

## **School Foodservice Employee Generational Differences and Worked Hours: Impact on Food Safety Practices, Motivations, and Barriers**

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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.*

### **Purpose/Objective**

The purpose of this study was to determine whether nonsupervisory child nutrition employees report differences in perceptions of food safety practices, motivations, and barriers based on age group and number of hours worked.

### **Method**

A valid and reliable questionnaire to a national sample of school foodservice employees was mailed. The questionnaire consisted of four sections: food safety practices, motivations, barriers and demographics. A Likert-type scale was used for practices (5 = always and 1 = never) and barriers/motivators (5 = very important and 1 = not important). SPSS was used for data analysis; descriptive statistics were computed.

### **Results**

A total of 754 employees responded. Four distinct age groups were represented: 18-25 years (1%), 26-40 years (15%), 41-60 years (56%) and over 60 years of age (28%). No significant differences ( $p < .05$ ) were found among the four employee age groups for reported food handling practices and perceived motivators. However, two food safety barrier items, "don't want to waste supplies" and "hand-washing hurts hands" were significantly different ( $p < .05$ ) between age groups; those between the ages 26 to 40 had lower mean ratings ( $M = 3.70$  and  $2.83$ , respectively) compared to those over 41 ( $M = 4.23$  and  $3.48$ , respectively). Also, significant differences in food safety practices, motivators, and barriers were found based on average number hours worked each week. Employees working 10–20 hours had higher mean ratings for "taking temperatures" than those working 21–30 hours ( $M = 4.46$  and  $4.78$ , respectively). Employees working for less than 10 hours rated two motivator items, "supervisor to explain what is expected" and "satisfied customers" higher ( $M = 4.95$  and  $4.98$ , respectively) than employees working 21-30 ( $M = 4.81$  and  $4.90$ , respectively).

### **Applications to Child Nutrition Professionals**

The results of this study show multi-generations working in child nutrition programs perceive food safety aspects differently. Managers should be aware of these differences.

## **A Web-Based Guide For Using School Nutrition Programs As Supervised Practice Sites For Dietetics Students**

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**Purpose/Objective**

The purpose of this project was development of a web-based resource for dietetic educators and school nutrition professionals to provide guidance in the development of supervised practice experiences in local school districts.

**Method**

Information was solicited from dietetic education program directors regarding use of school nutrition programs as supervised practice sites. Examples of assignments, rotation schedules and other pertinent information were collected. Two focus groups were conducted with dietetics students attending a national dietetics conference to explore student knowledge of school nutrition as a career and ascertain learning experiences of interest to students. An expert panel of school nutrition program directors and directors of supervised practice programs in dietetics was convened to discuss development of alliances between schools and dietetic education programs. Materials from the National Food Service Management Institute (NSFMI) and the School Nutrition Association were evaluated for appropriateness in orienting students to school nutrition. Supervised practice experiences and assignments were evaluated, and additional ones were developed. A template was designed to provide consistency in presentation of the material.

**Results**

Thirty-eight assignments, including dietetics and NFSMI competencies, pre-requisite knowledge, references, learning outcomes, and assessment strategies were developed and reviewed by expert panel members and content reviewers. Additional online resources were compiled. Video testimonials about the value of supervised practice experiences in school nutrition were recorded. A dietetics educator, a school nutrition director, and dietetic interns shared their positive school nutrition experiences. The web-based resource may be accessed by students, faculty and school nutrition personnel from the NFSMI website.

**Applications to Child Nutrition Professionals**

This web-based resource is designed to facilitate cooperation between school nutrition programs and dietetic education programs in educating future dietetics professionals who may seek careers in school nutrition. This is critical to alleviate an impending shortage of qualified school nutrition directors and enhance the delivery of food and nutrition services to America's children.

## The Impact Of Healthy Menu Choices On School Nutrition Program

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**Purpose/Objective**

The purpose of this study was to explore the impact of healthy menu choices on school nutrition (SN) programs participating in the National School Lunch Program.

**Method**

Twenty-one SN professionals participated in two expert panel sessions to discuss practices, perceptions, barriers, and training/resources related to providing healthy menu choices in SN programs. The qualitative information from both expert panels was used to develop two surveys, one for SN directors, and an abbreviated survey for SN managers. A national review panel evaluated the content, scales, readability, clarity, and flow of the instruments. Surveys were mailed to a random sample of 700 SN directors and 700 SN managers stratified by USDA regions. Statistical analyses included descriptive statistics, Cronbach's alpha, and one-way ANOVA with Tukey's post hoc test.

**Results**

A total of 267 SN director surveys (38.5%) and 219 SN manager surveys (31.5%) were returned. Results from the study indicated there were 10 factors that contribute to providing healthy menu choices among SN directors which included promotional practices, student benefits, wellness policy practices, partnerships and resources, and positive program environment. Barriers identified by SN directors included increases in food, production and labor costs, recipe development, and students' perception. Additionally, results indicated there were four factors that contribute to providing healthy

menu choices among SN managers which included student focused practices, healthy environment, and operational practices. Barriers identified by SN managers included food, production, and labor costs, knowledge and skill of SN staff to prepare healthy menu choices, as well as SN staff's willingness to change.

#### **Applications to Child Nutrition Professionals**

SN professionals may use this information to assess their school district's local wellness policy, menus, promotional efforts, and nutrition education with the intention of investigating the possibility of attaining the USDA HealthierUS School Challenge award.

## **Development of Middle/Junior High School Student Surveys to Measure Factors that Impact Participation In and Satisfaction with the National School Lunch Program**

**Alexandra Castillo, MPH; Kristi Lofton, PhD, RD**

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#### **Purpose/Objective**

The purpose of this study was to develop and validate two customer service surveys for middle/junior high school students to measure factors that impact their participation in and satisfaction with the National School Lunch Program.

#### **Method**

Qualitative data from the previous National Food Service Management Institute, Applied Research Division (NFSMI, ARD) focus group study and the validated NFSMI, ARD participation and non-participation surveys for high school students were used as the foundation for drafting two middle/junior high school student surveys. A two-stage pilot test was conducted to refine and validate the instruments. Surveys were administered to 1,401 middle/junior high school students from 22 middle/junior high schools (12 school districts) across five USDA regions. Statistical analyses included descriptive statistics, Cronbach's alpha, and one-way ANOVA with Tukey's post hoc test.

#### **Results**

Results from the participation survey and factor analyses showed that middle/junior high school student satisfaction with their school lunch experience can be attributed to two main factors, food preference and staff attentiveness. Top reasons for eating school lunch among participating students were "I am hungry," "I get to sit with my friends," and "I didn't bring anything to eat." Results from the non-participation survey and factor analyses showed that low participation among middle/junior high school students can be attributed to two main factors, food quality and customer service. Top reasons that would encourage students to eat school lunch more often were "better tasting food," "shorter wait in line," and "better quality food."

#### **Applications to Child Nutrition Professionals**

Results from this study will guide the development of a participation and non-participation middle/junior high school student survey guide for school nutrition (SN) professionals. This survey guide will assist SN professionals with planning, administering, collecting, and analyzing middle/junior high school student survey data, and developing and implementing action plans to improve their SN programs.

## **Cooling of Tomato Sauce and Chili in School Foodservice Operations**

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## **The Center of Excellence for Food Safety Research in Child Nutrition Programs; Kansas State University, Manhattan, KS**

### **Purpose/Objective**

The purpose of this study was to analyze the efficacy of various methods used to cool tomato sauce and chili in school foodservice operations.

### **Method**

Cooling treatments included a walk-in cooler, a walk-in freezer, a walk-in cooler with the use of a chill stick, and a walk-in cooler with an ice bath. Tomato sauce (TS) and chili (CI) (prepared using USDA recipes) were placed in pans at two and three-inch depths, or at three gallons in a stock pot when using the chill stick. Temperatures were recorded at one-minute intervals and the average of three replicates were used to establish cooling curves. Based on previous research that suggested uncovered food products cool more rapidly than when covered, all pans remained uncovered during the experiment. Cooling data were analyzed using the Statistical Package for the Social Sciences (v.17.0).

### **Results**

The Food and Drug Administration (FDA) Model Food Code requires food to meet two cooling benchmarks, from 135°F-70°F within the first two hours, and from 135°F-41°F in a total of six hours. Both TS and CI cooled in a walk-in freezer at a both two inch and three inch depths met FDA Food Code benchmarks. None of the treatments in the walk-in refrigerator met either cooling benchmark. Several treatments met one of the benchmarks, but not both. The chill stick treatment required the longest cooling time (TS = 135°F-70°F, M = 4 hours 28 minutes ± 40 minutes; 135°F-41°F, M = 20 hour 28 minutes ± 2 hours 38 minutes; CI = 135°F-70°F, M = 4 hours 41 minutes ± 30 minutes; 135°F-41°F, M = 22 hours 38 minutes ± 2 hours 44 minutes).

### **Applications to Child Nutrition Professionals**

This study demonstrates the need for further research about cooling practices in schools. Best practices for cooling need to be established for foodservice operations, and employee education needs emphasis.

## **The Impact of Non-Offer vs. Serve on Kindergarten and First Grade Students' Behaviors and Food Selections**

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### **Purpose/Objective**

To assess the short-term and long-term impacts of removing Kindergarten and first-grade students from the Offer vs. Serve provision.

### **Method**

A retrospective, qualitative study using focus group methodology was used. Eleven Food and Nutrition Services Managers and four Area Supervisors participated in the focus groups.

Three themes were identified as a result of the focus group exploration: 1.) K-1 students' behaviors and food selections before removal from OVS, 2.) K-1 students' behaviors and food selections after removal from OVS, and 3.) effects of OVS removal on students in grades 2-7 (a K-1 non-OVS menu was introduced in 2005-2006).

Before introduction of the non-OVS K-1 menu, the majority of young students selected a 3 or 4 meal component lunch. Students were often observed to be confused or unfamiliar with foods being offered, and had difficulty making food selections.

Although FNS Managers, teachers, and school administrators were initially skeptical when the K-1 non-OVS menu was introduced, the positive impacts of the menu became readily apparent, including: 1.) five meal components on all K-1 trays, 2.) students observed trying new food items previously avoided, 3.) positive peer influence, 4.) eventual teacher and FNS staff buy-in, 5.) parent acceptance and appreciation (they verbalized that they were "getting their money's worth").

## **Results**

The longer term effects of children currently in grades 2 through 7 who were removed from OVS during their K-1 years include 1.) Sustained increases in vegetable, fruit, and salad selections, 2.) Student focus not only on the entrees, but also on available fruits and vegetables, 3.) Greater acceptance of salad bars and entree salads, 4.) Greater familiarity with a variety of food items, 5.) A dramatic increase in 4- and 5-component meals in 2nd through 7th grade students.

## **Applications to Child Nutrition Professionals**

The K-1 non-OVS menu reinforces healthy food-related behaviors and food selections. A much greater familiarity with fruits and vegetables, specifically, has resulted in overall increases in fresh produce selection and consumption among elementary aged students. The Fresh Fruit and Vegetable program ties in nicely with the non-OVS menu, as students are already acquainted with a variety of foods, and are not reluctant to try new foods.

The positive reinforcement offered by FNS managers, student peers, and older students has resulted in sustained fruit and vegetable consumption. With the introduction of a new USDA meal pattern in 2012-2013, Sarasota County Schools' Food and Nutrition Services program is prepared to not only meet the requirements, but to provide a well-balanced program to students who are well acquainted with healthy foods, and accustomed to making healthy meal choices.

## **Plate Waste and Lunch Program Experience Among School Lunch Program Participants at Two High Schools**

**Jessica Haas**

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### **Purpose/Objective**

The purpose of this study was to determine: 1) What foods high school students participating in the school lunch program are wasting the most of; 2) How much of these foods they are wasting; and 3) What are their perceptions towards school lunch.

### **Method**

Researchers measured plate waste at two Colorado high schools using a previously validated digital photography method. Additionally, students completed a 19-item, multiple-choice lunch program experience survey. Statistical analysis included descriptive statistics and analysis of variance.

### **Results**

Plate waste data were collected from a total of 317 students (39% of lunch program participants), and included 53.3% males and 75% underclassmen. Overall, average plate waste was 19%, with vegetables having the highest average waste (28%). However, the majority of students had = 10% waste in each food category. Significant gender differences existed in waste percentage of entrée, total fruit, canned fruit, and other, with females wasting more of each food group. Surveys were completed by 127 students (46.5% males, 3.1% missing gender). About half of the students agree or feel neutral that school lunches are healthful, taste good, and make them full, and almost 40% of students agree or feel neutral that school lunches provide enough variety. When deciding what to select for lunch from the school cafeteria, students indicated good taste is important, whereas the nutritional content of food is not as important.

### **Applications to Child Nutrition Professionals**

Understanding students' school lunch choices and consumption patterns provides goals for intervention development and a baseline for evaluation in improving school lunch choices. Additionally, a more accurate understanding of student attitudes toward school lunch will give school nutrition professionals a foundation from which to design more attractive, healthful meals as perceived by students.

## **Health Inspection Violations in School Foodservice Operations**

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**The Center of Excellence for Food Safety Research in Child Nutrition Programs; Kansas State University, Manhattan, KS**

#### **Purpose/Objective**

The purpose of this research was to assess health inspection violations in school foodservice operations across the United States in order to understand areas that are successfully implemented and areas that need improvement.

#### **Method**

Three states from each of USDA's seven regions (n = 21) were randomly identified to participate in the study. The state or local health department responsible for health inspections was contacted and a request was made to receive the most recent inspection report for each school in the state. This information was available online for seven states and 14 states mailed their inspection reports directly to the researchers. Researchers coded each state based on their inspection form. Inspection forms were then compared across states to categorize the data for comparison purposes. A total of 31 categories were identified. Data were collapsed into as many categories as possible to retain the integrity of the data.

#### **Results**

A total of 28,106 school inspection reports were analyzed, representing 46,389 total violations. The most common inspection violation among schools was related to the cleanliness of the premises (walls, floors, ceilings) and equipment (8,915 violations; 31.7%). The second most common violation was related to cleanliness of other non-food contact surfaces such as gasket seals on refrigeration and freezer units or microwave cabinets (3,230; 11.5%), followed by food protected from contamination (3,129; 11.1%), and time/temperature requirements (2,243; 8.0%). The least common inspection violations were related to reheating (63; 0.2%), cooking (70; 0.2%), and thawing (174; 0.6%).

#### **Applications to Child Nutrition Professionals**

The data from this study helps researchers and operators determine appropriate and improvable practices in school foodservice operations. These data also allows directors and supervisors to benchmark their operations to a larger national sample and can be utilized to build educational programs for directors, managers, and employees.

## **Sustainability of School Wellness Policy Initiatives**

**Jane M. Osowski, PhD, RD; Mary Frances Nettles, PhD, RD**  
**National Food Service Management Institute, Hattiesburg, MS**

#### **Purpose/Objective**

The purpose of this study was to explore strategies for sustaining school wellness as well as monitoring/evaluation practices used for measuring progress.

#### **Method**

Eight school nutrition (SN) professionals participated in an expert panel session to discuss strategies used to sustain Local Wellness Policy (LWP) initiatives and monitoring/evaluation practices. Qualitative information from the expert panel was used to develop a survey which was mailed to a random sample of 700 SN directors stratified by USDA region.

#### **Results**

A total of 225 surveys (32%) were returned. Respondents reported that LWP programs/activities were communicated to teachers (56.5%), administration staff (52.7%), and students (51.6%). LWP accomplishments were reported to school boards (50.9%) and LWP obstacles were communicated to school administration staff (51.8%). SN directors reported sole leadership in the implementation of school meal assurances (91.9%) and the guidelines for competitive foods sold (57.2%). Other school staff or community members who have leadership roles in implementing LWP components included the district school nurse (51.4%); school administrative staff, such as principals (46.8%); district-level wellness committee (45.5%); and district administration staff (42.8%). Respondents indicated that the LWP components most often monitored at the district level were SN program related. The majority of the respondents (ranging from 42.4 – 46.5%) indicated that they did not know how often the LWP monitoring data were collected, who reviewed the results from monitoring

LWP activities, who analyzed the results and how the results were used at the district level. Respondents reported that sustainability of the LWP initiatives involved maintaining a wellness committee at the school district level (69.0%).

#### **Applications to Child Nutrition Professionals**

Continued leadership, communication with stakeholders, and technical assistance are critical to LWP progress and sustainability as districts may not be prepared to monitor LWP implementation. Information gained from this study will be used to guide the development of a resource for monitoring/evaluating LWP objectives and activities at the district and school site levels.

## **Job Functions and Training Needs of State Agency Child Nutrition Professionals**

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National Food Service Management Institute, Hattiesburg, MS**

#### **Purpose/Objectives**

The objectives were to identify job functions, job responsibilities training needs, and training preferences of child nutrition (CN) professionals working in state agencies.

#### **Method**

In Phase I, an expert panel of state agency CN professionals participated in a modified Delphi process to identify the functional areas encompassing the job responsibilities of state agency CN professionals. During a work group session the expert panel agreed on the responsibilities needed by state agency CN professionals, sorted the responsibilities into the appropriate functional areas, and discussed training needs and preferences. In Phase II, a nationwide review panel completed an electronic survey to verify the competencies and training needs and preferences developed by the expert panel.

#### **Results**

Six functional areas encompassing the job responsibilities of state agency child nutrition professionals were identified: financial management; personnel management; program and regulatory compliance; program management; technology and data management; and training, technical assistance, and outreach. Definitions were developed for each functional area and 39 job responsibilities related to the functional areas were identified and confirmed. USDA/FNS training and resources and on-the-job training are relied upon most by state agency CN professionals. Consistent interpretation of USDA guidance and regulations across all states was the most desired element in training and continuing education.

#### **Applications to Child Nutrition Professionals**

The functional areas, job responsibilities, and training needs and preferences identified in this project provide a picture of the role of CN professionals at the state level. Administrators can use this information to prepare job descriptions and evaluation criteria for state agency CN staff. These findings also can provide the basis for mentoring and other succession planning activities to prepare CN professionals for state-level responsibilities.

## **Determining Common Vocabulary for Evaluation of Objectives and Activities in Local Wellness Policies (LWP): Pre-meeting Activity for an Expert Panel**

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National Food Service Management Institute, Hattiesburg, MS**

#### **Purpose/Objective**

Use pre-meeting activity to prepare expert panel members for a face-to-face meeting on characteristics of a successful resource to sustain and strengthen Local Wellness Policy/Policies (LWP) objectives/activities.

## **Method**

A pre-meeting activity on developing and implementing evaluation measures for a sample LWP activity was created to gauge familiarity with the evaluation process and to develop a common vocabulary to describe types of measures: process, outcome, and impact. Participants were asked to consider several components of the evaluation measure: what to measure, how to make measurements, how to analyze what is measured, what standards were used, and the type of measurement (process, outcome, and impact). They were given specific definitions for “process measure,” “outcome measure,” and “impact measure” to guide deliberation. Activity responses served as the springboard for panel discussions.

## **Results**

Participants independently outlined 26 different possible measures for the sample activity. While they were able to describe how to make the measures, panelists found it more difficult to describe how to analyze the measures or compare them to standards. Panelists reported that the activity helped them to orient the evaluation discussion toward development of a resource for measurement of LWP objectives and activities and that the common vocabulary helped to anchor the evaluation process: “The focus on process is reflective of the level of maturity of our evaluation. We need to grow into documenting outcomes and impacts.” The panel also recognized that strong evaluation requires time: “When you measure change, the transition between outcome and impact is important; you have to be in it for the long haul and be committed.”

## **Applications to Child Nutrition Professionals**

Themes from the discussion, including the focus on types of measures that can be used over time and methods for analyzing and reporting data for evaluation of LWP activities by districts and school sites, will be used to develop an evaluation resource.

# **Food Offering and Children’s Perspective of Healthy Food in A La Carte School Settings: An International Experience**

**Paola Paez, PhD; Marianela Zuñiga**

**University of Costa Rica, San Jose**

## **Purpose/Objective**

The purpose of this study was to identify children’s perspectives of healthy food that should be offered in the a la carte school settings in comparison to what is offered.

## **Method**

Third and fourth graders of three Costa Rican schools were interviewed (N = 218) using a structured questionnaire. The questionnaire had three sections; a demographic section; section two included items to gather information about the a la carte setting; and section three included items to assess children’s perspective of a healthy a la carte school setting. Food offerings were determined using observations. Responses were analyzed using descriptive statistics, including frequencies, means, and standard deviations.

## **Results**

The three a la carte school settings had a variety of food that could be purchased during recess and lunch time. Food included: snacks; deep fried products prepared at school; and drinks with high content of sugar; only one of the settings had fruits as an option. Kids expressed a healthy a la carte school setting should include good service but the most important consideration should be the type of food offered. Most of the kids (96%) considered fruits and vegetables as the healthier type of food and agreed to buy them if they were offered; even though observations showed the purchase of fruit and vegetables was limited.

## **Applications to Child Nutrition Professionals**

Children worldwide consume a large portion of their daily food intake at schools. This work presents information about kids’ perspectives of healthy food items that should be offered in a la carte settings. This information can help school foodservice authorities in making decisions about the type of food that can be included in a la carte settings, considering kids’ preferences, and at the same time influencing in a positive way the diet of children and adolescents which can help prevent child obesity. Future studies in a la carte settings could determine kids’ selection behaviors.



## Effectiveness of In-Classroom Breakfast in Five Exemplary Districts

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### **Purpose/Objective**

A national trend to improve school breakfast participation is the integration of breakfast within the school day. In-classroom breakfast programs dramatically increase student access to school breakfast. Service models include “grab and go,” distribution of breakfasts to each classroom, and mobile breakfast carts in hallways. The purpose of this study was to determine the effectiveness of in-classroom breakfast using financial records, menus, and student outcomes.

### **Method**

Using case study research methodology, the National Food Service Management Institute Applied Research Division conducted a study to determine effectiveness of in-classroom breakfast. State agencies recommended exemplary districts offering in-classroom breakfast programs. After a pilot visit to a Midwest USDA Region district, four districts of varying sizes in the Mid-Atlantic, Northeast, Western, and Mountain Plains USDA Regions were visited. Preparation, distribution, and service of breakfast were observed in elementary, middle, and high schools. School nutrition directors, principals, teachers, and other school personnel were interviewed.

### **Results**

Schools that offer in-classroom breakfast have experienced dramatic increases in participation which leads to increased revenue. A high school that served 50 breakfasts per day increased participation to 950 breakfasts per day. A K–8 elementary school with in-classroom breakfast earned \$70,412 yearly in excess revenue compared to a similar school that did not offer it (\$29,813). A middle school that began in-classroom breakfast in 2011 experienced a drop in disciplinary referrals from 377 to 171 from 2010 to 2011. When ranking menu-planning considerations, directors highly ranked nutritive value, packaging, and student preferences.

### **Applications to Child Nutrition Professionals**

Increased breakfast participation leads to improved nutrition for children, and can be financially rewarding for districts. In-classroom breakfast can improve school culture and have a positive effect on student behavior. The outcomes of this study should be shared with school nutrition personnel, school administrators, teachers, school staff, and parents.

## An Observational Study of Glove Use Behaviors among College and University Dining Foodservice Workers

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**Iowa State University, Ames, Iowa**

### **Purpose/Objective**

The purpose of this study was to observe glove use behaviors among line level staff in one segment of retail foodservice and assess the effectiveness of a behavior change intervention to improve glove use behaviors.

### **Method**

There is potential that foodborne illness may occur due to improper hand hygiene, including incorrect use of gloves, thus an intervention to improve proper behaviors was introduced in one onsite segment of retail foodservices, college and university dining. The intervention consisted of a 10 minute training session that covered proper hand washing and glove use using ISU Yuck photos and a developed flyer. The flyer entitled “I’m Gloving It: The Why, The Where and The How!” provided information about glove use in accordance with the 2005 Food Code guidelines. The flyer used visuals to convey the message of proper glove use and a brief rationale to address proper glove use. A total of 64 hours of observational data was collected. Behavior change among 32 hourly food

handlers was tracked and compared with those not part of the treatment group to assess the effectiveness of the glove use campaign. Data was analyzed using SPSS 20.0, and descriptive statistics were calculated.

### **Results**

Glove-use behaviors significantly improved among food handlers that received the intervention. Non-compliance behaviors among participants that did not receive any training were 66%, while non-compliance behaviors among those participants that received training were 23%.

### **Applications to Child Nutrition Professionals**

School foodservice staff can use minimal-text visuals based on social marketing principles to train and reinforce proper hand hygiene behaviors. With increasing diversity in the workforce, use of such education materials may help improve food safety.

## **Food Choice, Plate Waste, and Nutrient Intake of Elementary and Middle School Students Participating in the National School Lunch Program**

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**Colorado State University, Fort Collins, Colorado**

### **Purpose/Objective**

The purpose of this study was to: 1) evaluate consumption patterns and food choices of K-8 students who participated in the National School Lunch Program (NSLP) and, 2) compare students' average nutrient intake from lunch to the 2010 and new USDA school lunch standards.

### **Method**

Students from 3 elementary (K–5) and 2 middle (6–8) schools in one northern Colorado school district participated in this study in the fall of 2010. Plate waste was measured using a previously validated digital photography method. Percent waste was estimated to the nearest 10%, for the entrée, canned fruit, fresh fruit, vegetable, grain, and milk. Univariate ANOVA was conducted to determine differences in percent waste between schools, grades, and genders. Daily nutrient intake was calculated using the district's menu analysis and percent waste.

### **Results**

Plate waste was estimated from 899 student lunch trays; 535 elementary and 364 middle school students. Less than 56% of elementary and 39% of middle school students took fresh fruit with lunch. Only 45% of elementary and 34% middle school students selected a vegetable. Elementary students wasted more than a third of grain, fruit, and vegetable menu items. Middle school students left nearly 50% of fresh fruit, 37% of canned fruit and nearly a third of vegetables unconsumed. Less than half of students met 2010 NSLP lunch recommendations for vitamin A, vitamin C, or iron. Even fewer met 2012 targets.

### **Applications to Child Nutrition Professionals**

The key finding from this study was that few students' lunch consumption met 2010 NSLP meal guidelines or the new meal standards. Due to the relatively low intake of fruits and vegetables, intake of vitamins A and C were of particular concern. New strategies, involving multiple stakeholders, will be necessary to improve students' food choices when the new lunch patterns are fully implemented.

## **A Training and Education Needs Assessment of Child Nutrition Personnel in Programs that Sponsor the National School Lunch Program in California**

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### **Purpose/Objective**

The objective of this study was to determine the perceived training, education, professional development, and resource needs of personnel employed in California by programs (schools, residential child care institutions (RCCIs), and after school programs) participating in the National School Lunch Program (NSLP). This study was conducted to assist the California Department of Education (CDE) Nutrition Services Division (NSD) in developing a five-year plan that directs limited funds and staff resources towards the trainings and resources child nutrition personnel need.

### **Method**

A questionnaire was developed using items from similar previous surveys. New items were written based on feedback from the Training and Education Needs Assessment (TENA) committee, a stakeholder group convened by the NSD, as well as NSD staff. The questionnaire was reviewed for content validity by nutrition and education experts at the Center for Nutrition in Schools, TENA committee members, and NSD staff. Respondents were asked to rate their perceived need for each training topic on a Likert scale ranging from not part of my job to really needed. Respondents rated usefulness of resources on a scale of not helpful to really helpful. Questions were also included to ascertain preferences for training format, length, and location. Survey dissemination followed Dillman's tailored design method and included a series of emails sent to programs participating in the NSLP (n = 1490) over the course of several weeks. Each point of contact included a link to a web-based questionnaire. An option to complete a paper copy of the questionnaire was also available.

### **Results**

A total of 998 surveys were initiated and 873 were completed by multiple levels of personnel. Respondents indicated a need for training in topics related to program management, the new meal pattern, nutrition, health, and wellness. Those employed in RCCIs expressed a strong need for training specific to RCCIs. All resources suggested on the questionnaire were considered really helpful by respondents, however the most helpful resources were "standardized recipes aligned with new meal pattern" and "online directory of available trainings." The majority of respondents preferred one to three hours long, in-person trainings within sixty miles from them. However a very high proportion of respondents were willing to participate in Internet-based training.

### **Applications to Child Nutrition Professionals**

The survey illuminates the perceived needs and preferences of child nutrition program directors, managers, and staff in California. It provides valuable information in guiding the development of training courses and the overall plan for providing trainings and resources, as the CDE supports the NSLP sponsors in implementing the numerous changes to the NSLP and the School Breakfast Program mandated through the Healthy, Hunger-Free Kids Act of 2010. Other states may consider these findings in developing training plans, or use this study as a model in conducting their own needs assessment.

## **Foodservice Directors' and School Business Officials' Perceptions**

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**Upper Moreland Township School District, Willow Grove, PA**

### **Purpose/Objective**

To assess perceptions of foodservice directors (FSDs) and school business officials (SBOs) in USDA MARO Region about food safety policies at board-level.

### **Method**

As part of a larger study investigating school administrators' knowledge about the HACCP requirement in public districts with enrollments between 2,500 and 25,000 (N = 498), a mail survey included questions about the existence (Yes/No) and perceived importance of 8 listed board-level

polices related to food safety (5 = Very Important), and identification of factors that positively influenced district food safety support.

### **Results**

Of the 124 FSD respondents, 65 indicated existence of district board-level food safety policy and 96 had a policy about kitchen use for non-CNP activities. Of the 91 SBO respondents, 47 indicated a district board-level food safety policy (51.7%) and 58 identified specific kitchen policy use for outside groups. Few FSDs indicated board-level policy required food safety training of all district staff (2.4%) or volunteers (8.4%); about 14% of SBOs noted these polices existed. FSDs and SBOs rated highly the importance of a district food safety policy (FSDs M = 4.37; SBOs M = 4.17). Positive influencers noted by FSDs and SBOs for district support for food safety efforts were State/federal mandates (FSDs 83.7%; SBOs 84.6%), corrective action in CRE/SMI audit (FSDs 50.0 %; SBOs 47.3%), and district board policy (FSDs 48.2%; SBOs 57.1%).

### **Applications to Child Nutrition Professionals**

School district staff and volunteers may be involved in food preparation and/or service of foods. Children are considered at risk of contracting a foodborne illness; foods served during the school day could be considered the districts' responsibility, thus increasing liability and exposure. District board-level food safety policies guide school workers and volunteers, and demonstrate commitment to promoting a healthy school environment. Findings from this study indicated regulations and funding restrictions are perceived as change agents.

## **Dietetic Supervised Practice: Win-Win for School Nutrition Programs**

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**Kansas State University, Manhattan, Kansas**

### **Purpose/Objective**

The purpose of this study was to identify the prevalence of use of school nutrition (SN) sites in supervised practice programs. Objectives included identifying the benefits and challenges of working with SN programs, examples of assignments completed by dietetic students/interns, and resources needed for successful implementation of these cooperative ventures.

### **Method**

Electronic surveys were distributed to the entire population of 243 dietetic internship (DI) directors and 53 coordinated program (CP) directors. Ninety-one percent of DI programs and 96% of CPs used SN sites for supervised practice. The school sites used most often include individual schools (70% DI, 90% CP), followed by school district offices (64% DI, 60% CP). The SN program director was the initial contact for establishment of the affiliation by 65% of the DI and 80% of the CP respondents.

### **Results**

Introducing dietetics students/interns to SN as a career option was cited most often as a benefit of the SN experience. Finding qualified preceptors was identified most often as a challenge. Resources that are needed to assist educators in developing experiences include scenarios that apply dietetic competencies to SN settings, templates of affiliation agreements, and methods of identifying SN preceptors. SN supervised practice experiences provide exposure to another facet of the dietetic profession for future dietetics professionals.

### **Applications to Child Nutrition Professionals**

Working with dietetic students in supervised practice can be a win-win situation for SN directors and dietetic educators. Student dietitians are exposed to the complexity and the demands of the SN profession as well as the rewards for working with this facet of a career in foodservice and nutrition. Preceptors are not required to be a Registered Dietitian. SN professionals interested in serving as preceptors for dietetic supervised practice may contact dietetic programs in their area or explore distance dietetic education programs