



NFSMI Research Summary

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Please note that this study was published before the implementation of Healthy, Hunger-Free Kids Act of 2010, which went into effect during the 2012-13 school year, and its provision for Smart Snacks Nutrition Standards for Competitive Food in Schools, implemented during the 2014-15 school year. As such, certain research may not be relevant today.

NFSMI Research Summary is a continuing series of summaries reporting recently completed research funded by the National Food Service Management Institute. This research has been produced by the National Food Service Management Institute–Applied Research Division, located at The University of Southern Mississippi with headquarters at The University of Mississippi. Funding for the Institute has been provided with federal funds from the U.S. Department of Agriculture, Food and Nutrition Service, to The University of Mississippi. The mission of NFSMI is to provide information and services that promote the continuous improvement of Child Nutrition Programs, such as: School Meals Programs, Summer Food Service Program, and Child and Adult Care Food Program.

Recently Completed Research

School Wellness Policy: Readiness of Principals to Implement Changes

The purpose this study was to determine principals' readiness to implement the local wellness policy using stages of change transtheoretical model. Data were collected through a mailed survey in the spring of 2006, prior to mandated implementation of the local wellness policy. Objectives were to assess the prevalence of principals who are actively participating in the process of developing a wellness policy, to identify the attitude and readiness for change of elementary, middle/junior high, and high school principals toward the development of a local wellness policy, and to identify principals' knowledge of the wellness policy, perceived barriers and benefits related to implementation of the policy, and level of self-efficacy as it related to implementation of the wellness policy. A total of 692 questionnaires were returned for a response rate of 21%. Of the 692 that were returned, 562 were used in the final data analysis. All USDA regions were represented in the return. Descriptive statistics included means, standard deviations, and frequencies of total responses. MANOVA was used to determine if the stage of readiness to change was related to knowledge, decisional balance, or self efficacy. Cross Tabulations were used to compare demographic characteristics against stage of readiness to implement the policy. Nearly 19% of the respondents indicated they had never heard of the legislation requiring the implementation of a wellness policy. Of those that had heard of the policy, 6 were in contemplation (0.9%), while 21.9 % were in maintenance, as relating to the transtheoretical model. The majority of the school principals indicated they were preparing to implement the policy (45%). Principals were most knowledgeable about the inclusion of a physical education component in the curriculum (4.3 + .9) and preventing the sale of carbonated beverages in the vending machines (4.0 + .9). Of the five questions that pertained to the benefits of implementing a wellness policy, the principals most strongly believed that a wellness policy would help improve the health of the students (3.6 + 1.0). However, they did not believe attendance would increase as a result of implementation of the wellness policy (2.5 + 1.1). The

principals perceived loss of revenue from vending as the most negative aspect of the policy (3.4

+ 1.3). On the other hand, they did not feel that participation in the lunch program would decrease (2.3 + 1.0) or that teachers would have difficulty providing rewards in the classroom (2.2 + 1.1). Overall, the principals felt most confident that they could still implement the policy even if students were upset about the removal of vending machines (3.4 + 1.3). Incorporation of physical activity into the curriculum and the current use of physical education in many schools, continuation of activity did not appear to be an area of concern for the principals. Principals were bothered with the thought of disallowing vending from their school, potentially decreasing revenue.

Identification of Resources and Practices That Increase Accountability in the National School Lunch Program (NSLP) Snack Service Provided to Afterschool Care Programs

The purpose of this study was to identify resources and best practices that can be used to assist school districts in increasing accountability in the NSLP snack service. The research design used a case study methodology that included direct observation, systematic interviewing, and a review of school nutrition program records related to the NSLP snack service in afterschool care programs. Prior to a site visit, each participant was mailed a questionnaire to collect demographic information about the school district and the NSLP snack service to afterschool care programs. On-site data collection occurred during a one-day site visit in each school district. Data were organized, tabulated, and cross checked from each individual case study. The case study districts had a combined total of 43 afterschool care sites. The number of snacks served in the case study districts ranged from an average of 74 to 750 per day. Thirty-seven snack sites (86%) qualified to serve all snacks free to participating students. Snacks were most often served in either the classroom or cafeteria dining room. Among the four school districts participating in the case study, two districts provided day-to-day management of the afterschool care programs, while Century 21 provided management at the other two sites. The afterschool care programs were sponsored by the case study districts and the school food authority provided the required oversight of the NSLP snack service. Accountability for compliance with USDA regulations was a shared responsibility between the School Nutrition Program (SNP) directors and afterschool care staff. Job assignments varied from district to district. Afterschool care program coordinators were responsible for attendance rosters or sign-in sheets in all four districts. Only one SNP department maintained control of all activities related to serving and counting snacks. The afterschool care staffs were responsible in the other three districts for documenting the number of snacks served, reconciling the number served with attendance, and providing the documentation to the SNP department. Each of the school districts had an established system for ensuring that only one NSLP snack per child was recorded and claimed for reimbursement. The NSLP snack menu, along with production records, served as the documentation for meal pattern compliance in all of the case study districts. All afterschool program sites used cycle menus that could be modified if necessary. Two districts served only two meal components daily and children were required to take both components. One district served three meal components and although students were encouraged to take all three, the third snack component was optional. The fourth district alternated between serving two and three meal components during the month of the site visit. Copies of all snack menus were maintained on file in each district office. Study participants ranked six specific considerations important to producing and serving NSLP snacks for afterschool programs in their districts, they were: cost, labor, nutritive value, prepackaged product, need for refrigeration, and student preference. Food safety was a high priority in all

districts. There were strict procedures in place to ensure safe handling of snacks during transportation, storage, and service. None of the districts in the case study elected to serve snacks that required heating. All participating districts provided training related to implementing the NSLP snack service in afterschool care programs to ensure accountability and improve program quality. Topics for training included food safety, USDA regulations, verification of meal components, and expectations for the afterschool care staff in maintaining accountability in the service of NSLP snacks. A review of the NSLP snack service was conducted twice a year as required by USDA in all school districts in the study. The first review occurred during the first four weeks the snack service was in operation. The second review occurred at different times throughout the school year. All districts complied with review and monitoring requirements. Review documents were filed in the SNP district office.

Cost Variables Associated with Producing and Serving a Reimbursable National School Lunch Program Snack for Children in Afterschool Care Programs

The purpose of this study was to identify costs associated with producing and serving these snacks and determine how those costs are distributed. The research design used a case study methodology that included direct observation, systematic interviewing, and review of School Nutrition Program (SNP) records. On-site data collection occurred in four school districts during a one-day visit in each school district. The case study districts had a combined total of 43 afterschool program snack sites. Data were organized, tabulated, and cross checked from each site visit. A meal equivalent ratio of three snacks equate to one lunch was used to assess comparable costs for a NSLP snack served in the case study districts. To determine the prorated cost of producing a snack that included food, labor, and all other expenses to the SNP, a three-step calculation was made by converting all food and meal sales to meal equivalents, identifying the cost to produce one meal equivalent, and dividing the meal equivalent by three to calculate the prorated cost of producing and serving a snack. The number of snacks served in the case study districts ranged from an average of 74 to 750 per day. Thirty-seven snack sites (86%) qualified to serve all snacks free to participating students. Although schools in the case study districts calculated the cost of food for snacks, none tracked specific costs for labor, supplies, and general overhead associated with producing and serving a NSLP snack. The average daily food costs reported by the school districts ranged from \$0.32 to \$0.53 for snacks during the month prior to the site visit. School districts in the study used meal equivalent ratios to determine meal and snack costs, however the meal equivalent ratio for snacks varied among districts from two snacks equal one standard lunch to four snacks equal one standard lunch. To ensure consistency in data analysis for this study, the researcher used the NFSMI meal equivalent ratio of three snacks equal one lunch to calculate the cost of producing and serving a NSLP snack. The results ranged from a cost of approximately \$0.71 to \$0.77 to produce and serve snacks to students in afterschool programs in the case study districts, based on 2005 pricing. SNP directors indicated that factors such as the number of students served, differing labor requirements, and whether or not supplies were needed in the snack service had an impact on the overall cost to produce and serve a NSLP snack. Other issues that had an effect on the cost of producing and serving NSLP snacks were student preferences for more expensive snack items and overproduction of snacks due to inaccurate orders.

Feasibility of Offering Reimbursable Meals to Students through Vending Machines

The purpose of this study was to identify the foodservice system operational requirements for offering reimbursable meals to students through vending machines. In addition, barriers to implementation and criteria for determining success were investigated. The research design used a case study methodology that included direct observation, systematic interviews, and review of school nutrition program records related to the vended reimbursable lunch. Prior to a site visit, each participant was mailed a questionnaire to collect demographic information about the school district and the vended reimbursable lunch. On-site data collection occurred during a one-day site visit in each participating school district. Data were organized, tabulated, and cross checked from each individual case study. Vending machines in a school in each participating district successfully vended reimbursable lunches to high school students. Three considerations were critical to this outcome; regulations, technology, and support. The ability to integrate point-of-sale software, cashless and vending machine technology, and school district electronic record keeping applications was the key element in implementing electronic compliance with United States Department of Agriculture (USDA) National School Lunch Program (NSLP) regulations. This interface of technology with regulations facilitated identification of legitimate reimbursable lunches; accurate provision of free and reduced price meals to eligible students; correct charges for full-pay meals, second meals and à la carte items, and maintenance of confidentiality of meal eligibility category. The process entailed overcoming barriers and developing solutions to novel obstacles. All involved in the project stressed that it was possible only with the enthusiastic support of SNP and school district administrators, principals, and state agency personnel responsible for overseeing the local SNP.

Exploring the Need for Web Based Training among School Nutrition Directors

Online learning and Web-based training (WBT) has the potential to meet the diverse learning needs of school nutrition directors (SND), their opinions and interests related to WBT are unknown. Therefore, the purpose of this study was to conduct a WBT needs assessment. The two primary objectives of this needs assessment research were to qualitatively explore their need and interest in utilizing WBT, and quantitatively determine their perceived knowledge, skill, training, and interest in utilizing WBT within the 14 established research-based functional areas. Participants in the qualitative structured-interviews included 42 SNDs with an average of 3.1 (SD+4.6) years of director experience. There were no major differences identified between attendees and non-attendees. Results indicated that the majority of SNDs have the technology infrastructure needed to support WBT at work and at home. Thirty-eight (90%) reported interest in utilizing WBT to acquire knowledge, and 40 (95%) reported interest in WBT for practice activities to further improve skills. Benefits of WBT included convenience, opportunities to study unfamiliar areas in more detail and practice the skills, ability to gain knowledge and get current information, and accessibility of information. Barriers included lack of instructor/student interaction or feedback to questions, on-site interruptions or time, technology problems, and the motivation or discipline needed to complete assignments. The five functional areas with the highest interest rating and ranking for a WBT format included: (1) Sanitation, Food Safety & Employee Safety, (2) Financial Management and Record Keeping, (3) Nutrition and Menu Planning, and (4) Program Accountability. An overwhelming majority of SNDs expressed interest in utilizing WBT both to acquire knowledge and for practice activities to further improve

skills. It is feasible to suggest that preference for WBT may be more related to a lack of availability and resulting exposure, and less related to a lack of interest. This prospect can be supported by the fact that while only 16 (38%) SNDs reported participation in some form of previous WBT, at least 38 (90%) reported they would be interested in participating. Furthermore, the overall thematic counts indicate that SNDs identified substantially more benefits (n=135) of WBT as compared to barriers (n=77). Additionally, when asked to rate their interest (1=very disinterested, 5=very interested) in participating in WBT for each functional area, the overall mean rating across all functional areas was 4.0.

Exploring the Uniqueness of Child Nutrition Programs in Large School Districts

The purpose of this research study was to identify the unique issues associated with school nutrition programs in large school districts with student enrollment of 30,000 or greater. The specific objectives for the study were to determine operational issues and practices SN directors encounter in large school districts, identify characteristics and qualities needed to be a successful SN director in a large school district, and identify whether training is needed to develop these characteristics and qualities. Researchers developed a three-section survey from the qualitative data obtained during the expert panel discussion session. In the first section, participants indicated their agreement with 52 operational issues and practices related to SN operations in large school districts. Agreement was rated on a 4-point scale, ranging from 1 (strongly disagree) to 4 (strongly agree). Participants also indicated how often each operational issue/practice was encountered or performed by use of a 5-point scale that ranged from 0 (never) to 4 (daily). In section two, participants indicated how important each of 33 characteristics or qualities was to being a successful SN director in a large school district and also specified their opinion of the importance of training to develop these characteristics/qualities. In both instances, importance was rated on a 4-point scale, ranging from 1 (not important) to 4 (very important). In section three, participants provided additional information about themselves and their SN operation. The study sample represented 232 school districts in the seven USDA regions and rate of return was 42% from the SN directors. The majority of SN directors who responded to the survey were female (75.8%) with a Master's degree or higher (56.8%). They have worked in SN programs for 15 years or more (70.5%) and in their current position for less than ten years (59.9%). Over one-third (36.6%) had worked on the SN management team in their current district prior to taking the SN director position and 19.4% worked as a SN director in another large school district. Respondents were from all USDA regions, with the highest percentages from the Southeast (30.9%), Western (23.4%), and Southwest (16.0%) regions. More than one-half (55.8%) of SN directors were employed in districts ranging in size from 30,000 – 49,000 students while 10.5% of respondents work in districts with greater than 100,000 students. Results of this study suggest that the SN director position in a large school district is generally not an entry-level management position in SN and that those school district administrators who hire SN directors value prior management experience in large school districts. Current SN directors recognize the importance of experience on the SN management team in large districts as well as educational backgrounds in nutrition and/or business. Given the impending retirements of SN directors in large school districts and propensity of many SN directors to ascend from the ranks of the SN management team, there is a need to prepare middle management SN professionals and others to lead SN programs in large school districts. Respondents were from all seven USDA regions and represented districts containing 20 to over 150 feeding sites and student enrollments ranging

from 30,000 to over 100,000. Regardless of the size of school district, there was strong agreement in respect to the operational issues and practices encountered by SN directors in large school districts. In other words, SN directors, regardless of the size of their large school district, are encountering similar operational issues. Respondents rated 29 of the 33 characteristics and/or qualities needed by SN directors in large school districts 3.5 or greater on a 4-point scale, which signifies these characteristics and qualities are important or very important for a SN director to be successful. Regardless of school district size, there was strong agreement in respect to the characteristics and/or qualities needed by SN directors in large school districts. When asked to indicate the importance of training to develop these characteristics and/or qualities, the SN directors rated 31 of the 33 characteristics and/or qualities phrases 3.0 or greater on a 4-point scale, suggesting that school nutrition directors recognize that training is important to assist in the development of these leadership qualities. Over one-third (36.9%) of survey respondents indicated that they will be retiring in the next five years and another 14.7% are not sure if they will retire, indicating that there may be the impending retirement of 50% or more of these current directors of large SN programs within the next five years.

Competencies, Knowledge, and Skills of Effective School Nutrition Assistants and Technicians

This project focused on the school nutrition (SN) assistant/technician who works at the local school cafeteria under the direction of a SN manager. The objectives of this study were to identify the functional areas, competencies, knowledge, and skills needed by effective school nutrition assistants in the current SN environment, and determine at what point the SN assistant should be able to know/perform the knowledge/skill statement, at time of hire or after training. This study was conducted in two phases and SN professionals participated in both phases of the project. Phase I utilized an expert panel consisting of state agency personnel, SN directors, and SN managers to bring about agreement on functional areas for job duties performed by SN assistants/technicians. Expert panel participants arrived at consensus on the knowledge and skill statements needed in each functional area. NFSMI researchers grouped the knowledge and skill statements for each functional area into smaller categories and drafted competency statements. The Phase II review panel, consisting of state agency personnel, SN directors, and SN managers, were mailed a survey that asked them to verify whether the knowledge and skill statements are important to the job responsibilities of a SN assistant, determine at what point the SN assistant should be able to know or perform the knowledge or skill statement, at time of hire or after training, and confirm whether the competency statements are consistent with the supporting knowledge and skill statements. Six functional areas were identified that encompass the job duties of the SN assistant/technician: food production; sanitation, safety, and security; customer service; program regulations and accountability; equipment use and care; and professional excellence. In addition to these functional areas, 12 competencies, 45 knowledge statements, and 105 skill statements were confirmed by the Phase II review panel. From these knowledge and skill statements, the Phase II review panel only identified 37 statements as being necessary when SN assistants are hired. These findings suggest that training of SN assistants occurs after hire as few individuals are fully competent in all aspects of the job when hired. A research-based resource was developed as an outcome of this study.

In-Classroom Breakfast Programs: Best Practices

The purpose of this study was to determine best practices associated with in-classroom breakfast. Following a case study design, the researchers explored through interviews and observations the preparation, distribution, and service of in-classroom breakfast programs. Interviews were conducted with school nutrition directors, principals, teachers, and other school personnel. Participating school districts were selected based on recommendations of their state agency of operating an exemplary in-classroom breakfast program. The participating school districts represented four districts of varying sized in the Southeast, Mid-Atlantic, West, and Midwest USDA regions, with the pilot conducted in the Southeast region. Planning and implementation of an in-classroom breakfast program involved school nutrition personnel, school administrators, teachers, custodians, and parents. The distribution and service of in-classroom breakfast were customized to each school within the districts; therefore, the initial planning was time-consuming. In a ranking of menu planning considerations, directors ranked nutritive value, student preference, food cost, and food safety high. Additional considerations were prepackaging, heating and cooling requirements, labor cost, packaging requirements, and teacher requests. The SNP directors and managers showed exceptional planning, organizational, and communication skills. The SNP directors and supervisors maintained good communication with school principals. All SNP managers used color coding for labels to organize foods and deliveries, forms designed for in-classroom breakfast, regular communication with school personnel, students, and parents. The school nutrition personnel followed food safety and sanitation procedures and detailed schedules for breakfast deliveries. Accurate records for production and meal reimbursement categories were maintained. All three districts and the pilot district reported increased student participation in the breakfast program after implementation of in-classroom breakfast; improved nutrition intake for students does have an impact on student success and readiness for learning. Teachers and school administrators had positive impressions of in-classroom breakfast based on fewer tardy students, fewer disciplinary referrals, student focus on academics, and creation of a positive school culture. The planning for in-classroom breakfast should include menus, logistics of distribution and service including staffing, and record keeping. Continuous quality improvement techniques should be applied after implementation. The planning and implementation of in-classroom breakfast can be successful if a school team representing school nutrition, administration, teachers, custodians, students, and parents uses the best practice results from this study. The results of this study were used to develop a best practices resource to assist SNP directors interested in implementing or assessing existing in-classroom breakfast programs in their school district.

Investigation of school professionals' and parents' attitudes toward school wellness implementation in elementary schools

The purpose of this two phase research study was to identify attitudes of school nutrition directors, principals, teachers, and parents regarding a Local Wellness Policy (LWP) and barriers related to implementation of a LWP. Researchers also explored their views toward school meals, healthy food options, dining environment, and nutrition education in the school setting. In Phase one, focus groups were conducted with four school districts across the United States. Participants in the focus groups included a combination of teachers, parents, principals, school nutrition directors (SNA), and community professionals. Questions were used to obtain information

regarding attitudes and perceived benefits and barriers related to implementation of the wellness policy. The information gathered from the four focus group sessions was used to develop a quantitative questionnaire (Phase II of the research). The questionnaire that was developed was mailed to 700 SND, representing the seven USDA regions. Four identical survey packets were included in the mailing to the SND, one each for the SND, principal, teacher, and parent in the school district, for a total of 2800 questionnaires distributed nationwide. A total of 575 completed questionnaires were returned (20.5%). The groups of participants were almost equally divided, with principals representing the majority of the respondents (30.4%) and parents representing the smallest group (20%). More than half (57.4%) of those returning the survey had an active role in implementation of the wellness policy. Twenty-four percent stated that the policy was fully implemented, while 37% indicated the policy was partially implemented. However, over 28% were not sure of the level of implementation of the policy. *School meals meet USDA requirements* was ranked as the most important goal when implementing a LWP. *Physical education is included in the curriculum* was ranked second in importance, followed by *physical activity is part of the elementary school day*. The goal having the lowest importance ranking was *nutrition education is part of the elementary school day*. The goal with the highest mean score for level of attainment was *school meals meet USDA requirements*. *Physical education is included in the curriculum and physical activity is part of the elementary school day* were ranked as second and third attainment level goals. The top four importance goals were also ranked in the top four for the attainment level. Therefore, these findings indicate an attainment of what respondents perceived as important. *Nutrition education is part of the elementary school day* ranked last in importance and next to last in level of attainment. *Foods sold on campus include healthy choices* ranked as the least attainable goal, but ranked as important to very important to implementing a local wellness policy in their elementary school. Respondents ranked *encourage students to eat healthy, promote physical activity, and ensure that guidelines are met when implementing the policy* as the top three importance roles or responsibilities to implementing a LWP. Whereas the highest level of involvement was *create awareness of school wellness*, all other survey statements measuring respondents' level of involvement ranked somewhat involved to not involved. It was most strongly agreed that the wellness policy would *improve physical fitness among elementary students*. This benefit was followed by *promote in life-long eating habits and increase intake of healthy foods*. Regarding potential barriers, respondents most strongly agreed they *need the support of school administration*. This barrier was closely followed by *need the support of teachers* to implement the policy. *Has a clean and sanitary cafeteria and is safe and secure*

Investigation of the Perceptions of School Professionals Regarding Recess Placement Issues in Elementary Schools

This study examined the perceptions of school professionals (school nutrition directors, school administrators, and teachers) regarding the nutritional, behavioral, and academic impact of recess placement, examining perceptions of barriers to initiating a recess before lunch program, and assessing practices and policies related to successfully implementing a recess before lunch program. In order to investigate the perceptions and practices of school professionals related to recess placement, a two phase research design was employed. In the first phase of the study, eight nationwide focus group discussions were conducted, transcribed, and analyzed for themes. The qualitative data gained from the focus group discussions were then used to develop a

quantitative survey instrument related to recess placement in the second phase of the study. The survey was pilot tested and revised, and the final survey was mailed to a national sample of 2,100 school nutrition directors, principals/assistant principals, and teachers. A total of 332 surveys were returned and used in statistical analysis, for a response rate of 15.8%. The survey instrument used in the second phase of the research project, titled *Issues Related to Recess Placement in Elementary Schools*, consisted of four sections. In the first section of the survey, participants were asked to indicate their level of agreement with a set of 51 statements about the effects of recess schedules in relation to lunch. In the second section of the survey, participants were asked to rate the level of importance of a set of 27 issues when determining how recess should be scheduled in relation to lunch. In the third section of the survey, participants were asked to rate the level of importance of a set of 33 issues in successfully implementing a recess before lunch program. In the fourth section of the survey, participants were asked to provide information about themselves or their schools or school districts. This study identified six categories of potential effects of recess schedule in relation to lunch in elementary schools. These included food consumption, cafeteria behavior, classroom/recess behavior, additional needs, support, and scheduling. School nutrition professionals believed that recess before lunch programs, compared with recess after lunch programs, had more positive impacts on children's food consumption, cafeteria behavior, and recess/classroom behavior. However, participants also identified several potential barriers associated with recess before lunch programs. They believed that recess before lunch programs created additional needs, required more support from all involved parties, and created more scheduling difficulties compared with recess after lunch programs. Thus, the general opinion of participants was that recess before lunch programs were associated with dietary, behavioral, and academic benefits for children, but that there were some additional challenges associated with these programs. This study also identified five categories of issues to consider when determining how recess should be scheduled in relation to lunch in elementary schools. These included personnel support/workload, child feeding implications, logistics, scheduling, and behavior. Participants indicated that child feeding implications was the most important factor to consider when scheduling recess, followed by behavior, scheduling, personnel support/workload, and logistics. The individual items rated as most important to consider when scheduling recess in relation to lunch were maintaining instructional time, children's academic performance, and children's health and well-being. Thus, issues related to what is best for children emerged as most important. Issues important for successfully implementing a recess before lunch program were also identified in this study. Issues rated as most important by participants included having strong leadership for the program, all involved parties working together to establish policy, and maintaining a positive attitude about the program. Additional issues related to scheduling emerged as important, including advance consideration of scheduling issues and being flexible with respect to scheduling. Thus, strong program leadership, inclusive policy making, and scheduling were all considered key factors in successful implementation of recess before lunch programs. School professionals' knowledge and attitudes about recess before lunch programs were also assessed in this study. The majority of participants reported being professionally aware of discussions or information about recess placement issues in elementary schools. However, a third of the participants reported that they were not aware of any research supporting or refuting the benefits of scheduling recess before lunch. Overall, the majority of participants supported scheduling recess before lunch in elementary schools.