

2005 Child Nutrition Showcase Abstracts

Healthy Schools Program in Malaysia – Improvements in Nutrition Knowledge and Dietary Practices Among Primary School Children

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Purpose/Objective

The Healthy Schools Campaign was initiated to promote healthy eating and active lifestyles among school children seven- to twelve-years-old. This study shows the impact that nutrition education has on the nourishment and dietary practices of school children.

Method

A major component of the Healthy Schools Campaign is the nutrition education program. School teachers are trained to be familiar with the nutrition modules before classroom teaching commences. A total of 786 children were evaluated during pre-intervention, and 637 children were reevaluated during post-intervention, corresponding to a response rate of 81%. A set of questionnaires on nutrition knowledge and practices were used. Younger children, seven- to nine-years-old, were interviewed on a one-to-one basis, while older children, 10- to 12-year-olds, were interviewed in small groups of one to five participants.

Results

The nutrition knowledge of the children surveyed improved significantly ($p < 0.05$) from pre- to post-intervention. Average marks obtained in the post-intervention were 70% ($\pm 21\%$), as compared to 65% ($\pm 20\%$) during pre-intervention. More children were aware of the importance of breakfast and 58% agreed that breakfast was essential, not just to curb hunger, but to improve their health. Although the percentage of children consuming breakfast daily dropped from 80% to 75% during the intervention period, the food habits of students overall improved to include a reduction in snacking, as well as fast food consumption. Beverage choice also improved and healthier options, such as plain water and chocolate-flavored malt drinks, were chosen more often than cordial and carbonated beverages. Overall, as a result of the intervention, the children in the survey succeeded in improving their nutrition knowledge and certain dietary practices.

Application

A majority of the school teachers involved gave positive feedback on the implementation of the nutrition education modules used through the Healthy Schools Campaign. Child nutrition professionals may adopt or adapt the nutrition education modules for implementation in their schools.

At School and Away-from-School Food Intake of Middle School Students

Mary Kay Meyer, PhD, RD, NFSMI Applied Research Division, University of Southern Mississippi, Hattiesburg, MS.

Purpose/Objective

The objective of this study was to determine the food intake of middle school students in school, as well as away from school.

Method

A three-day food diary was used to gather food intake from Sixth- and Eighth-Grade students attending four schools in Colorado, Mississippi, and Texas (n=259). Using servings as the basic unit of consumption, a Food Guide Pyramid (FGP) score was developed. Each FGP score ranged between zero and ten, with 0=none and 10=recommended or more servings from a food group. Scores were assigned proportionally according to the consumption rate. The maximum total FGP score was identified as 50. The fats and sweets score equaled the total servings consumed in that group.

Results

Compared with a recommended score of ten, the mean FGP scores were 5.8 for bread, 6.7 for milk, 8.7 for meat, 3.1 for vegetables, and 3.0 for fruit. The mean total FGP score was 27.3, as compared with a maximum of 50. The fats and sweets minimum consumption was zero, with a maximum of 12 and mean of 2.2. No difference between gender, grade, or ethnicity was found for the total FGP score. The proportion of daily intake at school averaged 36% for bread, 38% for milk, 34% for meat, 49% for fruit, and 41% for vegetables. However, only 23% of servings from the fats and sweets group were consumed at school. Results of this study show that students are not consuming the recommended number of servings from the FGP groups. However, at school, students are consuming a greater percentage of servings from the fruit and vegetable groups than other food groups. Additionally, students are consuming a larger proportion of fats and sweets away from school than at school.

Application

Parents are encouraged to assume more responsibility for the eating habits and health of their children. School administrators, parents, health professionals, and community leaders are encouraged to investigate the important role school meals play in the health and wellness of students, and work together to develop school wellness programs.

Development of a Parent Foodservice Survey for Young Children

Mary Kay Meyer, PhD, RD; and Deborah Carr, PhD, RD, NFSMI Applied Research Division, University of Southern Mississippi, Hattiesburg, MS.

Purpose/Objective

The nutrient contribution of foods served and chosen by children in childcare settings have a substantial impact on the overall quality of their diets. The purpose of this study was to develop a survey for parents of children participating in the Child and Adult Care Food Program (CACFP) to assess meal and mealtime characteristics.

Method

Three focus groups of between five and twelve participants were held in southeast and northeast locations to guide question development. Based on focus group results, review of literature, and researchers' experience, 40 questions were developed. The survey was distributed to 300 parents

in ten Head Start and daycare centers nationwide. A return rate of 53% was received. The construct of the survey was developed on SPSS (Version 12.0 for Windows) using principal component factor analysis with a varimax rotation and eigen-values above 1.0.

Results

Factor analysis developed five factors accounting for 78.4% of the variance. One factor was global in nature and, therefore, was not included in the final model. The final model was composed of 20 of the original 40 questions. The factors with alpha scores are meals (0.91), information (0.84), preparation for meals (0.91), and nutrition (0.87). Parents provided information about the meals served and, as a result, the model had a high rate of reliability, which shows that parents are concerned that their children eat healthful foods in a pleasant, encouraging environment.

Application

Although research indicates that young children, overall, are likely to meet their nutrient needs, parents continue to express concern about their children's dietary habits. This study reinforces that parents are troubled by the meals their children consume in the daycare setting. The survey will be available for use by CACFP participants within the year.

Changes in Child Nutrition Programs: Perspectives from Oral Histories

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Purpose/Objective

As part of the Child Nutrition Archives' ongoing oral history project, the authors asked child nutrition program (CNP) professionals their opinions concerning how CNPs have changed over the years. Interview responses from CNP professionals at the local, state, and national level and in different regions of the country were collected to chronicle the program changes experienced over the years and record participant perspectives on evolving regulations and guidelines.

Method

For this project the authors interviewed individuals from different regions of the country who are or have worked in CNPs at various levels of involvement. The interviews were video- and/or audiotaped. The authors then transcribed the responses to the questions.

Results

To date, the responses of more than 30 participants have been recorded. The answers to the questions depended on the respondent's age, job responsibilities, location, and professional involvement. Each person's story was unique. The respondents discussed equipment, menu, and labor changes; the changing customer; and other topics. The interviews are available at the Child Nutrition Archives Web site, <http://www.nfsmi.org>, and also onsite at the National Food Service Management Institute.

Application

The collected information documents the changes in CNPs over the years and will assist researchers in understanding the programs' evolution, as well as the perceptions of those changes

within the profession. Having access to individual perspectives provides different opinions for those administering and formulating current and future program changes to consider.

Two-year Surveillance of the USDA Fruit and Vegetable Pilot in Indiana

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Purpose/Objective

The benefits of increasing the intake of fruits and vegetables are well documented, however, children remain below recommended levels of consumption. This study was conducted to document the impact of the Fruit and Vegetable Pilot Program, funded by the U.S. Department of Agriculture (USDA) on student intake over time.

Method

For two years, 25 schools participated in programs to offer fresh fruits and vegetables throughout the school day for two years. An anonymous questionnaire was administered to Fourth- through Six-gGraders and Ninth- through Twelfth-graders before the intervention began (Fall 2002), six months after initiation (Spring 2003), after summer break (Fall 2003), and during Year 2 (Spring 2004) to evaluate the program's effect on students' intake of fruits, vegetables, and low-nutrient dense foods. Analyses were restricted to data from the ten schools that participated in all four surveys. Data were analyzed by grade using ANOVA, followed by post-hoc testing.

Results

Fruit and vegetable intake improved from Fall 2002 to Spring 2003, although the mean consumption rate varied by grade. Total intake decreased for most grades after summer break. During Year 2 of the program, intake increased, even though the vegetable consumption rate was not as large as in Year 1. For most grades, candy intake decreased during Year 1, fell even further during the summer, then increased during Year 2. There were no changes in the consumption rate of fries and chips during the intervention period.

Application

This study may offer operators of school foodservice programs insight into different school environments that would maximize fruit and vegetable intake, while lowering the consumption of low-nutrient density foods.

Nutrition, Physical Activity, and Perceptions of Weight Status Among Middle School Children

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Purpose/Objective

The purpose of this study was to assess middle school children's nutrition and physical activity behaviors, and their perceived weight.

Method

The survey consisted of questions taken from the School Physical Activity and Nutrition (SPAN)

project questionnaire. Survey questions addressed students' dietary practices, weight-related attitudes and behaviors, and physical activity practices. Surveys were administered to six Fifth- and Sixth-grade classes in a suburban school district. A total of 245 students participated in the study; 112 participants were female and 129 were male. Students were asked about what they had eaten and how they had exercised the day before.

Results

Results indicate that 40% had not consumed fruit and 29% had not eaten vegetables the day before. Almost 65% of students had consumed at least one soda the previous day and 58.8% indicated they had consumed "punch." When asked about their perception of their weight compared to others in their grade, 23% percent reported that they thought they weighed too much. When asked if they had ever tried to lose weight, 45% of students indicated that they had, and 31% reported that they were presently trying to lose weight. The majority of students indicated that they had watched television (78%) and played video games (80%) the day before. More than half (55%) reported that they did not take part in any organized physical activity.

Application

Information on middle school students' nutrition, physical activity behaviors, and attitudes related to weight are needed to better address the implementation of wellness policies in school settings. Local education agencies are advised to incorporate research-based findings, as they develop wellness policies that positively influence the school environment.

Perceptions, Practices, and Barriers of Mississippi School Foodservice Directors to Providing Nutrition Education to Elementary School Students

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Purpose/Objective

The purpose of this research was to identify perceptions, practices, and barriers that Mississippi school foodservice directors experience in supporting nutrition education for elementary school students.

Method

The survey instrument, Nutrition Education Practices Survey, developed by Drs. Laurel Lambert and Deborah Carr, was slightly modified for this study. The survey contained demographic questions and 29 statements to which respondents indicated their level of agreement, using a sliding scale. These statements were designed to measure practices, perceptions, and barriers to providing nutrition education to elementary school students.

Results

Of the 75 directors who were mailed surveys, 42 (56%) responded. Cumulative frequencies and factor analysis were used for data analyses. Sixty-seven percent of directors had a four-year college degree or higher and 48% had more than ten years experience in elementary school systems. Thirty percent reported providing no nutrition education during the school year, while 31% provided one to ten hours and 24% provided less than one hour. The top three nutrition

education resources used by directors were materials from school lunch menus (77%), the Dairy Council (70%), and Team Nutrition Scholastics. Directors reported that they received training on how to provide nutrition education through university nutrition courses (55%) and nutrition education seminars (55%). The majority of directors (98%) agreed that nutrition education should be a part of the elementary school curriculum and 60% agreed that it was their role to provide such education.

Application

For nutrition education to be successful in a school setting, it has to be implemented in an environment that fosters a team approach involving all stakeholders, including teachers, foodservice directors, school administrators, parents, and students. Local education agencies are advised to involve the school foodservice director as a partner in the development and implementation of the local wellness plan in order to maximize the teaching and supporting of nutrition education to elementary students.

Elementary School Teachers and Principals Identify Their Practices, Perceptions, and Barriers to Providing Nutrition Education to Students

Deborah H. Carr, PhD, RD; and Laurel G. Lambert, PhD, RD, NFSMI Applied Research Division, University of Southern Mississippi, Hattiesburg, MS.

Purpose/Objective

School districts participating in the National School Lunch Program (NSLP) are required to have, by July 1, 2006, local wellness policies that include nutrition education goals. The purpose of this research was to identify existing practices, perceptions, and barriers that elementary school teachers and principals have when providing nutrition education.

Method

The survey instrument, Nutrition Education Practices Survey (NEPS), was developed and mailed to 926 teachers and 140 principals in 140 randomly selected elementary schools in Arkansas and Idaho. The survey obtained demographics and level of agreement with 28 statements regarding the provision of nutrition education. Data analyses included cumulative frequencies and factor analysis.

Results

Teachers (71%) and principals (90%) agreed that nutrition education is part of their curriculum. Less than half (43%) of principals agreed that teachers have adequate training to provide nutrition education, which differed significantly from teachers (73%) who agreed they have adequate training. Teachers (56%) and principals (71%) agreed that menu items served in the NSLP reinforced nutrition education provided in the classroom. Twenty-six percent of teachers and 53% of principals agreed that adequate funds are allocated to support nutrition education.

Application

For nutrition education to be successful in local wellness policies, it must be implemented in an environment that fosters a team approach that involves all stakeholders, including teachers, principals, school nutrition professionals, parents, and students. It is important that state curriculum standards emphasize nutrition education and its incorporation into the classroom.

Additionally, teachers should have access and be encouraged to obtain nutrition education training when needed. For nutrition education to attain its full potential, the perception by teachers that NSLP menus reinforce classroom instruction should be improved. In this climate of wellness promotion, it is advised that funding for nutrition education be reviewed to ensure that adequate resources are available to meet nutrition education goals.

Consumption of Sweetened Beverages Negatively Impacts Lunch Nutrient and Food Group Intake

Karen W. Cullen, PhD; and Kathy Watson, Children's Nutrition Research Center, Baylor College of Medicine, Houston, TX.

Purpose/Objective

National School Lunch Program (NSLP) meals provide an important source of fruit, vegetables, and milk for students. Although schools often sell sweetened beverages, the impact of beverage availability on student drink consumption during school lunch is not known. This study assessed the impact of drinking sweetened beverages on nutrient and food group consumption by middle school students.

Method

Sixth- through Eighth-grade students from three schools participated in the study, for a total of 2,790 students, 48% of whom qualified for free or reduced price lunches. Sixty-one percent of the study population were Hispanic, 34% were white, 3% were African-American, and 2% were Asian or "other." During one school year, assenting students completed anonymous lunch food records (n=2677) in the cafeteria immediately after eating. The lunch records were entered into Nutrient Data Systems (Version 4.2; University of Minnesota) to obtain nutrient and food group intake. Consumption of fruit, vegetables, milk, calories, and various nutrients were calculated and compared between students who did or did not drink a sweetened beverage for lunch.

Results

Average daily lunch consumption was 0.31 servings of fruit, 0.31 servings of non-fried vegetables, 3 ounces of milk, and 5.4 ounces of a sweetened beverage. Food consumed averaged 624 total calories, of which 37% and 13% of calories came from fat and saturated fat, respectively. Compared with students who consumed a sweetened beverage at lunch, students who did not consume such a beverage reported eating greater amounts of fruit (0.45 servings compared to 0.11 serving), non-fried vegetables (0.39 serving compared to 0.21 serving), milk (4.1 ounces compared to 0.29 ounces), and most nutrients. Caloric intake did not differ between groups. Percent of calories from fat and saturated fat were significantly higher for students who did not consume a sweetened beverage ($p < 0.001$).

Application

These results suggest that middle school students who consume a sweetened beverage at lunch reduce their consumption of more nutrient-dense food items. However, total caloric consumption did not differ between the two populations. Further research is needed to identify methods that can improve nutrient-dense food consumption by middle school students.

Snackwise Nutrition Rating System

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Purpose/Objective

This purpose of this study was to develop an evaluation tool, called Snackwise, in order to measure the overall nutritional quality of snack foods and help schools to promote and students to select healthier snack foods from vending, a la carte lines, and other venues.

Method

Using the tool, 97 snack foods were evaluated based on ten nutritional parameters, including calories, total fat, saturated fat, sugar, protein, fiber, calcium, iron, vitamin A, and vitamin C. The foods were categorized by nutrient content and compared to ratings in the Index of Nutrient Quality (INQ). As a second method of validation, dietitians with greater than five years of experience in counseling rated 65 of the foods on a sliding scale of nutritional quality.

Results

Snackwise was validated against INQ ratings, dietitians, and summed nutritional components. The consistency rating between dietitians (by way of an intra-class coefficient) was 0.68. The evaluation model clearly segmented snack foods as least healthy, moderately healthy, and most healthy based on nutrient quality. The results were presented at the American Academy of Pediatrics Conference, Section on School Health. The research is currently under review for publication with the American Dietetic Association.

Application

The Snackwise system can be used by schools to evaluate and promote healthier snack choices in vending machines, a la carte lines, and other venues. The system uses computer software to rate snack foods and includes promotional posters to direct students to choose healthier snacks. Research is continuing to determine the efficacy of the Snackwise system. The authors hope to show that students will select snacks with a better nutrient profile without compromising school foodservice program revenue.

School Lunch Prices by Region as Compared to the Cost of Lunches from Home

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Purpose/Objective

The purpose of this study was to compare the prices charged for elementary, middle, and high school reimbursable school lunches (RSL), by U.S. Department of Agriculture (USDA) region. Then, the RSL prices for Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin were compared to the cost of lunches students brought with them from home (LFH).

Method

The school district lunch prices were collected by E-mail and categorized by USDA regions. Prices for single-serving lunch components were collected from six supermarkets in Michigan and the mean for each item was calculated. The components were combined in different ways to

fit the USDA calorie levels for elementary lunches (664 kcal) and middle and high school lunches (825 kcal).

Results

Using ANOVA, elementary, middle, and high school RSL prices were significantly different by region (n=1245, n=1181, and n=1130, respectively). For elementary, middle, and high schools, Southeast region prices were the lowest and Midwest prices were the highest. The mean Midwestern elementary RSL price (n=158) was \$1.70 (\pm .31), while LFH (n=20) averaged \$3.10 (\pm .77). Midwest middle school RSL prices (n=157) were \$1.92 (\pm .37), while LFH (n=18) prices averaged \$3.43 (\pm .63). The mean Midwestern high school RSL price (n=157) was \$1.95 (\pm .36), with LFH (n=18) averaging \$3.43 (\pm .63). These differences were significant ($p < .0001$).

Application

School lunches have been shown to be nutritionally superior to lunches brought from home, and this cost comparison has shown that school lunches are significantly less expensive than caloric-equivalent lunches from home. Foodservice personnel can use these results to document the cost savings of school lunches to students, parents, and school administrators.

Training Needs Assessment of Family Daycare Home Providers Participating in the Child and Adult Care Food Program

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Purpose/Objective

The purpose of this study was to assess the training needs and issues associated with Family Daycare Home (FDCH) providers participating in the Child and Adult Care Food Program (CACFP).

Method

A descriptive study was conducted using a telephone survey. Survey questions focused on identifying factors that 1) depict a FDCH provider; 2) identify the desired method of training and training topics; 3) investigate the interest in receiving training from a provider mentor; and 4) ascertain the usefulness of training equipment available in the FDCH setting. Trained interviewers conducted the telephone survey. A stratified proportional random sample of 700 FDCH providers was systematically chosen to equally represent the seven U.S. Department of Agriculture (USDA) regions. A mailed letter was sent to the sampled providers informing them of their selection, to expect a telephone call, and to inform them of the voluntary nature of the study.

Results

Fifty-two percent of the 364 individuals selected agreed to participate in the study. The final sample, which represented 31 states, completed the telephone survey. The responses from each of the seven USDA regions ranged from 47 to 57 individuals. Fifty-nine percent (n=214) reported having some college to a baccalaureate degree. Ninety-six percent (n=355) reported participating in training, and 90% (n=318) indicated that training opportunities are conveniently located. Eighty-six percent (n=314) revealed that evenings and weekends are the most desired

time for training, while 76% (n=267) indicated hands-on activities and small group training as their most desired method of education. Ninety-four percent (n=342) conveyed that they would attend sponsor-approved training conducted by a mentoring provider. The top five training topics identified as important to a quality FDCH are 1) promoting health and safety; 2) identifying child development issues; 3) encouraging good nutrition and healthy eating; 4) assessing behavior and discipline issues; and 5) ensuring quality childcare.

Application

The findings indicate that FDCH providers embrace training. In order to properly train FDCH providers, state agencies, USDA, sponsoring organizations, and the National Food Service Management Institute (NFSMI) would be advised to focus on exploring diverse forms of training delivery, including designing training resources for use by a mentoring provider.

Focus Group Research Identifies Issues Associated with Servicing the Nutritional Needs of the Pre-Kindergarten Child

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Purpose/Objective

The purpose of this study was to identify key issues associated with servicing the nutritional needs of pre-kindergarten children in the school setting.

Method:

A qualitative focus group research methodology was used in this study. Based on a literature review, states were profiled to identify state-funded pre-kindergarten programs. School nutrition directors from selected school districts in four states were asked to participate in the study, in order to determine their willingness to contact other school professionals from their district who were identified as important to the discussion process. The participants were asked to identify a school nutrition manager, principal, classroom teacher, and federal program director, such as an early education or special education specialist. Five to seven participants contributed to four focus groups in each district. Data were collected systemically by asking semi-structured and open-ended questions, each having a distinctive function in the focus group research process. Each focus group discussion was limited to a maximum of two hours.

Results

Following transcription of the focus group sessions, researchers categorized the responses. Participants indicated that the roles be classified into four areas: administration, provision of quality meals, nutrition education, and encouragement of children to eat. Challenges that participants encounter focused on child-friendly menus, developmental issues, special nutrition needs, administrative details, parent issues, and teacher issues. Factors that should be considered to ensure a quality program were grouped into environment, communication, training, child-centered focus, administration and leadership issues, and menu and food choice concerns.

Application

These data support the development of a quantitative survey questionnaire, in which a national sample of school professionals, such as a school nutrition director, school nutrition manager,

principal, pre-kindergarten classroom teacher, and early education director, would be asked to assess their perceptions, practices, and barriers to servicing the nutritional needs of the pre-kindergarten child.

On-site Evaluation of the Statewide Teleconference "Increasing School Meals Participation – Creative Strategies that Work!"

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Purpose/Objective

The purpose of this research was to evaluate the effectiveness of a teleconference for school foodservice (SFS) personnel. Objectives included determining the perceptions that SFS employees had of the teleconference and ascertain their intentions to act based on the information presented.

Method

A one-day satellite teleconference was developed and presented for SFS personnel through Project PA, a collaboration venture between the Pennsylvania Department of Education (PDE), Division of Food and Nutrition, and the Pennsylvania State University. Teleconference objectives included providing motivation and information to help SFS personnel initiate or improve participation in school breakfast programs (SBPs). Through pre-taped segments, a variety of creative strategies featuring successful SBPs from throughout the state were featured. Expert panels responded to questions from participants at the 28 downlink sites. A total of 350 SFS employees attended the teleconference. A 56-item pre- and post-teleconference survey was developed and administered.

Results

A total of 291 surveys were returned for an 83% response rate. Descriptive statistics were conducted using SPSS (Version 11.5.1). Participants' knowledge of strategies to improve school meals participation increased significantly ($p < 0.001$) as a result of the teleconference, as did their rating of teleconferences as a training method. Participants rated the teleconference "worthwhile" with a score of 7.8 (± 2.1) on a ten-point scale, with ten representing "completely worthwhile." Participants indicated a likelihood to implement one or more of the creative strategies presented. Seventy percent ($n=191$) of participants indicated they would try the Grab 'n' Go breakfast program, 41% ($n=112$) stated they might try the universal free breakfast program, and 39% ($n=110$) showed an interest in the "Breakfast in the Classroom" program.

Application

Alternative SBP delivery methods are accepted by SFS personnel when presented in a compelling format using colleagues as role models. An edited video of this teleconference is available through PDE, and proceedings are available through the Project PA website, <http://nutrition.psu.edu/projectpa>.

School Nutrition Program Directors Rate Resources for Menu Planning, Product Selection, and Other Uses

Martha T. Conklin, PhD, RD, LDN; Laurel G. Lambert, PhD, RD; and Carolyn U. Lambert, PhD, School of Hospitality Management, The Pennsylvania State University, University Park, PA.

Purpose/Objective

The purpose of this study was to identify how school nutrition program directors in small school districts use and rate information sources associated with their job. Specific objectives were to identify the directors' use of information resources, determine ratings for usefulness and frequency of use for each resource, and to investigate whether these ratings were associated with director and program characteristics.

Method

A questionnaire was mailed nationwide to a random sample of 1,000 school nutrition program directors working in school districts with 5,000 students or less. Respondents from 279 districts returned usable questionnaires. Data analysis included frequencies, chi-square, and analysis of variance (ANOVA).

Results

School nutrition program directors rated each information resource differently depending on intended usage. The U.S. Department of Agriculture (USDA) publications were more frequently used for menu planning and product/recipe selection. Food shows and exhibits at state conferences were most frequently used for marketing and getting ideas about special functions. USDA commodity materials and recipes topped the list of resources that were rated very useful and very often used.

Application

Consistent with other professions, school nutrition program directors from small districts used resources that are familiar, trustworthy, cost-effective, and easily accessible. The discovery that USDA commodity materials and recipes were the most useful and most often used has important implications for the foodservice industry, as well as for those government agencies responsible for producing these types of information resources.

No Increase in Snack Foods and Drinks Brought from Home in Response to Reduced Snack Foods Sold in the Elementary A La Carte Line

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Purpose/Objective

A barrier to reducing the availability of foods high in fat and sugar in schools is the concern that children, in response, would bring such unhealthy items from home. The purpose of this study was to document whether elementary school children would bring snack foods from home when healthier food items were substituted in an a la carte line.

Method

The pilot study was conducted in one elementary school with a hot lunch and an a la carte line. The school population included approximately 900 students, 95% of whom were eligible for free

or reduced price meals. For five days, researchers counted the number of food and beverage items brought into the school cafeteria by students in each class. Then, canned drinks, ice cream, and regular chips were replaced with fruit juices, bottled water, reduced-fat chips, raisins, fresh fruit, and vegetables in the a la carte line. For another five days, food and beverage items brought into the cafeteria were counted.

Results

During the baseline period, NSLP meal participation was 97% and 3% of lunches were from home. An average of 133 snack items were sold daily (salty snacks=62, sugary snacks=34, canned drinks=23, reduced-fat chips=10, pretzels=2, pickles=1, and raisins=1) and 71 items were brought from home (canned drinks=26, sugary snacks=24, and salty snacks=21). During the intervention week, NSLP meal participation was 98%, with 2% of students bringing lunches from home. Daily snack sales dropped to 90 (reduced fat chips=39, water=12, fruit juice=9, fresh fruit=9, pretzels=9, raisins=9, vegetables=2, and milk=1) and there was no significant increase in food items brought from home.

Application

These results suggest that elementary students will purchase healthier snack foods if they are made available to the children in the school cafeteria. School foodservice departments should continue to improve school food environments.

Evaluating Food and Beverage Consumption of Middle School Students Using Meal Component and Period of Day

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Purpose/Objective

This study compared the contribution made to childhood eating patterns by items consumed at school to those consumed outside of school. Objectives included examining the relationship between the period of day (before school, during school, after school) and the consumption of meal components (meat/meat alternate, grains/breads, fruit, vegetable, milk, sweetened beverages, sweets/desserts, water, and chips/salty snacks), and comparing the results to the Food Guide Pyramid.

Method

A one-day food diary was pilot tested. In Fall 2004, information describing the study was distributed to students enrolled in science and health classes at two urban middle schools in Texas. Students returning signed consent forms were given instructions about the diary, which teachers passed out and collected. Sixty-three students participated in the study, including 36 girls and 27 boys between 11- and 15-years-old. Thirty-two were white, 15 were Hispanic, eight were Asian-American, two were African-American, and five were multi-racial. Results were analyzed using cross tabulation.

Results

Of 984 items reported, 706 were consumed outside of school. Review by meal component revealed 211 servings of grains/breads, 152 servings of meats/meat alternates, 102 sweetened

beverages, 101 servings of sweets/desserts, 98 servings of water, 96 items of fruit, 96 servings of milk, 80 servings of vegetables, and 48 items of chips/salty snacks. About a quarter of fruit (n=26) and sweets/dessert (n=29) and almost half of milk (n=39) and vegetable (n=35) consumption occurred during school. Limited servings of water (n=14) and sweetened beverages (n=6) were consumed during school hours. About one-third of meats/meat alternates (n=56) and grains/breads (n=62) were consumed during school. A comparison to the current Food Guide Pyramid suggested a disproportionately high daily consumption of meats/meat alternates, sweetened beverages, and sweets/desserts, relative to grains/breads, fruit, vegetables, and milk.

Application

This study outlines information concerning how food and beverage availability at middle schools contribute to the daily eating patterns of students. This study is of value to school foodservice professionals, because a greater understanding of where specific types of food are consumed can lead to more informed decision-making during the development of school nutrition policies.