

Alternative Breakfast, Special Provisions, and Discipline Outcomes

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Research Objectives

The purpose of this research was to evaluate the relationship between alternative breakfast offerings and discipline referrals in high schools in Arkansas.

Methods

Data were gathered from Arkansas child nutrition records and publicly available school level data. Schools were matched by local education authority identification and relational tests were conducted.

Results

A total of 1,067 LEA's were analyzed using the most recent and complete datasets from the 2016-2017 school year. There were 369 schools using alternative breakfast models including grab and go, breakfast after the bell, and second breakfast, or any combination of these. A total of 34 expulsions, 1,742 in-school suspensions, 1,254 out-of-school suspensions were reported for the year. Schools that provided alternative breakfast options were more likely to have lower rates of suspensions.

Application of Results

These preliminary results indicate that further research should be done to investigate the relationship between school meals and disciplinary action. Additionally, attendance and test scores should be considered as part of the overall model to identify the effect school meals could potentially have on overall academic success.

Behavioral Intention of School Nutrition Employees to Perform Food Safety Practices

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Research Objectives

This research used the Theory of Planned Behavior to investigate school nutrition employees' beliefs about three food safety practices: proper cleaning/sanitizing of food contact surfaces, proper handwashing, and using a thermometer. Barriers within the school environment were explored and used to describe practical recommendations.

Methods

Questionnaires (n=3,850) were mailed to child nutrition directors in 163 randomly chosen school districts in seven states and distributed to employees. The questionnaire was developed based on the results of an elicitation study and included 31 questions to gather data on employees' attitudes, social pressures, perceived behavioral controls, beliefs, and demographics. Principle axis factor analysis and multiple regressions were used for data analysis.

Results

A total of 408 questionnaires (10.6%) were completed. Results indicated that child nutrition employees have very high intention to properly clean/sanitize work surfaces ($M=6.9\pm0.31$), wash hands ($M=6.9\pm0.40$), and use a thermometer ($M=6.9\pm0.37$). Employees had positive attitudes towards cleaning/sanitizing ($M=6.8\pm0.47$), handwashing ($M=6.9\pm0.40$), and thermometer use ($M=6.9\pm0.37$). Employees place high importance on identified social pressures for cleaning/sanitizing ($M=6.8\pm0.40$), handwashing ($M=6.8\pm0.37$), and thermometer use ($M=6.8\pm0.45$). Employees also perceived high levels of control for cleaning/sanitizing ($M=6.4\pm1.07$), handwashing ($M=6.6\pm0.86$), and thermometer use ($M=6.5\pm1.06$). Social pressures and perceived behavioral control significantly predicted behavioral intention ($p\leq0.001$) for each of the three behaviors. However, attitude did not significantly predict cleaning/sanitizing ($p=0.63$), handwashing ($p=0.721$), and using a thermometer ($p=0.463$).

Application of Results

Based on the results, training interventions should be developed and/or modified to improve food safety behaviors of employees to prevent foodborne illness by focusing on social pressures and perceived barriers identified in the study. Training effectiveness could be evaluated by assessing perceived social pressures to engage or not engage in food safety behaviors properly and behavioral controls to perform the practice.

Best Practices for Maintaining the Temperature of Milk Served Outside of the Cafeteria

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Research Objectives

Determine commonly used milk service procedures for breakfast outside the cafeteria; measure internal milk temperatures maintained by these procedures under high and low ambient temperatures.

Methods

School Nutrition Directors in each USDA region were surveyed to determine procedures for milk service during breakfast outside the cafeteria. Common holding conditions were simulated. Thirty single milk servings of different packaging types (carton, bottle, pouch) were placed in containers (milk crate, sheet pan, steam-table pan, soft-side cooler, hard-side cooler) with no ice (all containers), loose ice (steam-table pan, soft-side cooler, hard-side cooler) or ice-sheets (sheet pan, steam-table pan, soft-side cooler, hard-side cooler). Packed containers were exposed to high (89°F) and low (74°F) ambient temperatures for four hours; data loggers tracked milk temperatures at five minute intervals. Data were analyzed using SPSS MIXED procedure.

Results

Milk temperature varied by container and cooling method ($P<0.05$), but not milk packaging. Hard and soft coolers (used by 58% of respondents) maintained the lowest temperatures, followed by service pans and milk crates, which were used by 5% of respondents. Sheet pans were least effective ($P<0.05$). Loose ice was the most effective cooling method ($P<0.05$). Ice sheets were used by 33% of respondents, but were less effective than loose ice ($P<0.05$). A majority of respondents restocked unused milk (59%); 64% indicated they checked the milk temperature within one hour of its return to the cafeteria.

Application of Results

Because most unused milk is restocked, effectively packing milk for service outside the cafeteria is important for quality and safety. Though ice-packs and sheets are the most commonly used, loose ice was found more effective in maintaining temperature. Soft-side and hard-side coolers maintained the lowest temperatures. When ice and insulated containers are not available, leaving milk in the original crate or placing it in a steam-table pan is preferable to serving from a sheet pan.

Evaluating the Impact of School Gardens with Conway Public School Students

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Research Objectives

The purpose of this research is to collect baseline biometric data on a sample of public school children in order to assess the impact of school gardens on fruit and vegetable intake, body composition measures, and physical activity level. This research is a primary analysis of data collected as part of a school garden and farm to school intervention.

Methods

A post-test only design with a comparison group was used to collect baseline biometric data on a sample of public school children attending classes on Food and Nutrition, Nutrition/Wellness, and/or Agriculture (N = 298). Outcome measures were skin carotenoid level, body composition measures, and physical activity level. Independent T-Test used to evaluate differences in outcomes based on classroom participation in the school garden. One-way ANOVA was used to determine if outcomes differed significantly by amount of time spent gardening at school or gardening outside of school.

Results

No significant differences between classrooms in skin carotenoid level, BMI, lean body mass, or total activity level. Outcome measures did not differ significantly between students who reported spending more or less time in the school garden. Students who gardened at school did have significantly higher weight, body fat mass, percent body fat, and visceral body fat.

Application of Results

School gardens should be conducted in conjunction with other systems-levels approaches in order to combat childhood obesity because they can easily incorporate other components such as nutrition education and community involvement, which have been shown to positively impact factors known to contribute to childhood obesity. While this research has limitations, the purpose is to provide baseline biometric data in order to serve as a springboard for subsequent data collections. The next phase of this research will assess how fruit and vegetable intake, body composition, and physical activity level have changed with further exposure to the gardening intervention and farm to school activities.

Home Availability and Preference of Fruits and Vegetables, and Family Support Influences in School-aged Children

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Research Objectives

Family and school environments contribute to influencing and shaping the development of eating behaviors in school-age children. The purpose of this study was to describe student's fruit and vegetable consumption as well as their perceived influences.

Methods

Data were collected as part of a larger evaluation of a Farm to School program and school gardens which included perspectives from the students, parents, and school faculty/staff. This study specifically looked at the data of 3rd -12th grade students who responded to a 53-item survey and parents who responded to a 36-item survey.

Results

Of 824 students and 260 parents, about 1/3 of the students and 1/2 of the parents reported that fruits and vegetables were readily available at home; the top three items were apples, bananas, and potatoes. Students generally reported greater healthy eating support behaviors from family members than from friends. Parents, doctors or nurses, and school classrooms were the top three resources students reported using to learn about healthy eating. The availability of fruits and vegetables, protein-rich foods, whole grain foods, and non-preprocessed/non-prepackaged foods in school lunch were all reported as very important to parents. Significant correlations were found between family supporting behaviors and fruit and vegetable consumption

Application of Results

The results of this study showed the importance of family supporting behaviors in positively affecting children's eating behaviors. Of importance to school nutrition professionals is the integration of nutrition education into classrooms and promotion of fruit and vegetable availability at home to increase overall consumption.

Indicators for Successful School Wellness Programs

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Research Objectives

The Child Nutrition and Woman, Infant, and Children (WIC) Reauthorization Act 2004 required local education agencies (LEAs) participating in Child Nutrition Programs to develop local wellness policies beginning in school year (SY) 2006-07. There has been questions surrounding the evaluation of Wellness Policies and more recently the final rule required LEAs to develop revised local school wellness policies in SY 2016-17. The purpose of this study was to identify best practices of successful wellness programs in Arkansas.

Methods

Twenty “Wellness Champion” identified as key informants, were contacted via email. Participants were emailed 14 open ended questions and given one week to respond. Responses were compiled and explored for common themes by two researchers using a constant comparative method.

Results

Seven participants provided complete responses. Common themes for success of wellness programs in these districts included administrative support, a focus on staff, faculty, and student wellness, as well as a holistic view of student health. Champions provided information on initiatives like alternative breakfasts, expanded lunch offerings, snack programs, and afterschool meal programs to improve overall mental, physical, and behavioral health. Incorporation of child nutrition personnel, applications for grant funding, and persistent marketing were commonly reported.

Application of Results

Champions reported long-term commitments to wellness programs and increasing support from community and family members. Incorporating these best practices is essential for wellness success and continued momentum.

Milk Consumption in Schools: Students' Preferences and Environmental Considerations

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Research Objectives

Describe patterns of milk consumption and identify student preferences based on availability of flavors at seven districts in the Midwest.

Methods

Waste from 567 milk containers sold as part of NSLP in various grades at seven districts with different characteristics was analyzed. Observational data were collected with a structured checklist and included environmental influences (e.g. type and location of milk cooler). Milk waste was measured at tray return/waste areas at all sites for each type of milk sold. Mean volume wastes and per carton waste averages were calculated for each type of milk sold by district and overall.

Results

Fat free unflavored and fat free chocolate flavored milk were offered in all districts while three also offered strawberry; flavored milk was most preferred with highest selection and consumption rates. Unflavored milk average market share was 22%; market share was taken from chocolate when strawberry was added. Overall, 33% of all milk sold was wasted with district averages ranging 11.67 % to 43.47%. Average unflavored milk waste ranged 12.5% to 60.9% while flavored milk waste ranged 11.2% to 39.8%. In every school district, milk waste averages were lower among flavored than unflavored milk. All milk was sold in fiberboard 8 ounce containers, one district offered straws, all districts scheduled 20 to 25 minutes for lunch period, half of milk coolers were at beginning of the line and all were one sided, drop door coolers.

Application of Results

More research is needed to investigate impacts of food costs and inventory management of milk beverages, and effects of more choices on waste. Multiple choices affect service time, which means less time for eating and socialization. Nutrition program administrators should carefully consider popularity, inventory management and environmental factors when determining types and number of milk choices for cafeterias in their districts

Operating Practices for Listeria Control in Child Nutrition Programs

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Research Objectives

Listeria monocytogenes (Lm), a foodborne pathogen with high mortality, is known to contaminate foods served in schools. This exploratory research assesses Lm risk in child nutrition programs by examining adherence to operating procedures known to control Lm, and measuring hygiene of kitchen surfaces through microbial analysis.

Methods

Kitchen managers from four schools from one Midwestern district were interviewed using a 65-question checklist covering product handling, temperature control, cross-contamination, verification, cleaning/sanitizing, recall plans, and Lm control programs. One school was selected for microbial analysis of surfaces. Surfaces (n=67) corresponding to zones 1-4 (1=food contact surfaces; 2=non-food surfaces contact adjacent to 1; 3=non-food contact surfaces distant from 1; 4=non-food contact outside of the production area) were sampled. Aerobic plate count (APC) and *E. coli*/coliform counts were used as indicators of hygiene, which may correspond to potential areas of Lm contamination. Surface samples were collected using buffered peptone-water moistened sponges, serially diluted and plated onto APC and *E. coli*/coliform Petrifilm™ plates for enumeration.

Results

Highest scores on the checklist were achieved on cleaning/sanitizing (M=52%±14) and cross-contamination control (M=48%±5). Schools scored lowest on recall plans (M=5%±11), and no schools had Lm control plans. Microbial analysis showed non-food contact surfaces in zones 2 and 3 demonstrated the highest levels of microbial contamination. Zone 3 surfaces were least hygienic, with 38.8% of samples harboring APC populations of >1.3 Log₁₀ CFU/cm², and coliform /*E. coli* counts were obtained from 16.6% and 11% of samples, respectively.

Application of Results

Poor sanitation in zones 2 and 3 increases the likelihood of cross-contaminating food contact surfaces, which is especially problematic in schools serving ready to eat foods, because of their likelihood to support the growth of Lm. Sanitation practices targeting Lm control could reduce the likelihood of contaminating foods, and adopting these practices as standard operating procedures lowers Lm risk in schools.

Operating School Meal Programs in Rural Districts: Challenges and Solutions

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Research Objectives

The goal of this study was to explore unique issues that rural school nutrition professionals face in operating successful school meal programs, and their strategies for overcoming those barriers.

Methods

This study was conducted through 10 key informant interviews and three focus groups with rural school nutrition practitioners, researchers, and other stakeholders. Interview and focus group participants were asked about challenges, existing effective practices, and future needs for rural school meal programs. The interviews and focus group data were analyzed by thematic coding.

Results

Perceived key challenges specific to rural schools were limited administrative capacity, hiring and retaining qualified staff, physical infrastructure limitations, accommodating students with long travel times to school, and limited food supply purchasing options. Perceived existing effective practices included purchasing cooperatives, peer support, community collaboration, inventive serving strategies, and training and technical assistance.

Application of Results

Our research identified consensus on effective practices that can address challenges to operating successful meal programs in rural school districts. Practices that could be adapted by other rural school meal programs include joining purchasing cooperatives, accessing peer network support, increased staff training and technical assistance, inventive food delivery strategies, obtaining additional funds for equipment through catering and other means, and flexible meal schedules.

The Fresh Fruit and Vegetable Program (FFVP): Does it promote requests for fruits and vegetables at the store and at home?

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Research Objectives

To examine potential associations between children who participate in the FFVP and family food shopping practices including the child's fruit and vegetable requests made at the store.

Methods

During the 2014-2015 school year, six elementary schools— three that participated in the FFVP and three that did not participate— were selected from three school districts within the Phoenix metropolitan area. Fourth grade students (n=296) and parents of all elementary school children (n = 205) participated in two separate surveys. Children were asked about their knowledge and attitudes towards fruits and vegetables; their preferences for fruits and vegetables; their requests at the store for fruits, vegetables, and energy dense snacks; and their consumption of fruits and vegetables. Parents were asked about their child's fruit and vegetable preferences; their child's request at the store for fruits, vegetables, and energy dense snacks; their fresh fruit and vegetable purchasing frequency; and the availability of fruits and vegetables in their home.

Results

Children from FFVP-participating schools reported greater knowledge of the benefits of consuming fruits and vegetables; more positive attitudes towards these foods; greater preferences for fruits and vegetables; and higher consumption of fruits and vegetables. Parents of children from FFVP-participating schools reported purchasing fresh fruits and vegetables more frequently; and their child had a greater preference for fruits and vegetables.

Application of Results

This study suggests the positive associations between a child's participation in FFVP and their family's food shopping behaviors and home food environment. FFVP's potential reach outside of the school and into the home suggests the need for a cohesive partnership between public health departments, school nutrition programs, and food outlets. This strategic collaboration can foster and enhance food environments that accommodate the purchase of fruits and vegetables and reflect the key message to eat more fruits and vegetables as promoted by school nutrition programs.