving your district information.

Thank you for your interest and participation in this study. We genuinely appreciate your time.

Cynthia Dawso Van Druff, M. Ed., SNS
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Catherine Strohbehn, PhD, RD
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APPENDIX T. STATE AGENCY CONTACT LETTER

October, 2008

Dear ,

This packet of material contains a courtesy copy of the questions about the school foodservice programs in your state. The survey data will be part of the research project for completion of my doctoral degree from Iowa State University. The research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004. Other areas that will be measured are attitudes toward staff food safety training, personal, and school district characteristics.

School Foodservice Directors and School Business Administrators from the same K-12 public school districts with enrollments between 2,500 and 25,000 located in the Mid-Atlantic geographic USDA region states in the continental United States and state agency directors are included in this study. It is imperative that we receive a response from those selected to participate to ensure the findings accurately reflect this population.

We ask that you set aside 10 minutes to address the enclosed list of questions for a brief survey over the phone.

There is limited research about the extent and effects of the HACCP implementation mandate. Your response to this survey will greatly enhance our understanding of how the mandated food safety polices are overseen in school districts in your state.

Your participation in this research is, of course, voluntary. Your confidentiality and anonymity are assured. Verbal response to the survey is your implied consent for your responses to be compiled with others. You will not be individually identified with your questionnaire or responses. Please understand that use if this data will be limited to this research, as authorized by Iowa State University (located in Ames, Iowa). Results may ultimately be presented in formats other than the dissertation such as journal articles, or conference presentations, but the data will be summarized. You also have the right to express concerns to me at the number below, my major professor Dr. Catherine Strohbehn, and/or the ISU Institutional Review Board.
We greatly appreciate your participation in this research. Please select your first and second choice of phone survey times.

Monday, (TBD)   ___ 8:00 a.m.  10:00 a.m.  1:00 p.m.  
                ___ 8:30 a.m.  10:30 a.m.  1:30 p.m.

Tuesday, (TBD)    ___ 8:00 a.m.  10:00 a.m.  1:00 p.m.  
                ___ 8:30 a.m.  10:30 a.m.  1:30 p.m.

Wed., (TBD)  ___ 8:00 a.m.  10:00 a.m.  1:00 p.m.  
               ___ 8:30 a.m.  10:30 a.m.  1:30 p.m.

What is the best phone number for contact: _______________________________________

Please send me an e-mail to cindy720@iastate.edu within two weeks of receiving this letter and include your first and second choice of phone survey times. I will follow up with a confirmation schedule.

Thank you for your interest and participation in this study. We genuinely appreciate your time.

Cynthia Dawso Van Druff, M. Ed., SNS
PhD Candidate, Iowa State University
Director of Food Services
Upper Moreland School District
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Catherine Strohbehn, PhD, RD
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APPENDIX U. STATE AGENCY SURVEY

Instructions: There are two parts to this survey; Part A and Part B. We will discuss the following questions during our phone survey interview. Please feel free to add any other relevant information related to food safety aspects in your state for part B. Thank you

PART A

Food Safety questions and information for your state

1. Please identify the current Food Code in use in your state.

2. Was HACCP mandated in schools in your state by your agency prior to the Child Nutrition and WIC Reauthorization Act of 2004? If so, when?

3. Are there any other regulations or processes beyond USDA guidance required by your state?

4. Will you require school districts to forward food safety plans to be submitted to the State Agency for review?

5. When are HACCP plans reviewed in each district for each school with a NSLP and or SBP?

6. During the CRE/SMI review process how will the school food safety plan be reviewed?

7. Do you believe all districts in your state have food safety plans in place by school site?

8. What state agency or department oversees sanitation inspections for school districts?

9. Who conducts sanitation inspections in your state?

10. What is the frequency of actual health inspections in schools in your state ____? 

11. Is there a standard sanitation inspection form used statewide?

12. Please identify the total number of public schools in your state.

Part B

Information you’d like to share.
Dear

Thank you. Earlier this week, you agreed to participate in the survey for school foodservice programs in your state.

I look forward to learning more about school foodservice safety plans in your state.

Please see your confirmed time below.

We greatly appreciate your participation in this research. Please feel free to use your courtesy survey copy as a guide for our conversation.

Date: ___ 8:00 a.m. 10:00 a.m. 1:00 p.m.

Thank you for your interest and participation in this study. We genuinely appreciate your time.

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Extension Specialist
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Phone: 515-294-3527
APPENDIX W. STATE AGENCY PHONE SURVEY

Good Morning,

As noted in my pre-survey letter, you were available for a short phone survey at this time, I trust this is still good time.

We will discuss the following questions during our phone survey interview. If you feel uncomfortable in answering, please say “My position prevents me from answering this question” and we will skip this question.

Please feel free to add any other relevant information related to food safety aspects in your state at the close of Part A.

PART A

Food Safety questions and information for your state

Please identify the current Food Code in use in your state.

Was HACCP mandated in schools in your state by your agency prior to the Child Nutrition and WIC Reauthorization Act of 2004?
If so, when?

Are there any other regulations or processes beyond USDA guidance required by your state?

Will you require school districts to forward food safety plans to be submitted to the State Agency for review?

When are HACCP plans reviewed in each district for each school with a NSLP and or SBP?

During the CRE/SMI review process how will the school food safety plan be reviewed?

Do you believe all districts in your state have food safety plans in place by school site?

What state agency or department oversees sanitation inspections for school districts?

Who conducts sanitation inspections in your state?

What is the frequency of actual health inspections in schools in your state _______ ?

Is there a standard sanitation inspection form used statewide?

Please identify the total number of public schools in your state.
Part B

Information you’d like to share.

Thank you very much. If you would like a copy of the research study, please indicate by sending an e-mail to cindy720@iastate.edu.

Thank you
APPENDIX X. FOODSERVICE DIRECTOR FINAL REMINDER

December, 2008

Survey Reminder

Good Morning or Afternoon,

This is Cynthia Dawso Van Druff, the Food Service Director from Upper Moreland Township School District in Willow Grove, Pennsylvania and doctoral candidate from Iowa State. Several weeks ago, you were invited to become part of a research study especially tailored and created for the MARO region.

The packet contained a survey for both you and your School Business Official. To date we have not received your returned packet.

There are only 498 schools in this study, to perform the analysis and share meaningful data I just need about (X) more surveys.

What do you need? A new packet, I can drop in mail today. Is your address still?

As you recall, the research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of district support for food safety training and implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004.

Thanks and we are glad we can count on you. As a thank you, each district will receive a copy of the results, please indicate by including your business card with the completed survey.

The research goal is to assess perceptions held by school foodservice directors and school business officials in the Mid-Atlantic region about levels of district support for food safety training and implementation of a food safety plan mandated in the Child Nutrition and Reauthorization Act of 2004.

We genuinely appreciate your time.

PhD Candidate, Iowa State University  Adjunct Associate Professor/HRIM
Director of Food Services  Extension Specialist
Upper Moreland School District  Iowa State University
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E-mail:cindy720@iastate.edu  Email:estrohbe@iastate.edu
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