The hallmark of a research journal is that manuscripts are peer reviewed. The peer review process helps to ensure that manuscripts are methodologically sound, and that results of the research are important and applicable to practitioners in child nutrition programs. This critical peer review process is very time consuming; thus, we would like to extend sincere appreciation to the professionals who reviewed manuscripts for the 2001 issues of *The Journal of Child Nutrition & Management*. We invite individuals who are interested in serving as reviewers to contact the Journal editor.

| Janet Anderson | Shirley Gilmore | Connie Mueller, SFNS |
| Jean Anderson | Rebecca Gould | Alice Jo Rainville, SFNS |
| Susan Barker | Bonnie L. Hackes | Barbara Scheule |
| Becky Bays | Steve Hiemstra | John Sevier, SFNS |
| Julia Bryant, SFNS | Paulo Hudon | Carol Shanklin |
| Martha T. Conkiin | Mary Idleman, SFNS | Judy Stracener |
| Debbie Daniel, SFNS | Carol J. Klitzke, SFNS | Wendy L. Stuhldreher |
| Beth Egan, SFNS | Carolyn U. Lambert | Mildred Switzer |
| Susan Ehrhart, SFNS | Pat Luoto | Cynthia Van Druff, SFNS |
| Anita Jo Finch | Nadine Mann | Dale Weir |
| Connie Georgiou | Josephine Martin | Katie Wilson, SFNS |
| Lora Gilbert | Lucy McProud | |
Another school year is well underway, and the American School Food Service Association (ASFSA) is off to another great year! ASFSA President Marcia Smith selected Caring for Communities We Serve as this year’s theme, which emphasizes the importance of a community’s child nutrition programs and the interdependence of these programs with the community.

This issue features two articles that focus on community. A current issue paper focuses on developing links between school foodservice and local growers and producers to increase the amount of local foods purchased for school foodservice programs. Stroehm and Gregoire present the benefits and obstacles of purchasing locally grown food and describe pilot projects in which schools have connected to local food sources. They also provide resources for school foodservice directors who are considering local food purchasing.

Meyer et al. focus on the school community to determine what the barriers are to creating a healthy nutrition environment in middle school. Focus groups with administrators, teachers, coaches, school foodservice managers, and directors led to the conclusion that “participants did not feel the environments in middle grades were conducive to healthy eating habits.” Thus, barriers to a healthy nutrition environment were identified. It truly does take a community to ensure that healthy nutrition environments are provided to children.

Food safety continues to be of concern in the practice and focus areas of research. Barclay, Greathouse, North, and Cale report on food-handling knowledge and practices of 4th- and 5th-grade students. Several unsafe food-handling practices for these children were identified, including the age-old favorite of eating raw cookie dough.

Kieklighter and Broussard used focus groups to explore African-American adolescents’ perceptions, the factors that influence their food choices, and how they view the impact of eating behaviors on future health. Additionally, Gilbert and Shanklin report on nutrient content and cost of entrees. They encourage menu planners to consider nutrients per penny in making menu decisions.

Professional development and growth, competency, and lifelong learning are just a few of ASFSA’s values. Two studies identify professional development needs, one using a national sample of school foodservice directors and another using a sample of foodservice managers and directors in Alabama.

Abstracts from the Child Nutrition Showcase (Poster Sessions) at ASFSA’s 54th Annual National Conference also are included in this issue. These abstracts relate to innovative facility design, marketing and customer service, nutrition education and training, training and staff development, and research.

Dr. Martha Conklin wrote her last NFSMI Research Update for this issue. Conklin is leaving the Institute to begin a new job at The Pennsylvania State University. I wish her the best, and know that she still will be involved with child nutrition programs and the Journal.

Community is important for the Journal, too. I would like to thank all of the authors and reviewers for their hard work and contributions to this publication. I invite readers to submit manuscripts and share their ideas, research, and to serve as manuscript reviewers. Our research community supports the mission of advancing good nutrition for all children.

Jeannie Sneed, PhD, RD, SFNS
Editor
Announcements

2001 Child Nutrition Showcase Awards (see Abstracts beginning on page 101)
Best Practices in Nutrition Education: Chong, C., Fornas, H.
Best Practices in Training and Staff Development: Rodgers, K., Brock, A., Golangco, M.B., Uy, A.
Best Practices in Marketing and Customer Service: Chong, C., Rodon-Ramirez, D.
Innovative Facility Design: Lee, J.
Research Related to Child Nutrition Programs: Lee, K., Shanklin, C.W.
2001 Kathleen Stitt Award: Keith Rushing, R.D., Texas Tech University

2002 Kathleen Stitt Award

The Kathleen Stitt Award is awarded to help defray travel expenses for a graduate student or faculty member participating in the Child Nutrition Showcase at the ASFSA Annual National Conference. Preference will be given to graduate students. One award will be made annually; however, the committee may consider granting two awards per cycle.

Awards will be made directly to the individual; the value of this award will not exceed $750. The recipient of the Kathleen Stitt award must attend ASFSA’s Annual National Conference. Failure to do so will result in the recipient being required to return award proceeds back to the School Food Service Foundation. The Financial Aid Committee must receive all submissions by May 1 each year.

Restrictions: Members of the ASFSA Executive Board, the SFSF Board and/or any ASFSA or SFSF standing or ad-hoc committee, advisory board, or task force are not eligible to apply until one calendar year after completion of their board/committee service. Employees of the National Food Service Management Institute are not eligible to apply for the Kathleen Stitt Award.

For additional information on the Kathleen Stitt Award, contact the ASFSA Headquarters Office at (800) 877-8822.

ASFSA’s Call for Volunteer Abstracts for the 2002 ANC

The 11th Annual Poster Session (now called the Child Nutrition Showcase) will take place during the ASFSA Annual National Conference (ANC) in Minneapolis, Minn., in July 2002. Projects featured in the Child Nutrition Showcase should focus on marketing and customer service, nutrition education, training and staff development, innovative facility design, and research related to child nutrition programs.

This call for abstracts is open to anyone interested in submitting a project for presentation during the Child Nutrition Showcase at the conference. All abstracts must be received by ASFSA’s Research Committee chair before being accepted.

Guidelines for Acceptance of Child Nutrition Showcase Abstracts

- Deadline for abstract submission is March 15, 2002.
- All abstracts must be typed within the margins of the box provided on the application form.
- Abstracts for research should summarize the purpose, method, findings, conclusions, and implications of the study or project for child nutrition programs. Abstracts for marketing, nutrition education, and training should include the purpose, target market, description of the project or program, and application to other child nutrition programs. Abstracts for innovative facility design should include the purpose, a description of process, and summary of the result.
- Capitalize the title of the paper and ONLY the name of the author who will present the poster. Indicate the complete address for ONLY the author presenting the poster.
- The Child Nutrition Showcase will be presented at ANC 2002.
- All authors who present posters must pay the appropriate ASFSA member or nonmember registration fee for the Annual National Conference.
FOR ADDITIONAL INFORMATION OR TO SUBMIT AN ABSTRACT APPLICATION, CONTACT:

Beth Minicenoyer Egan, M.Ed, RD, SFNS
Penn State Dietetic Programs through Distance Education
201 Mateer Building
University Park, PA 16802
(814) 863-7539 (phone)
(814) 863-4257 (fax)

We encourage you to submit your abstract application electronically through the ASFSA Web site. Look for the Poster Session link on the ASFSA home page at www.asfsa.org.

GUIDELINES FOR CHILD NUTRITION SHOWCASE POSTER PRESENTATIONS

Poster presentations provide for informal visual and verbal exchanges between the presenter and the audience.

1. You or one of your coauthors must remain with the poster presentation for the designated (usually 2-hour) period.
2. Plan to arrive 1 hour before the session begins to prepare your presentation. Assistants will be in the area to help you with any special problems.
3. You will have a 4-by-6-foot corkboard on which to mount your presentation. You are responsible for your own supplies, including thumbtacks. Do not write, paint, or make marks on the corkboard.
4. All illustrations, graphs, etc. should be finished prior to your presentation. Visual aids must be legible from a distance of at least 5 feet.
5. Graphics should be simple, colorful, well labeled, and legible.
6. No special equipment—such as an audiovisual projector—is permitted. The entire presentation must be attached to the poster board.
7. You should prepare a sign containing the title of your presentation, your name, affiliation, and any coauthors.
8. Mount a copy of your abstract on the corkboard. This should be prepared using a large-font format. You also may wish to have extra copies of your abstract available for distribution.
9. Plan to give short, informal presentations of your work during the designated period. These should occur as clusters of attendees gather near your poster display. Remember to be flexible and gear your presentation to the audience.

**Example of Poster Board Layout**

**Graph**

**Table**

**Figure**

1. ■ ■ ■
2. ■
3. ■
4. ■

**Title**

**Authors**

**Summary**

**Objective**

**Method**

**Discussion**

**Photo**

**Photo**
CHILD NUTRITION SHOWCASE ABSTRACT APPLICATION FORM

Title of Poster: ________________________________

Authors (list first name, middle initial, last name, credentials):

1. (primary) ________________________________ 2. ________________________________

3. ________________________________ 4. ________________________________

(If the abstract is accepted, the abstract presenter* must be one of the above authors. The information requested below is only for the abstract presenter.)

First Name ___________ Middle Initial ___________ Last Name ___________ Credentials ___________
Job Title ___________________________ Place of Employment ___________________________
Street Address ___________________________
City ___________________________ State ___________ Zip ___________
Telephone Number/Extension ___________________________

*All correspondence will be sent to this person.

Category for Poster (check one)

__________ Nutrition Education and Training ___________ Training and Staff Development

__________ Marketing and Customer Service ___________ Innovative Facility Design

__________ Research Related to Child Nutrition Programs
Current Issues

Innovations in School Food Purchasing: Connecting to Local Food

Catherine H. Strohbehn, PhD, RD; and Mary B. Gregoire, PhD, RD, FADA

There is much local interest in and government support for efforts to develop stronger links between schools and local growers and producers. Several successful programs have been developed that provide models for school foodservice directors who are interested in this effort. Benefits and challenges do exist in the development of these new markets, both from the perspective of the school foodservice professional and the producer. Discussions of the benefits, obstacles, and pilot projects are included in this report.

Child nutrition program (CNP) managers constantly are challenged to find new and better ways to provide healthful, nutritious meals and snacks for the nation’s children. Programs such as Team Nutrition and the Small Farms/School Meals Initiative provide innovative ways to help better connect schools with their communities and enhance the quality of meals served in school foodservices (see www.fns.usda.gov for additional information). Shirley Watkins, former Under Secretary for Food, Nutrition, and Consumer Services, U.S. Department of Agriculture (USDA), stated, “The Small Farms/School Meals Initiative is an important step toward improving both the economic stability of small farmers and the long-term health of children in our school systems” (USDA, 2000).

Competencies related to food procurement have been identified as important and are frequently performed by school foodservice managers (Sneed & White, 1993). Traditionally, the purchasing of food for schools has been done through vendors, who supply food items year round from sources around the world. Many school nutrition professionals who purchase food for school meals do not realize that this food travels an average of more than 1,000 miles from its source to reach that school foodservice operation (U.S. Department of Defense, 1969).

The 1997 agriculture census showed a decline in the number of small- to medium-size farms, and indicated that farmers received 21 cents of each dollar that Americans spent on food (USDA, 1998 as cited in “Food Costs”). With the number of small- to medium-size farms declining, the trend to corporate ownership of food production farms, vertical integration along the food chain, the survival of the family farm and rural communities—even ecosystems—are of critical concern.

Local purchase of food products provides a way for schools to better connect with their communities, serve quality foods to their students, and offer support for local growers and producers. The purpose of this article is to identify benefits and obstacles related to local purchase, describe pilot projects in schools across the country that are involved in local purchasing, and suggest resources for those interested in learning more about the possibilities for becoming involved in farm-to-school connections.

Benefits. There are many potential benefits for both the school and the local growers/producers when links between them are established. According to school foodservice directors interviewed in Iowa (Gregoire et al., 2000a), benefits to schools include fresher foods, ability to purchase smaller quantities of foods, aiding the local economy, knowing product sources, and good public relations. Positive impacts to local markets include supporting regional economies through retention of revenue or further processing to add value, creating new markets for small- and medium-size farming operations, reducing transportation miles and energy consumption, and serving fresher foods.

Another benefit to directly linking consumers with producers is the increased awareness about food production. As our family farm society has changed to an urban lifestyle, consumers have less knowledge about the origin of their food. Knowledge of the source of food and food ingredients allays concerns many consumers have about the safety of the food they purchase.

Inclusion of locally produced foods in school meals programs offers the opportunity to increase student awareness of food growing and processing systems. This awareness is an important theme in the Team Nutrition curriculum, which includes such lessons as “We Can Grow a Garden,” “Food Grows,” and “Where Do Foods Come From?” (USDA, 1995). Foodservice managers can work with classroom...
teachers to link items served in the dining room with lessons learned in the classroom.

**Successful Connections.** Several efforts across the United States have been made to encourage school foodservice operations to purchase food items from local producers. The majority of these efforts have focused on purchases of fresh produce items, and many have integrated origins of food into the curriculum. Some successful connections have been broader in scope than others that have focused only on one or two schools in a district.

The USDA endorses the concept of farm-to-school programs through its Small Farms/ School Meals Initiative. Workshops in Kentucky, Iowa, and New York have focused on farm-to-school connections. The Community Food Security Coalition supports these efforts and recently published a manuscript that describes successful farm-to-school programs across the country (Azuma & Fisher, 2001).

The Department of Defense (DOD) has become involved in farm-to-school fresh produce programs in North Carolina, Kentucky, and other eastern states through use of its distribution system. For over six years, the DOD's Direct Vendor Delivery Program has helped make greater quantities and varieties of fresh fruits and vegetables available to students. This project began in 1994-95 and continues today. The DOD project purchases produce for schools from local farmers and arranges for distribution. In Fall 1998, over $61,500 of locally grown sweet potatoes, apples, cucumbers, peaches, bell peppers, cabbage, tomatoes, watermelon, alfalfa sprouts, and beans were purchased and distributed by the DOD. (Note: Food Code 99 identified raw seed sprouts as a potentially hazardous food. Approved suppliers for this type of fresh produce item must be used by school foodservice operations.) In North Carolina, the Department of Agriculture and Consumer Services provides grants to school systems to purchase locally grown produce (German, 2000).

The USDA worked with local growers and state agencies in Florida to form a value-added produce-processing cooperative in Northern Florida. The new facility processes locally grown fresh produce into labor-saving products for use in school food production sites. A local county development council helped arrange financing for construction of the packing and processing facility, as well as refrigeration and mechanical cutting equipment. The main product processed is fresh cut leafy greens (washed, chopped, and packaged), but watermelons and strawberries are sold as well. The packaged, leafy greens are delivered to the schools within three days of harvest (Schofer et al., 2000).

Some of California's larger school districts have initiated farm-to-school programs. In 1997, the Farmers' Market Fruit and Salad Bar began with a pilot project, and now is offered at every school in the Santa Monica-Malibu Unified School District (SMMUSD). The success of this program is attributed to effective marketing and involvement by parents and teachers. Nearly 50% of the district's students select salad bar meals rather than the hot lunch. The project coordinator picks up food from the farmers' market twice a week and takes it to the schools. One to three staff members, parents, or volunteers prepare the produce for the salad bar and then another staff member monitors the salad bar at service to ensure compliance with USDA meal standards.

In 1998-99, the average food cost of a farmers' market salad bar meal was $8.77, compared to $8.88 for a hot meal. With a district average of 23% of students qualifying for free and reduced meals, and use of commodity proteins in the salad bar, the SMMUSD foodservice administration considers the fruit and salad bar cost-effective (personal communication, April 27, 2001). In addition, over $25,000 have been spent on fresh produce from local farmers during the school year. Based on the success of the Santa Monica-Malibu program, a similar project was begun at the Ventura School District Middle School. Because of close location between the schools and the farmers' market, deliveries are made to the school twice a week (Azuma & Fisher, 2001).

In August 1999, Berkeley (Calif.) United School District's (BUSD) school board adopted a comprehensive food policy that would ensure no child was hungry, seek to make the cafeteria an extension of the classroom and a learning laboratory, and advocate for service of organic food to the maximum extent possible. This policy articulates many of the concepts presented in the "Edible Schoolyard" garden at one school in the district. (For more information, e-mail edible@laminds.com.)

In May 2000, an organic salad bar was started with the support of parents and district patrons. It has proven to be a great success with students and staff. Today, school foodservice staff report that overall lunch participation has increased—with more than two-thirds of all meals purchased from the salad bar. A coordinator for the salad bar program was hired by BUSD. This individual places orders with six small-scale farmers and picks up the produce at the Berkeley Farmers' Market twice a week (Azuma & Fisher, 2001).

The California climate is conducive to production and year-round supply of fresh produce items. But even in cool weather climates, farm-to-school programs have been successful. One example is Hartford, Conn., a district with more than 24,000 students and 32 schools that implemented a farm-to-school program in 1996. Local farmers sold the schools about 17,495 pounds of product for a total cost of $6,900. In the fall of 1998, a total of 65,355 pounds of local apples, pears, peaches, nectarines, and tomatoes were purchased at a cost of $25,702. Because of the number of schools involved, a broker coordinated the ordering, delivery, and payment functions. Classroom educational activities were based on food experiences and farm visits (Farm Fresh Start, 1997).

Additionally, Vermont has several school districts that initiated curricular efforts based on the use of local and organic foods in the foodservice program. Some of these have included such curriculum-based activities as a school garden. Although such benefits as improved nutrition and increased student awareness of food production have been noted, school foodservice directors have expressed their concerns with the limited budgets and the need for training school foodservice personnel (Meunier, Eisenberg & Kaufman, 1997).

As part of an effort to identify a model to increase purchases of foods from local producers, another farm-to-school project was started in 2000 in Nevada, Iowa. With the help of a graduate student who served as a food broker for 10 local farmers, purchases were made from these growers for items needed for the schools' salad bars. The Nevada Community School District has an enrollment of approximately 1,600 students. School is in operation from mid-August to the end of May.

Although costs for the items in this district were estimated to be 34% higher than purchases made the previous year from...
the prime vendor, actual dollar expenditures represented a very low percentage of the overall food budget (roughly 1% to 2%). A total of $250 was spent on fresh produce from local vendors for the 12-week period, which was an increase of $87 from the previous year. Higher costs for locally grown produce items were explained by differences in production systems. Larger, more established systems are found to benefit from economies of scale, while family farming practices are labor-intensive and distribution systems are still in development.

Evaluation comments received from the Nevada Project team members were that foodservice operators must understand the production end and impact of weather on product availability, and the need to be flexible in terms of menu offerings. Producers realized their need to offer clear communications about their products, and to better understand how a product would be used on the menu. Another recommendation that resulted from the project is the need to have the order and payment processes consolidated through a broker or producer cooperative, rather than individual payments made to each supplier.

Various grant sources at the local and federal level, as well as community alliances, have been key factors in the success of local farm-to-school connections. Another component needed for successful projects is commitment from school personnel and local producers.

Challenges. Some very real obstacles to implementation of farm-to-school programs exist. Not all states have climates conducive to a year-round supply of fresh produce or established DOD distribution systems. School foodservices vary in such ways as district size, number of students served, availability of local resources, purchasing flexibility, financial capability, production methods, compliance with federal meal program criteria, and purchasing manager’s commitment to buying foods from local sources. Interviews with school foodservice directors in Iowa indicated such factors as food cost, package unit consistency, delivery options, reliability of supply, and consistency of quality as potential obstacles to local purchasing (Gregoire et al., 2000a). In addition, food buyers have limited time to work with many vendors, and cannot burden school district offices with payment checks to additional suppliers.

Anecdotal evidence indicates that many farmers’ market customers purchase foods from this source because the food is perceived as safer. And the young ages of their clientele also makes safety a key concern for school foodservice directors. Due to these concerns for safety and an increasing shortage of staff, the purchase form of food often is that which requires minimal onsite handling. Convenience forms of fresh produce, fully cooked meats, and pasteurized processed eggs frequently are purchased. Federal and state guidelines are very specific in licensing requirements for vendors of potentially hazardous foods, yet are less so for fresh produce growers. However, issues related to water and soil quality and pesticide applications have raised awareness about food safety for these products. School districts may require vendor insurance, which could be prohibitive for the small farm producer.

CONCLUSIONS AND APPLICATION

School foodservice directors interested in learning more about successful farm-to-school connections should contact their state agency office, or access the following Web sites:
- Community Food Security Coalition, www.foodsecurity.org
- ISU HRIM Extension, www.extension.iastate.edu/pages/families/hrim

County Extension personnel can serve as excellent resources to help identify local growers and producers with whom school foodservice directors can collaborate.

USDA has partnered with the DOD to provide a delivery mechanism for getting fresh produce from local growers and producers to local schools in North Carolina and Kentucky. Expansion of this partnership to other states could increase the use in schools of locally grown and produced food items. Policies and funding to support local food purchases also are needed.

More research is needed to clearly identify obstacles to local purchasing and develop effective procedures to streamline purchasing and payment functions. Having these data will help to identify ways in which these obstacles can be minimized, as well as promote linkages between schools and local growers and producers.

Work is needed with local growers and producers to help them better understand the needs and constraints of school foodservice operations. A recent Iowa State University Extension publication (Gregoire et al., 2000b) offers tips to local growers to facilitate the farm-to-school connection.

School foodservice directors continue to be challenged to find ways to offer healthful, nutritious foods to the children they serve. Linking with local growers and producers provides a way to help meet this challenge.

ACKNOWLEDGEMENTS

The authors acknowledge support received from the following organizations: Iowa State University Value-Added Agriculture Extension, The Leopold Center for Sustainable Agriculture, Community Food Security Coalition, the Occidental College Food Security Program/School Initiative, and Practical Farmers of Iowa.

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Barriers to Healthy Nutrition Environments in Public School Middle Grades

Mary Kay Meyer, PhD, RD; Martha T. Conklin, PhD, RD; Jerry R. Lewis, EdD; John Marshak, PhD; Sherri Cousin, PhD; Casey Turnage, MS, RD; and Dean Wood, Med

Nutrition is important to children of all ages, however, it is extremely important for children in middle grades who experience great changes in their physical and psychological development. Due to the fact that these children experience rapid growth and are particularly vulnerable to outside pressures during these years, it is critical to provide them with a healthy nutrition environment. Because adolescent nutrition is important, a focus group research project was developed to determine the status of nutrition environments for public school middle grades nationwide.

Eighteen focus groups were conducted in three strategically selected locations throughout the country. Three sets of focus group participants included school principals and superintendents (school administrators), teachers and coaches (educators), and foodservice managers and directors (foodservice administrators). Three teams of moderators and assistant moderators conducted the focus groups.

The constant comparative method of analysis was used to organize research findings (Glaser & Strauss, 1967). In the analysis, researchers read each quotation to see if it either fit into one of the identified categories or if it should be placed into a new category. A new category was created when a quotation did not fit into an existing category.

The analysts looked at the frequency and extensiveness of comments, words used, intensity of the comments, and the specificity of the comments. If a comment described something previously identified, then they categorized it with the earlier quotations. Once the specific categories were identified, a summary statement was written to illustrate how participants talked about these categories. Quotations were pulled from the transcript to illustrate the categories.

Results showed that participants did not feel middle-school environments were conducive to healthy eating habits. Vending machines and a la carte sales of unhealthy food items received much discussion. The participants gave many examples of mixed messages concerning a healthy nutrition environment. The major barriers identified to having a healthy nutrition environment in middle grades were as follows: lack of time; funding; physical environment; menu and menu choices; competitive foods; lack of commitment by school administrators, the community and parents; and outside influences.

Local school administrators, teachers, parents, community members, students, and school foodservice personnel should work together to break down the barriers causing a poor nutrition environment in our middle grades. The results of these focus group discussions are reasons for all constituents to pause and reflect on what matters most and how healthful eating practices among middle school students can be achieved.

Healthy eating is important. It helps children grow, develop, and perform well in school. Healthy eating assists in preventing such childhood and adolescent health problems as obesity, eating disorders, dental caries, and iron deficiency anemia. It also lowers the risk of such chronic diseases as heart disease, stroke, diabetes, and cancer, and reduces potential health care costs (USDA, 2000). However, today's school environment contains many conflicting factors, such as competitive foods, snack bars, long lines, and short lunch periods, which compete with creating a healthy nutrition environment (Cullen et al., 2000; Gilmore & Dana, 1997; Story, Hayes, & Kalina, 1996; Brown, Law et al., 1972; Sullivan & Shanklin, 1985).

Although the school nutrition environment is important
for all students in grades K to 12, this research focused only on middle school environments and how middle-grade students are developmentally ready to make important choices in life. The rationale for the focus on middle-grade students and educators in this research is based on several concepts. Students in middle grades are at an awkward stage in life. Ages 10 to 15 span from pre-pubescent to pubescence and from pre-adolescence to adolescence. Educators must be responsive to the developmental needs of these young people, as the academic achievement of these students is highly dependent upon such developmental needs as adequate nutrition (National Middle School Association, 1998; Carnegie Council, 1996).

Changes in patterns of thinking and learning are quite evident in this age group. This represents an opportunity to instill eating habits that last into adulthood (Carnegie Council, 1989). Even good habits that began at home and were developed in the elementary grades are scrutinized and questioned at this stage of development, due to peer pressure and efforts to become independent thinkers (National Middle School Association, 1998). Health practices of this age group often are inappropriate, especially in relation to the diets needed to meet the nutrient needs of changing bodies. Rapid physical changes combined with the multiple hazards of contemporary life make this a critical period for healthy personal growth and development (George & Alexander, 1993; Carnegie Council, 1996).

Additionally, the economy directly affects children, especially middle-school students. A substantial number of young people have a considerable amount of disposable income, which makes them major targets for marketing campaigns. Also, young people in middle school are remarkably clannish due to peer pressures. It is important to understand that this is a defense against a sense of identity confusion (George & Alexander, 1993).

Focus groups are qualitative research methods that generate a rich understanding of participants' experiences and beliefs (Morgan & Krueger, 1998). Focus groups have been used in nutrition and health education research to assess beliefs and attitudes, design educational materials, evaluate educational programs, and design surveys. Crockett, Heller, Merkel, and Peterson (1990) used focus groups to understand the attitudes and behaviors related to nutrition education. Pryor (1996) incorporated focus group discussions with parents to assess if a parent involvement in their child's school leads to a better educational experience. Lambert (2000) used focus groups with parents to determine their behavioral intentions to encourage their elementary school-aged children to participate in the National School Lunch Program. Meyer, Conklin, and Carr (1997) used focus groups in the development of survey questions for the NFSMI High School Foodservice Survey.

Because of the importance of nutrition in the development of adolescents and the uncertain nature of the nutrition environment in middle grades nationwide, a focus group research study was developed to answer three questions.

1. What is the nature of the nutrition environment in the middle grades in U.S. schools?
2. Which elements of a school's nutrition environment are most relevant to students' health and well-being?
3. What steps can be taken to increase the awareness of the school nutrition environment and the promotion of healthy eating behaviors of students in middle grades?

In this study, a healthy nutrition environment was defined as one in which healthy eating behaviors are encouraged.

**METHODOLOGY**

Focus groups allowed researchers to explore the socio-environmental, behavioral, and attitudinal dimensions of this issue without imposing predetermined boundaries. The Focus Group Kit, developed by Morgan and Krueger (1998), was used as the basis for the development of the research design. Dr. Richard Krueger, University of Minnesota, served as a consultant on the project.

Three focus groups were held simultaneously with school administrators (principals and superintendents), educators (teachers and coaches), and foodservice administrators (directors and managers). All participants were involved with middle school programs. These three groups were selected because they represented the types of individuals who are able to keenly observe the school nutrition environment. In addition, individuals in these roles often are deemed influential in making changes related to the school nutrition environment.

**Strategies.** Twenty-seven state child nutrition program directors were contacted to solicit names of foodservice administrators who might be available to participate in a focus group. Similarly, the state association of school administrators was contacted to solicit candidates' names for representation of school administrators in the focus groups. School Web pages on the World Wide Web also were used to search for educator participants. Although participating states had representation in each of the focus groups scheduled at a regional site, no attempt was made to match participants from the same school district.

The field research team consisted of six individuals. Two members of the research team were present in each focus group, one serving as a moderator and the other serving as an assistant moderator/recorder. Three moderators were selected because of their familiarity with the job responsibilities of the target audience, and all were advanced graduate students in Educational Leadership and Research.

The team, along with Dr. Richard Krueger, worked together to develop standard protocol for introducing and moderating the focus groups. This was done to ensure uniformity in how the focus groups were conducted, and to allow for comparability across the focus group sites. The focus group sessions occurred at three sites throughout the United States: Kansas City, Mo.; Las Vegas, Nev.; and Reston, Va. These sites were strategically located for ease of travel in the east, west, and middle of the country. There were a total of 18 focus groups, three of which were held simultaneously during the morning and afternoon at each of the three sites. Approximately 27 people participated at each site.

The morning sessions were held with foodservice administrators, school administrators, and educators in separate groups. A series of questions was asked, which led to the identification of the barriers to having a healthy nutrition environment in middle grades. In each of the three afternoon sessions, participants comprised a mixture of various middle school personnel (school administrators, educators, and foodservice administrators), who attended the previous sessions. These focus groups were designed to explore possible discontinuity between responses of the homogeneous groups and responses elicited from the heterogeneous groups. The Journal of Child Nutrition & Management, 25(2) 2001
Table 1. School districts' characteristics of participants in the study of middle-grade nutrition environments (N=77)

<table>
<thead>
<tr>
<th>School District Characteristics</th>
<th>Number of Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foodservice personnel are involved in nutrition education in the middle grades.</td>
<td>31</td>
</tr>
<tr>
<td>Nutrition is included in the curriculum in middle grades.</td>
<td>73</td>
</tr>
<tr>
<td>There is a comprehensive health curriculum that includes nutrition in middle grades.</td>
<td>60</td>
</tr>
<tr>
<td>The school board has a policy dealing with contracts for food/drink items with vendors.</td>
<td>37</td>
</tr>
<tr>
<td>Schools serve middle grades with vending machines.</td>
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</tr>
<tr>
<td>All</td>
<td>42</td>
</tr>
<tr>
<td>Some</td>
<td>24</td>
</tr>
<tr>
<td>None</td>
<td>10</td>
</tr>
<tr>
<td>Schools serving middle grades with school-sponsored stores.</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>17</td>
</tr>
<tr>
<td>Some</td>
<td>27</td>
</tr>
<tr>
<td>None</td>
<td>32</td>
</tr>
</tbody>
</table>

groupings. These groups also were asked to address strategies for improving the school nutrition environment.

Data were gathered from notes taken by the assistant moderators and transcriptions of the 120-minute audio taped focus group discussions. The constant comparative method of analysis was used (Glaser & Strauss, 1967). As soon as the research team read each transcript once in order to gain an overall feel for what was said across the groups, they began categorizing the comments.

Once categories were identified, a summary statement was written to illustrate how participants talked about the given categories. Quotations were pulled from the transcript to illustrate the categories or themes. The analysts looked at the frequency and extensiveness of comments, words used, intensity of the comments, and specificity of the comments. In the analysis process, the researchers read each quotation to see if it fit into one of the categories identified by the researchers, or if it belonged in a new category. A new category was created if it was different from what had already been seen.

The research team took a number of steps to ensure that the results were a valid reflection of what the participants thought about the school nutrition environment. A team of people with diverse backgrounds conducted the research so that different perspectives would be represented. Prior to the focus groups, questions were pilot tested and modified. The pilot group was composed of foodservice administrators, educators, and school administrators. The research team was trained to conduct focus groups, during which time the moderators sought clarification from participants when responses were unclear. The research team used systematic procedures for data collection and data handling for the audio taping and transcribing of each session. After the focus groups, the team discussed similarities and differences among groups. The analyst worked with another moderator during the analysis process. All moderators were asked to review the report of the findings for validity. This is accepted focus group research protocol (Krueger, 1998).

RESULTS AND DISCUSSION
The goal of 81 participants (nine of three types of participants in each of the three locations) was not met due to scheduling and unforeseen cancellations. The study involved 77 participants: 26 school administrators, 24 educators, 25 foodservice administrators, 1 nurse, and 1 school coordinator. These participants represented 28 states. The majority were from 25 suburban areas, but 13 rural and small towns and 10 urban areas also were represented. The remaining districts represented a combination of these classifications. Thirty-eight of the partici-

pants had more than 17 years of expertise in their field, and 29 had between five and 16 years of experience.

The size of the school districts represented in this study ranged from 168 to 218,000 students. Participants were asked to complete a school district information sheet prior to arriving for the focus group.

Table 1 summarizes the characteristics of the participants' school districts, and Table 2 shows the frequency and type of snack items sold in vending machines and school-sponsored stores of represented school districts. Of the schools represented, 59 reported having some a la carte sales. The most popular items sold were pizzas, French fries, chips, cookies, and chicken tenders/nuggets.

Two key questions were asked in the morning session: "What are the barriers to promoting healthy eating behaviors in your school?" and "Occasionally, organizations within a school send mixed messages about the nutrition environment. Please give me one example of this in your school." Mixed messages were defined as, "Say one thing and do another." The following is a summary of the responses for all focus group sessions to these two questions.

**Question 1: What are the barriers to promoting healthy eating behaviors in your school?** On the card you have, list three barriers that impede healthy eating behaviors within your school.

- Money was the most commonly mentioned barrier by all three groups. The issue appears to be divided into several areas. (A) The first area is revenue generated from the sale of non-nutritious foods. For the foodservice program, the a la carte items—often chips and cookies—are necessities to operate in the "black." According to the foodservice administrator, "To make money we have to sell a la carte (junk) food. I think we are part of the problem." The club’s sponsors perceive the sales revenue of such items as candy as an easy addition to their budgets. Administrators viewed concession stand and vending machine profits as supplements to local funding allocations.

- (B) The second area is the money students possess to make purchases. Even students eligible for free and reduced-price meals have money to purchase the less-healthy food items from vending and a la carte offerings. In some loca-
tions, there is a social stigma associated with having to eat in the "regular" lunch line. Not all schools have been able to overcome the difficulties of differentiating between those students on free and reduced priced meals and those who are not. Therefore, students who qualify for free and reduced meals often do not eat the regular meals.

**Cafeteria Atmosphere**, or dining area atmosphere, was the second most-noted barrier. Participants noted long lines, outdated facilities, and overcrowded conditions as not being conducive to students making good eating decisions. As a result, students skipped meals or ate foods from vending machines. Some focus group participants shared that changes in furniture and serving areas in the cafeteria itself have made significant differences. According to one foodservice administrator, "You may have adequate money to cover preparation costs, labor costs, and food supplies, but if you need to update the environment, you need better equipment, the kind the kids see in the fastfood restaurants, instead of the long lines of the stereotypical school foodservice serving line. To get that type of setting it takes dollars, and there is nobody that is going to give it to you."

**School Policy** was next in rank order. Since most school systems did not have a policy on nutrition, except as it related to the health and physical education curriculum, teachers did not see a need to make it a priority. Instead, emphasis is placed on standardized testing. As one school administrator points out, "We are starting to publish test scores in the newspaper and that is putting a squeeze on anything that is not going to be published. Electives are being eliminated, and we do not have a health class and will not get one."

The teaching of technology already has reduced the instructional time for non-language and math classes. Only one educator stated that his/her district had a policy that affected the curriculum on developing healthy eating habits. "We have the New York State Assessments, the kids have tutorials and all kinds of study sessions that take place during lunch, so kids don’t eat, they just don’t eat."

**Food Choices**. Limited cafeteria choices also were of concern, and participants frequently characterized the food as poor in quality, greasy, tasting artificial, and lacking visual appeal.

With today's social pressures, the main goal often is just to have some type of food on the table. "They don't care what they are eating as long as the kid says, 'Yes, I ate lunch,'" reports one educator. Additionally, claims a foodservice administrator, "Parents expect us to feed them good choices, but at home they give them fast foods for rewards. But, we are supposed to be the bad guys and enforce nutrition."

**Curriculum**. The last barrier is curriculum. Only a few participants—generally health and physical education teachers—took the topic of nutrition. Says one school administrator, "Advertising may raise awareness, but knowledge is what will produce the best choices in the long run."

**Summary of Responses**. The following is a summary of the responses for all focus group sessions to the second key questions asked during the morning groups. Quotations are identified according to the group providing the information.

**Question 2**: Occasionally, organizations within a school send mixed messages about the nutrition environment. Please give me one example of this in your school. (Mixed messages=say one thing and do another.)

**Rewards**. Participants nationwide noted that the number one mixed message was the reward system that is ingrained in schools. According to participants, teachers, PTA members, and administrators all are guilty. They often reward children with non-healthy treats. They gave several examples to include the following: pizza parties, at which time pizza would be ordered from a commercial restaurant and the students would not eat the school meal that day, thus not receiving a balanced meal) or ice cream parties for good grades, good conduct, or good attendance; reading competitions that were linked to pizza parties; selling candy for a trip to Mexico; using vending machine money to support student activities, giving children cookies after a state exam or when the results come in; and teachers using candy to reward academic progress or during activities or games.

As one educator points out, "The mixed message is we want children to eat well, and we want them to know their basic choices and what is important for their bodies, but we are not giving it to them. Their parents aren't giving it to them. Neither the teachers nor the PTA are promoting it. Instead, they are giving parties, rewards, and..."
Research in Action

treats." And another educator reiterates similar problems. "We teach about obesity in health class, but every reward they get is pizza, ice cream, and cookies."

- Vending machines. The second leading mixed message was vending machines. Participants raised several concerns here. First, they stated that vending machines are a blatant contradiction to any nutritional eating program because the choices in these machines are unhealthy. "We say eat healthy, but we are selling unhealthy items," explains one school administrator.

Further, participants expressed sincere concern and frustration over the link to vending machines and the survival of existing programs—extracurricular activities in particular. "Economics plays a part in all this...the sports teams get money from the vending machines.... If you don't have enough money to run your programs the economics takes over versus the nutrition of items for students," reports one school administrator. Thus, the concerns over nutrition are overridden by financial concerns and program longevity.

Participants also commented on the fact that the vending machines can be automatically turned on and off, but that they are usually only turned off during lunchtime. In other words, this is not done for the well being of the students, but for financial reasons. The foodservice department does not want the competition.

- Snacks/A la Carte. A a la carte items emerged in every session and within every state represented at the focus group sessions. The main concern was that a a la carte menus serve a lot of non-nutritious choices, including brownies, cookies, chips, snack cakes, fruit-flavored drinks, sodas, pizzas, and other snack foods. In addition, another concern was raised addressing the idea that many students fill up on a a la carte foods, without eating anything that is remotely nutritious. As one school administrator reports, "I think that a a la carte menus deter healthy eating, and kids are filled up even before lunch begins because they are filled up on junk food."

Participants voiced frustration and gave the groups a reality check, acknowledging that they have to sell these types of items. In other words, foodservice programs are under great pressure from the competition and school boards, and are forced to keep their foodservice programs financially successful, or "out of the red." "We are forced to sell those things because of competition. I give out free pop," admits one foodservice administrator. And another foodservice administrator reports, "I sell junky stuff to make money."

- Teachers. Participants noted the following objections to teacher behavior that negatively influenced the school nutrition environment: not eating in the cafeteria; ordering out for lunch; bringing lunch from home; having too many parties in their classrooms; walking through the halls eating "junk" food; providing donuts for teachers; and having vending machines in the teachers' lounge. "We have juice machines for the students, but soda machines in the teachers' lounge," points out one educator.

- Fundraisers. Many sports programs are supported through fundraisers that typically sell candy. Also, the Parent Teacher Organization (PTO) has bake sales to support the programs. Therefore, according to one foodservice administrator, "We are forced to compete for funds... If we weren't forced to compete, maybe we wouldn't sell those things."

- Menus/menu choices. The school menu and menu choices do not always reflect a healthy balance of choices. One educator points out, "We say that all our kids are getting balanced meals, but 50 percent eat corn dogs and French fries for lunch." And another educator is quick to reiterate the lack of food choices. "We tell them you must eat this, this many times a day, but we don't even give them the choices to eat it when they go through the lunch line."

- Coaches. Teachers felt that coaches should be more nutrition oriented. Concerns were expressed regarding coaches, wrestling coaches in particular, and their weight-reduction programs. "Coaches should be more nutrition oriented than any other teacher in the school, but they support concession stand sales because it raises money for them," says one foodservice administrator.

- Breakfast for testing. According to some participants, breakfast programs are only implemented at or around testing days. The consensus was that students need adequate nutrition every day, not just on testing days.

- Miscellaneous. Participants were concerned that food items, especially milk, were being discarded because students did not want the items, but were told they must take them. Participants questioned the regulations concerning this practice.

CONCLUSIONS AND APPLICATION

Results showed that school administrators, educators, and school foodservice administrators did not think the environments in middle grades were conducive to healthy eating habits. Vending machines and a la carte sales of unhealthy food items received much discussion. Participants gave many examples of mixed messages concerning a healthy nutrition environment. Major barriers to having a healthy nutrition environment in middle grades were identified, including: lack of time; funding; physical environment; menu and menu choices; competitive foods; lack of commitment by school administrators, the community, and parents; and outside influences, such as the media.

Local school districts and communities can have a great impact on these barriers. To eliminate these barriers, all parties must focus on the student as our primary customer. Local districts could form interdisciplinary teams and partner with the community to assess their school's nutrition environments and develop plans for enhancement. They also can establish a nutrition policy, which would provide adequate time for students to eat meals, regulate the types of products placed in school vending machines, eliminate competitive foods, and encourage teachers and administrators to be involved in the school foodservice and nutrition program.

Additionally, local districts can provide a comprehensive nutrition curriculum to equip students with the knowledge and skills to make healthful food choices and set a foundation for lifelong healthy eating. Individual schools should take charge and ensure financial decisions do not undermine nutrition goals. Teachers and administrators can teach by example and serve as role models for students. Healthy eating skills can be incorporated into the existing curriculum. School administrators can schedule meals when students are hungry and allow adequate time for meals to be served and eaten. Food should be eliminated as a reward and other incentives used in its place, such as movie tickets.

Moreover, the foodservice administrators should ensure that a la carte foods offered contribute to healthy eating patterns.
They should work with the school administrators to provide healthy snacks in vending machines, snack bars, and school-sponsored stores. Adequate dining space and a pleasant ambiance should be provided for all students. By having adequate space and adequate serving lines, the time students wait to be served could be minimized and the dining experience enhanced.

The results of these focus group discussions are reasons for all constituents to pause and reflect on what matters most and how healthful eating practices among middle-school students can be achieved. A giant step toward an improved school nutrition environment was made when the focus group participants were willing to admit their role in this problem. The next step is for school foodservice administrators to work with school administrators, teachers, parents, community members, and students to promote a healthy school environment.

ACKNOWLEDGEMENTS
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REFERENCES

Food Handling Knowledge and Practices of 4th- and 5th-Grade Students: A Key to Better Sanitation

Martha Barclay, PhD, RD, LD; Karen Greathouse, PhD, RD, LD; Theresa North, PhD; and Lynette Cale, MS

Food safety is an increasing concern to the American public. Foodborne diseases cause an estimated 76 million illnesses per year in the United States, making it a noticeable and costly problem (Mead, Slutsker, Dietz, et al., 1999). Most foodborne illnesses originate from unsafe food-handling practices in the home. This research examines food safety knowledge and food-handling practices of 4th- and 5th-grade students. A 15-item questionnaire was developed, pre-tested, and used to collect data from 709 4th- and 5th-grade students in seven area schools in West Central Illinois. Frequencies and chi-square analyses were used to analyze the data. The most frequently reported unsafe practices included eating raw cookie dough, tasting foods during preparation, licking fingers while eating, drinking beverages left by family members, and eating food left by family members. Significant differences were observed between 4th- and 5th-grade students, as well as between male and female students.

According to the From Farm to Table: National Food Safety Initiative developed by the Food and Drug Administration Center for Food Safety and Applied Nutrition (1997), the incidence of foodborne illness remains high due to a lack of understanding of safe food practices by food handlers as food passes from growers to processors to the consumer's table. The consumer is an integral part of the chain. To reduce the incidence of foodborne illness, President Clinton announced a $42 million Food Safety Initiative in his radio address to the nation in January 1997. The Food Safety Initiative was designated as part of the budget for education. In order to reduce practices that may be related to foodborne illness, it is necessary to effectively educate food handlers.

Previous research on home food-handling practices has identified specific audiences for education. A summary (Knabel, 1995) of the role of food-handling practices in foodborne illness identified societal changes, such as changes in family structure and the increased use and availability of convenience foods, which may have led to a decline in the extent of training individuals receive in proper food handling. A survey of adults ages 18 to 65 years and older, conducted by Williamson, Gravani, and Lawless (1992), indicated that participants age 35 and younger had the lowest level of knowledge on safety practices. In addition, men were less likely than women to use safe food-handling practices. Since those under 35 years of age appear to have had less training about safe practices than the adults over 35 years, it is appropriate to target research toward children while they are still forming food handling habits, as well as to ascertain the optimal age at which to intervene with food-handling education.

Today, American children are more involved in and responsible for their food decisions. This partially is due to the fact that more mothers work outside of the home than in the past, resulting in less time to shop and prepare meals. This means that children must learn how to prepare meals and shop for food at an earlier age (Crockett & Sims, 1995). The results of a questionnaire given to 80 boys and girls ages 9 to 12, who belong to a 4-H Club, indicated that while 88% of the children were involved in food preparation, only 45% washed their hands prior to starting (Byrant & Barrett, 2000). In the same study, the children also failed to wash their hands more than 50% of the time after using the bathroom or petting animals. Finally, while 70% of the children surveyed knew what food safety meant, the vast majority did not know about foodborne illnesses, cross-contamination, internal temperatures, or using thermometers.

According to Fein, Jordan-Lin, and Levy (1995), the severity of foodborne illnesses and their causes should be strongly emphasized along with the consumers' role in decreasing the incidence of foodborne illnesses. Without

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proper education regarding nutrition and food safety, children are not able to make informed decisions.

The USDA/FDA Education Initiative and the National Food Safety Initiative realize the importance and need for food safety education in the public school system (Koeppl & Robey, 1998; Food and Drug Administration Center for Food Safety and Applied Nutrition, 1997). Upon review of the current food safety education materials available, and of which grades achieved the best results, the Education Initiative cited middle school children as the best choice to target (Koeppl & Robey, 1998). Middle school children are at an ideal age to learn about food safety. Young children may not have developed lifelong food-handling and personal-hygiene habits yet; therefore, education at an early age will have both short and long-term benefits (Koeppl & Robey, 1998). Also, peer influence plays less of a role during the middle school years (4th- and 5th-grade) than during the junior high and high school years.

The purpose of this study was to examine the frequency of unsafe food-handling practices among 4th- and 5th-grade students in West Central Illinois public schools. Specific objectives included assessing differences in safety practices between 4th- and 5th-grade students and between male and female participants.

METHODOLOGY
A survey instrument was developed at Western Illinois University (WIU) to identify 4th- and 5th-grade students' food-handling knowledge and practices. It was pilot tested with 28 students in these grades. The instrument was reviewed by WIU's Human Subjects Committee and modified according to the Committee's recommendations. The final instrument consisted of 15 items regarding food-handling practices, to which respondents indicated their personal practices with yes/no responses. The survey also obtained demographic information, including school grade and gender.

Researchers delivered copies of the survey to seven schools in West Central Illinois with instructions to teachers for administering the survey. Before collecting data, teachers dispensed and collected parental consent forms. Teachers described the study to the 4th- and 5th-grade children whose parents had completed consent forms and were allowed to participate in the study. Teachers collected completed surveys and researchers picked them up in the school administrative offices.

The SPSS version 8.0 was used to analyze the data. Frequencies for food-handling practices were calculated. Chi-square analysis was used to discern initial differences. Since a significant difference was noted among the seven schools, multivariate analysis was used to analyze differences between male and female students and between 4th- and 5th-grade students, using the school as the covariate.

RESULTS AND DISCUSSION
There were 709 students who completed the questionnaire. The sample included 341 females and 368 males. The total enrollment of those classes participating was 718 representing a return rate of 98%. The 2% of students who did not participate in the study were absent the day of the survey.

Frequencies of occurrence of the food-handling practices are summarized in Table 1. The most frequently cited practices were eating raw cookie dough and other products with raw eggs, tasting food during food preparation at home, licking fingers while eating, drinking beverages left by family members, and eating food left by family members. Each of these practices were reported in high percentages ranging from 71% for eating cookie dough to 31% for eating foods left by a family member. Less frequent practices involved such safe handling of specific products as washing fruits and vegetables, eating non-referigerated puddings and sandwiches, eating raw or rare ground beef, and licking fingers while preparing such foods as pudding.

Significant differences were seen in several practices between male and female students (Table 1). Male students reported significantly higher incidences of unsafe food practices in all cases, including tasting raw cookie dough and other foods while being prepared, licking fingers while eating, eating unwashed raw fruits and vegetables, eating leftover non-referigerated puddings, eating leftover non-referigerated sandwiches, and drinking beverages left by other students.

When significant differences occurred between the two grades studied, 5th-graders reported a higher incidence of unsafe practices. Reported practices that were significantly higher for 5th-graders included tasting food being prepared at home, drinking beverages left by other students, and eating food left by other students. These last two behaviors may be related to the beginning of adolescence when peer relationships become more important to students. In addition, as children age they begin to purchase or prepare more foods for themselves and, hence, need more educa-

<p>| Table 1. Percent of total, male, female, 4th- and 5th-grade students reporting unsafe food practices |</p>
<table>
<thead>
<tr>
<th>Practice</th>
<th>Total</th>
<th>Total Male</th>
<th>Total Female</th>
<th>4th</th>
<th>5th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eat raw cookie dough</td>
<td>71</td>
<td>73*</td>
<td>69</td>
<td>73</td>
<td>70</td>
</tr>
<tr>
<td>Taste foods being prepared</td>
<td>57</td>
<td>60*</td>
<td>53</td>
<td>53</td>
<td>61*</td>
</tr>
<tr>
<td>Lick fingers while eating</td>
<td>54</td>
<td>58*</td>
<td>51</td>
<td>54</td>
<td>55</td>
</tr>
<tr>
<td>Drink beverages left by family member</td>
<td>37</td>
<td>38</td>
<td>35</td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td>Eat food left by family member</td>
<td>31</td>
<td>30</td>
<td>31</td>
<td>32</td>
<td>29</td>
</tr>
<tr>
<td>Lick fingers while preparing food</td>
<td>27</td>
<td>26</td>
<td>28</td>
<td>28</td>
<td>27</td>
</tr>
<tr>
<td>Eat raw fruits/vegetables unashed</td>
<td>16</td>
<td>23*</td>
<td>10</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>Eat leftover pudding unrefrigerated</td>
<td>11</td>
<td>13*</td>
<td>8</td>
<td>9</td>
<td>12</td>
</tr>
<tr>
<td>Eat leftover sandwiches unrefrigerated</td>
<td>8</td>
<td>12*</td>
<td>0</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Eat raw or rare ground beef</td>
<td>6</td>
<td>7</td>
<td>0</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Drink beverages left by students</td>
<td>4</td>
<td>7*</td>
<td>0</td>
<td>0</td>
<td>8*</td>
</tr>
<tr>
<td>Eat food left by other students</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>5*</td>
</tr>
</tbody>
</table>

*Indicates a significant difference at p ≤ 0.05
CONCLUSIONS AND APPLICATION

Results of this study clearly indicate a need for safe food-handling education in the primary grades. Although the majority of children reported washing their hands before eating, this number should be 100%. In addition, there is a need for education on more subtle instances of handling specific foods, such as eating raw cookie dough, washing raw fruits and vegetables, and refrigerating such products as pudding and sandwiches. These topics may be addressed in the science curriculum where microbial growth can be explained.

The study also suggests that the optimum time to introduce food safety in the curriculum may be before the 5th grade. The decrease in compliance between the two grades suggests that although students may know the principles of safe food handling as they move toward adolescence, they may begin to question parental rules. Children may have been taught food safety rules at a young age without explanation of the reasons for the rules. By 3rd and 4th grade they would be ready to understand why those principles are important to their health. Results also suggest that boys are less compliant regarding safe food handling than girls. Curriculum materials and strategies may need to be targeted to boys' special interests. Case studies of foodborne illness outbreaks in situations of close contact such as team sports or military groups might be beneficial.

Teachers and lunchroom personnel also may need instructions on the best ways to model appropriate food-handling behaviors. Allowing children to observe safe food-handling practices in the lunchroom and kitchen would be appropriate reinforcement of principles. In addition, schools need to be responsible for providing a proper environment for safe food handling. The 4th- and 5th-grade students surveyed in our study showed that 32% of them wash their hands before eating, while 177 students do not. Proper handwashing should be reinforced at all grade levels. Perhaps younger, primary children should be taken to wash their hands before lunchtime. Soap and disposable hand towels should be available in all lavatories.

Proper handwashing was shown to sig-
ificantly reduce sick days due to respiratory illnesses by 24% and upset stomachs by 51% in a study of 305 Detroit school children conducted by Dr. Susan Longe (as cited in Renner, 2000). Proper handwashing, along with education, is facilitated by a new design in the washrooms and sinks. According to Renner (2000), new technology and designs have created washrooms and sinks that minimize the amount of bacteria exposure and vandalism to equipment and supplies while increasing students’ accessibility and teachers’ ability to monitor handwashing. One of the most popular designs incorporates a common hand-washing area, known as the corridor concept, which is located outside of the bathrooms in plain view for the teachers. There are no doors or faucet handles to touch, thus reducing the contact with bacteria. Electronic faucets and built-in trash cans without lids also aid in reducing the amount of bacteria to which students are exposed by touch, in addition to saving water, reducing vandalism, and helping keep the facilities clean.

Finally, data suggest that children may be appropriate vehicles if seeking a way to share safe food-handling principles with parents. Many primary grade school children’s parents would be in the age category of less than 35, an age group shown to have less food safety knowledge than adults over 35 years old. The information that children learn at school might be put into a format that could be sent home, as a means of helping parents understand the importance of safe food handling, thus reinforcing these principles.

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REFERENCES

African-American Adolescents’ Food Choices and Perceptions of Future Health Status

Jana R. Kicklighter, PhD, RD; and Michelle D. Broussard, MS, RD

Adolescence is a time of extensive physical, cognitive, emotional, and social change. Attitudes about nutrition and behavioral patterns of diet and physical activity developed in childhood often crystallize in adolescence and persist through adulthood. African-Americans experience a higher prevalence of several major health problems, including obesity and hypertension, than many other ethnic groups, thus making African-American adolescents a prime target group for health-promotion interventions. The purpose of this study was twofold: to assess African-American adolescents’ perceptions about factors influencing their current food choices and eating behaviors, and how these behaviors might impact future health status. The subjects were 24 adolescents from an inner-city church between ages 14 and 19. A moderator conducted four focus groups with six members in each group, and each focus group lasted approximately 45 minutes. All interviews were audio taped and transcribed verbatim. A transcript-based analysis was used to analyze content for the focus groups. Key words, phrases, and quotations were examined to identify emerging themes.

The factors that most influenced food choices among African-American adolescents were parental influence, taste, time constraints, body image, food availability, peers, television, and situational factors. Findings from this study suggest that influences on African-American adolescents’ food choices are similar to those of other adolescent groups. Results indicate that a nutrition intervention that stresses future health outcomes would be ineffective, especially for the younger adolescents because these participants had difficulty accepting their future health status. The Social Cognitive Theory is suggested as an appropriate model for the design of a developmentally appropriate and culturally sensitive nutrition intervention for these adolescents. Ideas for school nutrition professionals to incorporate into the cafeteria and school setting also are provided.

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Adolescence is a time of extensive physical, cognitive, emotional, and social change. Dietary and physical activity patterns developed in childhood often crystallize in adolescence and persist in adulthood (Langer & Warheit, 1997; McNutt et al., 1997; Neumark-Sztainer, Story, Perry, & Casey, 1999). Poor eating habits and physical inactivity during the adolescent years are associated with adult morbidity and mortality (Ozer, Brindis, Millstein, Knopf, & Irwin, 1998). For example, overweight adolescents are more likely to be overweight as adults (U.S. Department of Health and Human Services, 1988).

Research substantiates the disparity in the health status of minority populations compared to that of the majority population. African-American women experience a higher rate of obesity and its medical consequences than do European-American females (U.S. Department of Health and Human Services, 1988). This ethnic difference also is descriptive of children and adolescents (Troiano & Flegal, 1998). The adolescent period offers an opportune time for early interventions to prevent the development of unhealthy eating behaviors and promote the establishment of life-long healthy eating patterns (Story, Neumark-Sztainer, Ireland, & Evans, 2000).

Resnicow et al. (1999) conducted focus groups with inner-city, overweight, African-American adolescent females and found a need to improve their knowledge of the fat and calorie contents of foods and to increase their consumption of fruits and vegetables. However, knowledge of factors that influence the eating behaviors of socio-economically and ethnically diverse adolescent populations is limited (Neumark-Sztainer et al., 1990), and interventions aimed at modifying adolescent eating behaviors have met mixed success (Contento et al., 1995).

Much attention has been focused on eating disorders, but relatively few studies have examined factors that influence more typical eating behaviors across the adolescent population (Cusatis & Shannon, 1996). Contento et al. (1995) suggest the need for studies to assess the ethnic-specific nutrition-related needs, motivations, and concerns of adolescents and recommend the use of qualitative research with this population.
The aim of this study was to assess African-American adolescents’ perceptions about factors influencing their food choices and eating behaviors and how these behaviors might impact their future health status. Focus groups were used for data collection to help the adolescents generate ideas and explore and clarify their views. Focus groups allow participants to share experiences, opinions, and attitudes via group interaction (Betts, Baranowski, & Hoerr, 1996; Krueger, 1994). Qualitative research methodology has proven to be an effective method for several reasons: to gather information about food-choice processes among different target groups and for assessing nutrition-related beliefs and attitudes (Falk, Bisogni, & Sobal, 1996; Neumark-Sztainer et al., 1999); to design nutrition-education messages and materials (Borra & Earl, 2000; Shepherd, Sims, Davis, Shaw, & Cronin, 1994); and to develop and evaluate nutrition education programs (Kicklighter, Mullis, Mohr, Benardot, & Gordon, 1997; Schwaller & Shepherd, 1992).

**METHODOLOGY**

The study included 24 male and female African-American adolescents ranging from ages 14 to 19. Participants were volunteers from a church in the inner city Atlanta area who represent diverse socioeconomic backgrounds. Their parents’ or guardians’ salaries ranged from $35,000 to $250,000 per year. Procedures for planning, executing, and evaluating the focus group interviews were based on key references in the literature (Betts, Baranowski, & Hoerr, 1996; Krueger, 1994).

Four focus groups were conducted with six participants in each. The participants were divided into groups by age and gender. The age groupings were ages 14 to 15 and ages 16 to 19, with 12 each of males and females. The focus groups were conducted in church during the adolescents’ bible study hour in Spring 2000. Each group was facilitated by a moderator, with the sessions lasting for approximately 45 minutes. The focus groups were audio taped, and the moderator took notes during the focus group sessions.

Established procedures for focus group interviews were used to ensure the validity of the study (Krueger, 1994). Literature on adolescent food choices and dietary behaviors provided the basis for the focus group questions that were carefully selected, phrased, and sequenced in advance by the researchers (see Table 1). A questioning route, with the sequence of questions in complete sentences, was developed and reviewed for content, clarity, and sequential flow of questions by an individual with experience in qualitative research. The first focus group was used to pilot test the questioning route. No changes were needed, so the responses from this focus group were included in the study results. The Institutional Review Board for the Use of Human Subjects at Georgia State University approved the study, and parental and adolescent consent were obtained prior to the beginning of each focus group.

The researchers used a transcript-based analysis (Krueger, 1994) to analyze content for the focus groups. The audio tapes from each focus group were transcribed verbatim and compared to the notes taken by the moderator during the focus group sessions. The researchers read the comments carefully, making note of key words, phrases, and quotations. They identified major ideas, attached code words to the ideas, and placed these code words in the margins throughout the transcript. Additionally, they looked for emerging themes that described the respondents’ prominent attitudes, beliefs, and feelings, prepared summary statements based on these themes, and selected quotations that provided insights into typical and common ways in which the participants responded to each question. Using this method, frequencies are used only in the broadest of terms (e.g., several, most, a few).

**RESULTS AND DISCUSSION**

Table 1 presents the major themes that emerged for each question from the focus groups, along with example responses from the adolescents. In response to the question about perceptions of healthy eating, the participants thought that eating daily from the five food groups constituted healthy eating. They also mentioned that healthy foods did not contain large amounts of fat, salt, or starches similar to meals served in fastfood restaurants.

When participants were asked if there were foods that were healthier than others, the number one response was fruits and vegetables, although the adolescents admitted to not eating fruits and vegetables on a daily basis. These findings support results obtained by Story and Resnick (1986), who reported that adolescents were well-informed about food and nutrition, but that they did not use their knowledge to actually make healthy food choices. The adolescents’ response also is similar to an analysis of fruit and vegetable intake from a nationally representative sample of children ages 2 to 18 (Krebs-Smith et al., 1996). The results indicated that 50.8% of children ate less than one serving of fruit a day, and 29.3% ate less than one serving per day of vegetables that were not fried. When asked if they consumed fruits and vegetables during lunch at school, most stated that they only entered the cafeteria to go to the snack bar. There was a general consensus of distrust of cafeteria foods among the adolescents.

Parental influence was the most frequent and first response to the question of who had the greatest influence over these adolescents’ food choices and eating habits. The second and third most common responses were peers and television. Taste also was identified during the focus groups as an important factor that influenced food choices. Additionally, the interviews indicated that female adolescents were more cognizant of peer pressure than were males, especially in reference to body image. Some females stated that if their friends said they were getting too fat, then they would decrease their food intake or starve themselves temporarily until they returned to their goal weight or size. Primary influences on these African-American adolescents’ food choices were similar to those reported by Neumark-Sztainer et al. (1999), who found adolescents’ food habits to be influenced by taste, parents, the media, and body image.

Time was identified as the number one barrier to healthy eating. More than half of the participants reported that they skipped breakfast because of lack of time. There was a general consensus that healthy eating was time consuming and inconvenient. There also was the matter of availability of healthy foods, with most respondents stating that their parents did not buy fresh fruits or healthy snacks. However, when asked if they requested healthy snacks, most of the adolescents responded in the negative. Again, these findings support those of Neumark-Sztainer et al. (1999), who reported that food availability, time, and convenience were some of the greatest influences on food choices of adolescents in their study.
### Table 1. African-American adolescents’ responses to questions regarding food choices and future health status (n=24)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Major Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>What comes to mind when you think of eating healthy?</td>
<td>1. Eating daily from the different food groups</td>
</tr>
<tr>
<td>What do you think makes a food more or less healthy?</td>
<td>2. Healthy foods have less fat, salt, or starch</td>
</tr>
<tr>
<td></td>
<td>3. Fast foods are less healthy</td>
</tr>
<tr>
<td></td>
<td>4. Fruits and vegetables are healthy foods</td>
</tr>
<tr>
<td>What or whom do you think influences your eating habits the most?</td>
<td>1. Parents</td>
</tr>
<tr>
<td></td>
<td>2. Friends</td>
</tr>
<tr>
<td></td>
<td>3. Television</td>
</tr>
<tr>
<td></td>
<td>4. Taste</td>
</tr>
<tr>
<td>What are some of the greatest problems that keep you from eating healthy?</td>
<td>1. Time constraints</td>
</tr>
<tr>
<td></td>
<td>2. Lack of convenience</td>
</tr>
<tr>
<td></td>
<td>3. Lack of availability</td>
</tr>
<tr>
<td>What would motivate you to change your eating habits?</td>
<td>1. Sickness</td>
</tr>
<tr>
<td></td>
<td>2. Nothing at this time</td>
</tr>
<tr>
<td></td>
<td>3. Availability of healthier foods</td>
</tr>
<tr>
<td></td>
<td>4. An important upcoming event</td>
</tr>
<tr>
<td>Do you think your eating habits are different from other ethnic groups?</td>
<td>1. African-Americans eat fewer vegetables than other groups</td>
</tr>
<tr>
<td>How so?</td>
<td>2. African-Americans eat less healthy than others</td>
</tr>
<tr>
<td></td>
<td>3. African-Americans cook with a lot of salt and fat</td>
</tr>
<tr>
<td></td>
<td>4. African-American foods have more flavor</td>
</tr>
<tr>
<td>What is soul food to you and do you think it can be healthy?</td>
<td>1. Soul foods include macaroni and cheese, collard greens, fried chicken, cornbread, dressing, sweet potato pie, and Koolaid</td>
</tr>
<tr>
<td></td>
<td>2. Soul foods can be healthier by using turkey instead of pork as a seasoning for vegetables</td>
</tr>
<tr>
<td></td>
<td>3. The flavor of soul food is lost if less salt and fat are used</td>
</tr>
<tr>
<td>What are your health goals 10 and 20 years from now?</td>
<td>1. To be stronger, taller and more physically fit (14 to 15-year-old normal and overweight males)</td>
</tr>
<tr>
<td>What changes do you need to make to obtain these goals?</td>
<td>2. To maintain current body weight by doing nothing (14 to 15-year-old normal weight females)</td>
</tr>
<tr>
<td></td>
<td>3. To reduce current body weight by doing nothing (14 to 15-year-old overweight females)</td>
</tr>
<tr>
<td></td>
<td>4. To maintain current level of health by changing diet and increasing level of exercise (16 to 19-year-old males and females)</td>
</tr>
<tr>
<td>How can you prevent the diseases that affect your parents and relatives, such as obesity, high blood pressure, diabetes, and some cancers, from affecting you in the future?</td>
<td>1. Confident that they will not develop diseases that affect parents or relatives (14 to 15-year-olds)</td>
</tr>
<tr>
<td></td>
<td>2. Either adopt or reject eating habits of parents based on parents’ current health status (16-19 year olds)</td>
</tr>
</tbody>
</table>

Most respondents listed their health classes at school as the number one place where they receive nutrition information, although most perceived the information as not helpful. Television also was mentioned as a source of nutrition information. Some participants reported trying to implement some of the concepts they learned in health class, but they stated that these changes did not last long. These findings suggest that helping adolescents incorporate healthy eating into their lifestyle is a major challenge. When asked what would motivate them to change their eating habits, the most
Examples of Responses

"Unhealthy foods would be fried foods or fatty foods."
"Unhealthy foods are high in starch or have too much sugar."

"How I was brought up influences my eating habits."
"My mom used to give me vegetables every day and I still eat them and fruits."
"I eat what I have a taste for."

"I skip breakfast because I don’t have time to eat in the morning."
"My parents don’t buy fresh fruits or healthy snacks."

"If I got sick and had to eat a certain way, then I would change my eating habits."
"I might change my eating habits temporarily if there was an upcoming event that I needed to lose weight for to wear a particular outfit."

"We try everything."
"Whites eat more vegetables than we do."
"We use lots of spices in our food."

"My mom uses smoked turkey instead of pork to cook vegetables."
"Healthy foods don’t taste good like soul food."

"I’d like to be stronger and taller."
"I’d like to learn how to change my diet to stay healthy."

"My mom is overweight and has high blood pressure. I’m going to stay away from red meat and try to exercise regularly."
"My mom is in excellent physical condition and I’d like to be like her."

Popular answer was if they got sick and had to eat a certain way, then they would change their eating habits. Some said nothing at this time would motivate them to change their eating habits. Adolescents in the study by Neumark-Sztainer et al. (1999) also lacked a sense of urgency about their personal health, particularly in relationship to other concerns. Some of the respondents also indicated that the availability of healthier food choices would motivate them to change their eating habits. Some of the female adolescents stated that they might consider changing their eating habits temporarily if they needed to lose weight to wear a particular outfit for an upcoming event. Again, body image influenced these adolescents’ eating behaviors, particularly for the female adolescents.

Some participants perceived that African-American soul food was less healthful than foods of other ethnic groups because of the large amounts of fat and salt used in preparing these foods. However, there was also a general consensus that African-American food was more flavorful than many other ethnic foods. The adolescents also stated that European-Americans and other ethnic groups ate more vegetables than African-Americans. Macaroni and cheese, collard greens, fried chicken, cornbread, dressing, sweet potato pie, and Koolaid were identified as soul foods. Some respondents stated that their parents prepared vegetables in a more nutritious manner by using smoked turkey for flavoring, as opposed to smoked pork often used in soul food preparation. Others felt that the flavors would be lost if they used less salt and fat. Again, taste appeared to have a major impact on these adolescents’ food preferences, and they perceived that healthy foods (those low in fat and salt) did not taste good.

Participants were asked about their health goals 10 and 20 years into the future and what changes they would need to make to obtain those goals. To some extent, responses to this question varied by age, gender, and body weight. Overall, 14- to 15-year-old students with normal weight reported their goal was to remain at the same physical size and/or fitness level, and those who were overweight desired to lose weight, but thought they could do so by continuing their current dietary behaviors. Female adolescents of normal weight, ages 14 to 15, felt they would maintain their current body weight if they did nothing, and the overweight females in this age group also felt they would have a reduction in weight if they did nothing. Both normal weight and overweight 14- to 15-year-old males desired to be stronger, taller, and more physically fit in the future, but thought they could achieve these goals by continuing their current health behaviors.

These responses were similar to those of adolescents studied by Trad (1993), who found that decisionmaking competence was a function of age and those between the ages of 12 to 15 had difficulty predicting their future health because of the need for sophisticated thought processes. Both males and females in the 16- to 19-year-old age group identified their health goal as remaining at their current level of health. In contrast to the younger adolescents, the older students knew they would need to make changes in their diet and increase their level of exercise to achieve their goals, but they had difficulty articulating the steps necessary to reach their desired healthy lifestyle.

When asked how they could prevent such diseases as high blood pressure, diabetes, obesity, and cancer, which affected their parents and relatives, adolescents ages 14 to 15 were confident they would not develop those diseases. This result is similar to that of Neumark-Sztainer et al. (1999), who found that healthy eating was a low priority among adolescents in their study, and that they thought they were too young to worry about health. Unlike their younger counterparts, adolescents ages 16 to 19, who thought they would either adopt or reject the eating habits of their parents based on their parents’ current health status. This finding supports the importance of waiting until the high school years to emphasize the association between nutrition and health that tends to be too abstract for younger audiences (Lytle & Achterberg, 1995).

CONCLUSIONS AND APPLICATIONS

A model used to develop interventions to improve the dietary behaviors of adolescents must consider factors that influence their food choices, as well as challenges adolescents face in consuming a healthy diet. Findings from this study suggest that influences on African-American adolescents’ food choices are similar to those of other adolescents, and include parental influence, time constraints, taste, body image, food availability, peers, and television. These adolescents seemed to be aware of...
what constituted a healthy diet, yet they had difficulty putting this knowledge into practice.

Findings from this study support the use of the Social Cognitive Theory in the development of nutrition interventions to meet the needs of adolescents. Social Cognitive Theory recognizes the importance of socioenvironmental factors (parental influence, peers, food availability), personal factors (taste, body image), and behavioral factors (meal patterns, culture, lifestyles), and the interplay among them (Bandura, 1986; Glanz, Lewis, & Rimer, 1997). This study also suggests that a nutrition intervention for the younger adolescents would not be effective if it stressed future health outcomes. An appropriate intervention for the 14- and 15-year-old adolescents would need to focus on such short-term benefits of healthy eating as appearance, sports, success, and school performance.

In using a social learning model, emphasis should be placed on the following: (1) health issues of interest to these adolescents, such as body image and appearance; (2) environmental changes, such as offering fresh, attractive, and flavorful fruits and vegetables in the cafeteria and preparing and serving them in a variety of appealing ways; (3) skill-building activities that address problem areas, such as preparing a fast, nutritious breakfast in less than three minutes in the morning; and (4) linkages with parents, schools, and those involved in policy-making to address barriers to healthy eating, such as working with parents to increase the availability of healthy foods in the home.

Results of this study also have important implications for school nutrition professionals. Additional promotion of the school nutrition programs with this target group is needed, since many of these adolescents reported they did not participate in the school breakfast or lunch programs. A breakfast program where foods are served in the classroom during homeroom might appeal to these adolescents and help them overcome some of the barriers that prevent them from eating breakfast. The cafeteria also could feature a variety of ethnic and cultural foods each week, including soul foods, with an emphasis on healthy and flavorful ethnic foods. School nutrition professionals also could collaborate with school officials and local vendors to feature healthy items, including fresh fruits, fruit juices, water, and milk, in school vending machines to increase the availability of healthy foods in the school environment.

Using focus groups is an appropriate forum for determining the nutrition needs and interests of a specific target population, such as African-American adolescents. However, focus group findings do not necessarily represent the opinions of the general population and cannot be extrapolated to the larger group. Results of this study could be used as a basis for developing a larger scale investigation of nutrition and health-related views of African-American adolescents. In addition, results could be used to design a developmentally appropriate and culturally relevant nutrition intervention for the group of African-American adolescents in this study (Centers for Disease Control and Prevention, 1996). Some suggestions for such interventions include:

- Assessing the needs of the African-American community and involving the community (including parents, teachers, school nutrition personnel, and school administrators) in the planning and implementation of the intervention.
- Developing parent and adolescent cooking classes that teach healthy preparation of soul foods without sacrificing taste.
- Establishing a peer-generated social group in a community setting that encourages healthy eating outside the home and includes physical activity as a component of each group meeting.
- Partnering with the media to promote healthy eating in culturally appropriate vernacular of the targeted audience.

ACKNOWLEDGEMENTS
The authors would like to express appreciation to the adolescents who volunteered to participate in the focus groups and to their parents who allowed them to do so.

REFERENCES


Costs and Nutritional Contributions of Entrees in School Lunch Menus

Lora E. Gilbert, MS, RD, LD; and Carol W. Shankin, PhD, RD

The purpose of this study was to explore differences in the cost and nutrient content of entrees served in two Midwest school districts, District A and B, which had enrollments of 516 students and 1,230 students, respectively. This study evaluated the nutrient content of the meal, nutrient contribution of the entree component, and cost of the entrees for planned and served menus during two time periods, Periods 1 and 2. Entrees were categorized as fish, pizza, sandwich, poultry, Tex-Mex, and traditional.

NutriKids™ databases were established for the two districts for both planned and served menus, and were used to analyze the nutrient content and costs of the meals. Descriptive statistics were used to determine the percentage of daily contributions for each of the nutrients and weekly averages for the different menu components. T-tests were used to determine significant differences between time periods and districts. Analysis of variance was used to determine significant differences in the nutritional content of the menus based on entree type.

No significant differences were found in nutrient content of the planned and served menus between Periods 1 and 2. Total costs per meal were not significantly different. Entree costs ranged from $0.21/serving to $0.36/serving and contributed between 25% and 50% of the total cost of the meal as served. The nutrient contributions of entree categories varied based on entree served. Results illustrate the value of considering the number of calories and other nutrients provided by the entree in comparison to entree cost per serving and the percentage food cost for the entree component. Data support the importance of purchasing decisions related to the market form of food, brands, and quality in relation to cost and nutrient content of products. Knowledge of nutrients/penny for products and menu combinations should assist menu planners in achieving nutritional goals of the National School Lunch Program within the district's budgetary constraints.

M eals served in the National School Lunch Program (NSLP) currently are being evaluated to determine their compliance with the U.S. Department of Agriculture’s (USDA) School Meal Initiative (SMI) requirements (School Meal Initiative, 1995). The weekly average nutrient content of menus planned for schools participating in the NSLP are required to comply with the Dietary Guidelines for Americans (USDA, 1995). Of particular concern to school foodservice directors is achieving the goal of ≤30% of calories from fat and <10% of total calories from saturated fat. The SMI also requires school lunches to provide at least one-third of the Recommended Dietary Allowances (RDA) for protein, calcium, iron, and vitamins A and C. The challenge for menu planners is to meet these nutritional requirements and goals within budgetary constraints of the district.

Menu planners began emphasizing the fat content of the menus after the School Nutrition Dietary Assessment Study (Gordon, Devaney, & Burghardt, 1995) reported that school lunches contained a higher percentage of fat than the mandated ≤30% of calories from total fat. Some directors focused their attention on serving lowfat menu items rather than nutrient-dense products (Hoover et al., 1998). One strategy used to lower fat content included the classification of foods as “high” and “low” fat. High-fat items were either eliminated or served less often. Schools that used this strategy experienced decreased participation rates (Burghardt, Devaney & Gordon, 1995). When foods were eliminated to meet the fat requirements, additional items had to be served to meet nutrient minimums. Yakawich (1997) reported that meeting the caloric requirements was particularly challenging.

Regardless of which strategies are used to decrease the fat content, knowledge of the nutrient density relative to cost is essential for effective menu planning. Georgiou, Long, and Lloyd (2000) recommended evaluating nutrient density for all components because students may not have time to eat all the items served. Menu planners also must consider the overall contribution of menu components to meeting the nutrient requirements relative to their cost. In addition to meeting USDA regulations, school foodservice
directors identified food costs, participation, taste, and the nutrient content of the meal as other important factors to consider when planning meals (Hewes et al., 1996).

Several recent studies have evaluated the effect of implementing the dietary guidelines and the SMI (Burghart et al., 1995; Nicklas, 1995; Williams, Greig, Caner, & Shanklin, 1997; Yakovich, 1997; Friedman & Hurd-Crixell, 1999; Georgiou et al., 2000). No research studies were found that compared the quality of a specific nutrient, such as calcium, and the cost of providing this nutrient on the menu. The purpose of this study was to explore differences in the cost and nutrient content of entrees in menus planned and served in two school districts in the Midwest for two time periods (Period 1 and Period 2). The menu planning strategy used was to balance menus that contained items both high and low in fat, and to focus on the entree because this component contributes more than 50% of the total and saturated fat in the menu. When averaged over a week, the menus were planned to provide ≤30% calories from fat.

METHODOLOGY
Nutrient Analysis of Menus. This research was designed to evaluate the costs and nutrient content of meal components served in the school lunch program in two elementary schools in two Midwest school districts (District A and District B). Descriptions of these districts are presented in this study, which explored the differences in the costs and nutrient contents of the menus for different entree types. Entrees were categorized as fish, pizza, sandwich, poultry, Tex-Mex, and traditional. Traditional entrees included items made from basic ingredients, including such foods as chili, chicken and noodles, macaroni and cheese, and spaghetti with meat sauce. Tex-Mex entrees included burritos, tacos, and nachos.

The four-week cycle menu was planned for two time periods, Period 1 and Period 2, and followed guidelines for nutrient standard menu planning, also referred to as Nutrigen and general menu planning (School Meal Initiatives, 1995). The foodservice directors and their staff reviewed the menus prior to Period 1, and necessary modifications were made to the menus and recipes. The planned menus and supporting documents, which included standardized recipes, were provided for the two directors one month prior to the date that they were served, so that they could use them to order food and supplies.

The planned menus were then implemented in Period 1. Served menus were defined as actual menu items served, and were based on data collected on the exact quantity of ingredients used in the recipes, the actual portion size served, the condiments provided, and other data that helped document exactly which menu items were served. These data were entered into a separate NutriKids™ file to create a database on the served menus. Menus were then revised based on changes that the foodservice directors felt were essential to accommodate student preferences prior to serving the menus in Period 2. The approved planned menus for both periods met the SMI guidelines based on the original forecasts provided by the two directors.

The specific brands of convenience items and standardized recipes that each district served were included in the nutrient database. NutriKids software was used to analyze the nutritional content of the four-week cycle menu as planned and served for Periods 1 and 2 (Yakovich, 1997). Specific nutrients analyzed included calories, protein, total fat, saturated fat, calcium, vitamin A, vitamin C, and iron. Percentage of calories from fat for each meal component was determined. Daily and weekly averages of the nutrient content of the menus for the different types of entrees were analyzed for the planned and served menus for the two school districts for Period 1 and 2.

Description of Districts. A total of 516 students were enrolled in District A when the initial study was conducted in the 1996-97 school year. Students in grades 1 and 2, 3 and 4, and 5 and 6 attended three separate elementary schools with enrollments of 99, 194, and 223, respectively. Average lunch participation was 91% during the study.

Each school prepared its meals, except bakery items, in an onsite kitchen. Bakery items were produced in the middle school kitchen and delivered to the elementary schools. Data were collected from all three schools; however, nutritional analysis of planned and served menus was completed for the elementary school attended by the 2nd- and 3rd-graders. This school was selected based on the foodservice director's recommendation. The student population reflected the district's average participation in free and reduced meals, as well as the foodservice staff's willingness to document the data needed for actual ingredients used in the recipes and the actual portion sizes and condiments served.

District B had an enrollment of 1,330 students during the study period. Elementary students attended four different schools with enrollments ranging from 252 to 332 students. All menu items were produced in a central kitchen and delivered to each school. Nutritional analysis was based on production records obtained from the central kitchen records of participation and item use from the elementary schools.

Data Analysis. Descriptive statistics were used to determine the percentage of daily contribution for each of the nutrients and weekly average for the different menu components. T-tests were used to determine significant differences in the nutritional content between Periods 1 and 2 and Districts A and B. Analysis of variance was used to determine significant differences in the nutritional contents of the menus based on entree types. Districts A and B were compared to determine if size and market form of food purchased affected the nutrient quality of the meals served and the costs of the different meal components.

RESULTS AND DISCUSSION
Costs Per Entree and Per Meal. Table 1 illustrates the average costs per meal and average costs per entree for planned and served menus in both districts. The average costs per meal and per entree were $0.75 and $0.20 for District A and $0.80 and $0.37 for District B, respectively.

District A. The average food cost per meal was similar for all entrees, except traditional, which had the lowest cost per meal ($0.65 planned and $0.63 served) (Table 1). When fish was served as the entree, the cost per meal was the highest at $0.81. The average food cost per meal when pizza was the entree was $0.77, but the total cost per meal was not significantly higher than when other entrees were served. Entree costs ranged from $0.23 to $0.36 and $0.21 to $0.36 per serving for planned and served meals, respectively. The entree costs of served menus ranged from 25% to 40% of the total food costs. Food cost per serving of pizza was significantly higher than that of the other entrees. The average cost for pizza was 47% of the total meal costs. However, pizza provided
Table 1. Total meal cost, cost per entree, total kilocalories, percentage of kilocalories from entree, and percentage cost of entree for planned and served menus in Districts A and B

<table>
<thead>
<tr>
<th>Entree Type</th>
<th>District</th>
<th>Meal ($)</th>
<th>Entree Cost ($)</th>
<th>Calories (Meal)</th>
<th>% Calories (Entree)</th>
<th>% Cost (Entree$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Planned</td>
<td>Served</td>
<td>Planned</td>
<td>Served</td>
<td>Planned</td>
</tr>
<tr>
<td>Fish</td>
<td>A</td>
<td>0.81</td>
<td>1.03</td>
<td>0.26</td>
<td>0.26</td>
<td>815</td>
</tr>
<tr>
<td></td>
<td>B²</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Pizza</td>
<td>A</td>
<td>0.77</td>
<td>0.76</td>
<td>0.36</td>
<td>0.36</td>
<td>727</td>
</tr>
<tr>
<td></td>
<td>B</td>
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<td>0.85</td>
<td>0.40</td>
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<td>0.83</td>
<td>0.80</td>
<td>0.37</td>
<td>0.37</td>
<td>868</td>
</tr>
<tr>
<td>Poultry</td>
<td>A</td>
<td>0.76</td>
<td>0.77</td>
<td>0.26</td>
<td>0.24</td>
<td>961</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>0.81</td>
<td>0.82</td>
<td>0.37</td>
<td>0.37</td>
<td>779</td>
</tr>
<tr>
<td>Tex-Mex</td>
<td>A</td>
<td>0.72</td>
<td>0.75</td>
<td>0.24</td>
<td>0.23</td>
<td>777</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>0.79</td>
<td>0.82</td>
<td>0.39</td>
<td>0.41</td>
<td>763</td>
</tr>
<tr>
<td>Traditional</td>
<td>A</td>
<td>0.65</td>
<td>0.63</td>
<td>0.24</td>
<td>0.21</td>
<td>857</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>0.63</td>
<td>0.83</td>
<td>0.39</td>
<td>0.39</td>
<td>760</td>
</tr>
</tbody>
</table>

$\text{Percentage cost of entree based on total meal cost}$

$\text{Fish was not served as an entree in District B}$

49% of the total calories in the meal. Sandwich entrees provided between 43% and 44% of the calories; entree costs for these items ranged from 26% to 32% of the total food costs. In contrast, poultry, traditional, and Tex-Mex entrees provided averages of 20%, 34%, and 35% of the total calories, respectively, in the menus as served. These data illustrate the value of considering the number of calories and other nutrients provided by the entree in comparison to entree cost per serving and the percentage food cost for the entree component.

District B. The average food costs in the planned menus ranged from $0.78 to $0.83 per meal in District B (Table 1). The average cost of the entrees was $0.37 or approximately 11 cents more than that in District A. Entree costs for the planned and served menus ranged from 41% to 49% and 38% to 50%, respectively. No significant differences were found in costs and the entree category.

Average food cost of pizza was $0.38 or 40% of total food cost. The cost of the Tex-Mex entree category also was higher than in District A, partly because a convenience branded burrito was served once during the study. The differences illustrate the importance of purchasing decisions as to market form of food, brands, and quality selected.

Nutrient Content of Meal and Entree Contribution.

District A. The caloric requirement at lunch for elementary school students is a minimum of 664 calories, averaged over a week (School Meal Initiative, 1995). All planned and served menus exceeded this minimum requirement; an average of 829 calories was available. Table 2 illustrates the nutrient content of the planned menus for both districts and the nutrient contributions of the entree to the total meal. Although poultry entrees provided significantly fewer calories than the other entree categories, the meals with poultry had the highest number of calories (926).

The differences can be attributed to the other menu items served that often included some type of frozen potato product or mashed potato with gravy, salad with Ranch dressing or canned/frozen vegetable, canned fruit, homemade roll, and margarine. The caloric content of meals with pizza and Tex-Mex had similar caloric contents (731 and 758, respectively) and contained more fat than the other entree categories. Meals with pizza as an entree provided significantly more calcium and iron than other entree categories. The sodium content ranged from 1,296 to 2,085 mg per meal and averaged 1,548 mg served. All meals exceeded the Dietary Guidelines' (1995) recommendation of 1,900 or less mg per lunch averaged over a week. Entrees contributed between 26% and 68%
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<table>
<thead>
<tr>
<th>Entree District Type</th>
<th>Calories</th>
<th>Iron</th>
<th>Calcium</th>
<th>Vitamin A</th>
<th>Vitamin C</th>
<th>Protein</th>
<th>CHO</th>
<th>Total Fat</th>
<th>Sat. Fat</th>
<th>Sodium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish A</td>
<td>199 Cal</td>
<td>24</td>
<td>2.2</td>
<td>52</td>
<td>32.0</td>
<td>8.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>12.0</td>
</tr>
<tr>
<td>Fish B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pizza A</td>
<td>361 Cal</td>
<td>50</td>
<td>1.8</td>
<td>13</td>
<td>368.5</td>
<td>53</td>
<td>145.0</td>
<td>35</td>
<td>3.9</td>
<td>11</td>
</tr>
<tr>
<td>Pizza B</td>
<td>414 Cal</td>
<td>51</td>
<td>3.5</td>
<td>70</td>
<td>277.1</td>
<td>47</td>
<td>117.3</td>
<td>31</td>
<td>2.7</td>
<td>8</td>
</tr>
<tr>
<td>Sandwich A</td>
<td>340 Cal</td>
<td>43</td>
<td>1.9</td>
<td>52</td>
<td>82.4</td>
<td>20</td>
<td>8.9</td>
<td>4</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Sandwich B</td>
<td>357 Cal</td>
<td>42</td>
<td>2.1</td>
<td>51</td>
<td>72.8</td>
<td>17</td>
<td>20.5</td>
<td>6</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Poultry A</td>
<td>243 Cal</td>
<td>23</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Poultry B</td>
<td>292 Cal</td>
<td>38</td>
<td>1.9</td>
<td>46</td>
<td>26.1</td>
<td>8</td>
<td>14.0</td>
<td>4</td>
<td>0.0</td>
<td>0</td>
</tr>
<tr>
<td>Tex-Mex A</td>
<td>295 Cal</td>
<td>37</td>
<td>1.0</td>
<td>11</td>
<td>166.2</td>
<td>38</td>
<td>99.0</td>
<td>37</td>
<td>0.5</td>
<td>3</td>
</tr>
<tr>
<td>Tex-Mex B</td>
<td>256 Cal</td>
<td>33</td>
<td>2.9</td>
<td>53</td>
<td>122.0</td>
<td>29</td>
<td>57.3</td>
<td>22</td>
<td>9.3</td>
<td>52</td>
</tr>
<tr>
<td>Traditional A</td>
<td>326 Cal</td>
<td>35</td>
<td>3.5</td>
<td>49</td>
<td>49.5</td>
<td>13</td>
<td>85.0</td>
<td>16</td>
<td>13.6</td>
<td>31</td>
</tr>
<tr>
<td>Traditional B</td>
<td>208 Cal</td>
<td>28</td>
<td>2.5</td>
<td>47</td>
<td>27.9</td>
<td>8</td>
<td>78.3</td>
<td>11</td>
<td>6.2</td>
<td>18</td>
</tr>
</tbody>
</table>

*Menus planned using NutriMenu Guidelines. Nutrient content is the average for Periods 1 and 2, since no significant differences were found between two periods.

**Note:** Percentage contribution of the entree to nutrient content of the meal.

---

of the sodium in the meals. Preprocessed entrees contributed to higher percentages of a meal's total sodium than did scratch entrees or entrees that did not contain additional breading or cheese. However, meals with traditional entrees contained 1,837 mg of sodium per meal. This illustrates that the amount of fat in the entree should not be the only factor considered in menu planning. When planning menus, all key nutrients contributed by each menu component should be evaluated.

**District B.** When the food costs and nutrient contributions of all components of planned and served menus were compared in District B, few significant differences were observed. Significant differences were found in the sodium, calcium, and total fat contents of the entree categories for the planned menus. The Tex-Mex category had significantly less sodium than pizza, traditional, sandwich, and poultry entrees. However, all entree categories were high in sodium.

When pizza was served as the entree, the meals contained significantly more calcium. Pizza provided an average of 61% total calories, 47% calcium, and approximately 31% vitamin A in the meal. Pizza meals also provided significantly more iron than meals with poultry and sandwich entrees. Additionally, meals with traditional entrees were significantly lower in fat. No significant differences were found in the total fat contents of meals when Tex-Mex, pizza, or sandwiches were served.

The differences in the nutrient contents of the entrees and meals between the two districts (Table 2) support the importance of the menu planner being knowledgeable about the nutrient contents of all components of the meal, especially the entree component, because of the percentage of the total cost of the meal derived from this menu item.

**Nutrient Content Per Penny.** The demand for specific nutrients and low-cost products presents an interesting challenge for the menu planner who is choosing menu items. Tools to analyze the nutrient contribution in respect to the cost of the item are needed to fully understand the choices that are available. The nutrients that are provided per penny (Table 3) facilitate comparison between the entree and the complete meal. This information enables the menu planner to look beyond the total cost of the entree and nutrition label to the more important issue of the economics of offering an entree and the total nutrient value provided.

Table 3 shows that calories provided per penny ranged from 6 to 14 for the six entree

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## Table 3. Average nutrient contribution per penny of all components and per entree for planned menus* in Districts A and B

<table>
<thead>
<tr>
<th>Entree Type</th>
<th>District</th>
<th>Calories M</th>
<th>Sodium M</th>
<th>Iron M</th>
<th>Calcium M</th>
<th>Vitamin A M</th>
<th>Vitamin C M</th>
<th>Protein M</th>
<th>CHO M</th>
<th>Fat M</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Kcal E</td>
<td>mg</td>
<td>mg</td>
<td>mg</td>
<td>RE</td>
<td>mg</td>
<td>g</td>
<td>g</td>
<td>g</td>
</tr>
<tr>
<td>Fish</td>
<td>A</td>
<td>9 7</td>
<td>15 17</td>
<td>0.1 0.1</td>
<td>4.6 1.2</td>
<td>3.4 0.0</td>
<td>0.7 0.1</td>
<td>0.3 0.5</td>
<td>1.2 0.6</td>
<td>0.4 0.4</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pizza</td>
<td>A</td>
<td>10 10</td>
<td>17 23</td>
<td>0.2 0.1</td>
<td>9.0 10.3</td>
<td>5.5 3.8</td>
<td>0.5 0.1</td>
<td>0.4 0.5</td>
<td>1.2 1.0</td>
<td>0.4 0.5</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>10 10</td>
<td>20 28</td>
<td>0.1 0.1</td>
<td>7.3 7.0</td>
<td>4.6 3.0</td>
<td>0.5 0.1</td>
<td>0.4 0.5</td>
<td>1.3 1.1</td>
<td>0.3 0.5</td>
</tr>
<tr>
<td>Sandwich</td>
<td>A</td>
<td>10 13</td>
<td>21 28</td>
<td>0.1 0.1</td>
<td>5.4 3.9</td>
<td>2.8 1.0</td>
<td>0.2 0.0</td>
<td>0.4 0.6</td>
<td>1.5 1.6</td>
<td>0.4 0.6</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>11 12</td>
<td>21 31</td>
<td>0.1 0.1</td>
<td>5.6 3.1</td>
<td>4.3 1.0</td>
<td>0.2 0.0</td>
<td>0.4 0.5</td>
<td>1.5 1.2</td>
<td>0.3 0.5</td>
</tr>
<tr>
<td>Poultry</td>
<td>A</td>
<td>13 12</td>
<td>20 17</td>
<td>0 0</td>
<td>4.3 0.1</td>
<td>3.6 0.0</td>
<td>0.5 0.0</td>
<td>0.4 0.5</td>
<td>1.6 0.5</td>
<td>0.5 1.2</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>10 8</td>
<td>16 16</td>
<td>0.1 0.1</td>
<td>4.2 0.7</td>
<td>4.5 0.4</td>
<td>0.2 0.0</td>
<td>0.4 0.5</td>
<td>1.3 0.7</td>
<td>0.3 0.4</td>
</tr>
<tr>
<td>Tex-Mex</td>
<td>A</td>
<td>11 12</td>
<td>20 26</td>
<td>0.1 0.5</td>
<td>6.9 6.6</td>
<td>4.0 3.7</td>
<td>0.3 0</td>
<td>0.4 0.5</td>
<td>1.4 0.8</td>
<td>0.4 0.8</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>10 7</td>
<td>15 13</td>
<td>0.1 0.1</td>
<td>3.4 3.8</td>
<td>3.3 2.1</td>
<td>0.2 0.4</td>
<td>0.4 0.4</td>
<td>1.5 0.6</td>
<td>0.3 0.4</td>
</tr>
<tr>
<td>Traditional</td>
<td>A</td>
<td>13 14</td>
<td>25 30</td>
<td>0.2 0.1</td>
<td>6.5 3.1</td>
<td>8.5 4.2</td>
<td>0.5 0.5</td>
<td>0.5 0.7</td>
<td>1.6 1.4</td>
<td>0.4 0.6</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>9 6</td>
<td>19 18</td>
<td>0.1 0.1</td>
<td>4.4 0.9</td>
<td>6.6 2.5</td>
<td>0.4 0.2</td>
<td>0.4 0.5</td>
<td>1.3 0.4</td>
<td>0.2 0.2</td>
</tr>
</tbody>
</table>

*Nutrient for planned menus are the average of Periods 1 and 2, because no significant differences occurred between the two periods.

*Nutrient data provided for total meal (M) and for each entree category (E)

*Fish not included.

Types and averaged 10 calories per penny. More calories per penny would be advantageous because school foodservice programs are required to provide a minimum of 664 calories for students in grades K to 6. Entrees that provide fewer calories per penny might be paired with items that provided more calories, such as dessert. Looking at the nutrients per penny provides a clearer picture of the nutritional value of the item in the meal.

The goal for maximum sodium content in school lunch is 1,000 mg or less per lunch averaged over the week (Stuhldreher, Jordon, & Head, 2000). Shanklin (1999) reported that milk accounted for about 15% of the meal's total sodium. Although the entree accounted for the majority of the meal's sodium (40% to 50%), all other menu items also contributed to sodium levels. For example, fruits and vegetables contributed 10% to 13%; grains and breads 10% to 17%; and miscellaneous (e.g. catsup, salsa, salad dressings) contributed 14% to 23%. Thus, the sodium level in all items needs to be addressed, not just in the entrees.

Looking at only the sodium content of the menu item could result in the loss of other valuable nutrients. When the cost per penny (Table 3) of sodium is compared, the mg of sodium per penny in the entree is not that much higher than the mg per penny of the total meal. Menu planners can use data in Table 2 to compare the total contribution to the meal. Table 3 further helps the menu planner evaluate the total nutrient benefits provided in the entree relative to its sodium content.

Although vegetables are major sources of vitamin A, Shanklin (1999) reported that milk also is an important source. However, because milk consumption decreases in the upper grades, items with a high contribution of vitamin A would be of value in the menu. Tex-Mex, traditional, and pizza menu items supplied about 30% of the vitamin A for the meals because of cheese and tomato products in these items. To balance menus, all sources of nutrients should be considered.

**Conclusions and Application**

The costs of six categories of entrees—traditional, Tex-Mex, poultry, fish, sandwiches, and pizza—were compared to the total costs of the meal. The average food costs...
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per meal were $0.75 in District A and $0.80 for District B. The average entree costs for Districts A and B were $0.26 and $0.37, respectively. The entree’s total meal costs ranged from 25% for fish to 50% for Tex-Mex. The percent calories for the total meal from the entree ranged from 22% for fish to 51% for pizza. It was interesting to note that more expensive items did not always provide the majority of the calories in the meal. These results illustrate the importance of comparing costs and nutrient contributions of all components of the meal and not focusing just on the entree. Although cost and nutrient contributions are important, student preferences cannot be overlooked during menu planning because student acceptability affects the actual nutrients consumed.

Analysis of the nutrient contribution per penny allows the menu planner to view the value of the entree both economically and nutritionally. Although most entrees are expected to be main sources of calories, our study found a wide range in the number of calories provided by the entree component. The most calories provided per penny from Districts A and B were 14 and 12, respectively. Although the number of calories did not vary greatly, District B had more entrees that provided less than 10 calories per penny.

In trying to meet the caloric requirements, the importance of the nutrient density for other such nutrients as iron, calcium, vitamins A and C, protein, and carbohydrates should not be ignored. All entrees provided about 0.1 mg of iron, except one Tex-Mex entree that provided only 0.5 mg. The only entrees that contributed to the calcium content of the meal were those that contained cheese. Entrees containing tomatoes, cheese, or both provided more vitamin A than those without these ingredients.

The menu is an essential planning document in foodservice operations. Planning a foodservice business begins with the menu and the selling price of menu choices (Spears, 2000). The NSLP is no exception. This program has been working to meet the Dietary Guidelines for Healthy Americans (1995) and the SMI regulations (1995), while simultaneously staying within the budget.

The demand for specific nutrients and low-cost products presents a challenge for menu planners. Tools to enable the menu planner to look beyond the total cost of an item and one nutrient (most often, fat) are needed to evaluate products and their value. Table 1 shows that planned meals and what actually is served often are different. Menu planners must keep in mind that changes often are made in planned menus and that they affect the cost and nutrient values.

Further, understanding the nutrient contribution of the entree (Table 2) and its impact on the entire meal also is important. Therefore, the economic value is not just the cost of the entree, but also the cost of putting this entree on the menu. The planner then can decide how many other items must be added to meet requirements for calories, vitamins, and minerals. This also shifts the menu planner from thinking only of fat to considering the nutrient density of the entree. Although some entrees are considered to be too high in fat, contributing more than 30% of the calories, they also may contribute minerals or vitamins at a greater than 30% value. This type of spreadsheet could even be shown by the product manufacturers to illustrate the nutrient value of their products. Showing the menus and their nutrient contributions within a meal would be a valuable tool for menu planners.

Still, another tool for menu planners to evaluate entrees, independent of a menu, would be a table showing the amount of nutrients compared to the cost. The example presented in Table 3 provides the menu planner with data needed to compare different entrees. When nutrients are represented in the values per penny of the entree cost, the density of nutrients can be compared with the cost of the item. Now, a “high cost” and “low cost” entree can be considered by what it contributes to the menu, so identifying an item that is not cost effective becomes easier. Of course, even some items not contributing nutrients still may be included on the menu, if they are favorites of participants. This would help the menu planner decide what to include on the menu with that item and the frequency of offering different items.

The comparison of the two districts in this study showed that one had more economic entrees. This may be because of the size and ability to order higher volumes, distance to delivery, or other variables affecting unit costs. Knowledge of all costs is needed to compare meal costs. Networking to share cost and nutrient data could be used to seek lower costs and higher nutrient density in entrees chosen.

The challenge for menu planners is to find or develop tools that will assist them in evaluating guidelines and budgetary constraints at the same time. This study identified various tools that could assist the menu planner in meeting the nutritional goals of the National School Lunch Program and financial constraints of the school district.

ACKNOWLEDGEMENTS

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School meals initiative for healthy children; Final regulation (7 CFR 210,220). (June 13, 1995).
Federal Register, 60, 31187-31222.
The purpose of this study was to examine the needs for professional development of school foodservice directors nationwide. A survey instrument was developed to elicit information regarding the professional development topics they considered most important and the delivery formats and modes they preferred. The instrument was mailed to a sample of 1,083 participants drawn at random from a national database of school foodservice directors. A total of 328 (30%) of the 1,083 directors in the sample completed and returned the surveys. Almost half of the respondents worked in districts with fewer than 1,000 students. Further, 47% of the respondents had 11 or more years of experience as school foodservice directors. In addition, 49% reported student participation rates of more than 71% in their school foodservice program, with 52% of the respondents expecting no change in their rate of participation and 40% expecting an increase.

Results indicated that specific computer skills training, nutrition awareness, and marketing of the school foodservice program ranked highest among the professional development topics needed by directors responding to the survey. Other high-priority topics included keeping up-to-date with government regulations and managing budget issues. The professional development formats most preferred were hands-on workshops and use of demonstrations.

The most preferred delivery modes were state agency-sponsored conferences/workshops and theme-based seminars allowing for discussions with other directors. Based on the results of this survey, it appears that relevant, theme-based seminars have high potential for meeting many of the professional development needs of school foodservice directors. Specifically, these seminars should focus on such issues as: using the computer as a management, training, and promotional tool; understanding new government regulations; increasing nutrition awareness among students and teachers; managing the financial aspects of the foodservice program; using effective marketing strategies for the foodservice program; increasing efficiency and appropriate use of equipment; and providing effective staff training.

The professional development needs of school foodservice directors continue to change due to the dynamic environment in which they operate (Sneed & White, 1989). Examples of these changes include improving technology; changing worker demographics; changing governmental requirements; increasing knowledge about nutrition, the growing need for marketing, and increasing competition. These changes necessitate an ongoing assessment of the knowledge and skills that directors and their staff need in order to continue performing their work effectively over the next few years. To be optimally useful, such an assessment should address the priority of each of the identified professional development needs, as well as the design and delivery methods that are most desirable for addressing these concerns.

This study builds on earlier research examining directors' and managers' training needs. Sneed (1992) conducted a study of the continuing education needs of school foodservice supervisors. Using research literature, Sneed developed a list of 55 "job-related areas important for the effective performance of an individual who manages a foodservice operation," and then sampled supervisors and managers employed in schools, restaurants, and healthcare operations in Tennessee. Sneed found that the foremost continuing education needs of this group included financial management issues, concern about state and federal regulations, personnel management, and menu planning.

Gregoire and Sneed (1994) extended this research by focusing on the necessary competencies identified for district school nutrition directors and supervisors as part of a study for the National Food Service Management Institute (NFSMI). The purpose of this national study was the development and validation of a list of 192 competency statements, divided into 16 functional areas for district school nutrition directors and supervisors. Some of the areas covered included nutrition and menu planning, nutrition education, personnel management, and
professional development. Gregoire and Sneed asked respondents to evaluate both the importance and frequency of these competency statements, and found that 159 of the 192 (83%) competency statements appeared to be either important or very important to director/supervisors. The competency areas that received the highest overall importance ratings included service, sanitation and safety, financial management, and record keeping. The competency statements that received lower importance ratings were in the areas of nutrition education and professional development (Gregoire & Sneed, 1994).

From 1995 through 1997, the National Food Service Management Institute (NFSMI) developed a series of training needs assessments for a consortium of state Nutrition Education and Training Programs. These studies, which assessed statewide training needs of directors and managers, were conducted by 12 states using survey instruments developed by NFSMI and modified by state offices. These studies were intended to assess training needs within individual states and were conducted according to the state-determined design.

In summarizing results of the 11 state-level studies for which comparable data were available, Sullivan (1998) found that directors reported high levels of interest in developing and implementing standards for program quality and employee performance, as well as in acquiring general leadership skills and specific personnel management skills. School foodservice managers' perceived training needs also included leadership skills as motivating employees to provide better customer service, managing to ensure timeliness, and team building with school foodservice employees.

The current study updates and extends this earlier research on foodservice directors' professional development needs. To accomplish this, the study answers the following research questions:

- What knowledge and skills do school foodservice directors need to perform their work more effectively over the next several years?
- What is the relative priority of each of these professional development needs?
- What are the preferred formats for meeting directors' professional development needs over the next several years?

**METHODOLOGY**

**Research Questionnaire.** The researchers used qualitative and quantitative methods to assess school foodservice directors' professional development needs. In the initial stages, the researchers developed a preliminary survey instrument based on telephone interviews conducted with 10 school foodservice directors selected at random from lists of directors. Although each of these directors worked in different states (e.g., Florida, Arizona, Iowa, and Virginia), no attempt was made to ensure that all regions—as defined by the U.S. Department of Agriculture (USDA)—were represented. In these interviews, directors were asked to comment on the knowledge and skills in which they were most interested, as well as the delivery formats and modes they preferred. In addition, the researchers reviewed the relevant research literature related to the responsibilities of school foodservice directors. A number of items suggested by this literature was included in the pilot test version of the survey form.

To assess the content validity of this preliminary instrument, the researchers conducted a focus group interview with a group of school foodservice directors during the American School Food Service Association's Annual National Conference in July 1999. The directors provided a broad range of suggestions, resulting in a major revision of the instrument. The researchers conducted a pilot test of the revised draft instrument using a random sample of 100 foodservice directors. An accompanying cover letter asked directors to complete the survey and to comment on the form as a whole and on individual items. Based on feedback received from these directors, minor revisions to the content and format of the instrument were made.

As a final step in ensuring content validity, the instrument was presented for review by the Food and Nutrition Subcommittee of the Education Information Advisory Committee (EIAC), Council of Chief State School Officers. In response to the suggestions made by EIAC's Food and Nutrition Subcommittee, the researchers made final revisions to the content and format of the survey instrument.

The final survey instrument included 12 demographic items, 30 professional development topic items, 12 professional development format items, 10 items concerning preferred delivery modes for professional development, and 1 item on the priority the participant assigned to his/her own continuing professional development.

**Research Sample.** The research sample consisted of 1,083 participants drawn at random from a national database containing names and addresses of school foodservice directors. Random sampling from this database involved assigning a number at random to each district foodservice director in the database, sorting the list by assigned number, and identifying the 1,083 directors with the lowest randomly assigned numbers. The sample size was established by estimating the number of responses needed to ensure the desired level of precision and warrant confidence in the resulting estimates of need, given the population size and anticipated response rate. Assuming a response rate similar to that observed in the pilot study (approximately 35%), the researchers estimated that a sample of approximately 1,000 to 1,100 would be needed to achieve the desired level of precision (i.e., sampling error no greater than ± 5% at a 95% confidence level).

**Data Collection.** The data collection procedure, which took place during November and December 1999, included an initial mailing of the survey instrument to the 1,083 school foodservice directors in the sample. Accompanying the survey was a letter from the Executive Director of NFSMI asking foodservice directors for their cooperation and assuring participants of complete confidentiality. By coding each survey form with a unique identification number, the researchers were able to determine which directors had responded. Those who did not respond within approximately three weeks were mailed a reminder to encourage participation.

**Data Analysis.** Following data collection, the researchers used SPSS, Version 8.0 and Microsoft Excel to compile and analyze results. The identification codes on the survey forms permitted the researchers to sort and analyze responses by USDA region. Complete data analysis steps included: 1) compilation of the number and percent of respondents selecting each response category; 2) chi-square analysis of the data to determine key relationships among demographic characteristics (e.g., region) and level of interest in professional development topics; and 3) development of a need index, a format preference index, and a delivery mode preference index as indicators...
### Table 1. Respondents’ ratings of professional development topics

<table>
<thead>
<tr>
<th>Professional Development Topics</th>
<th>Mean Rating*</th>
<th>% Much needed</th>
<th>% Somewhat needed</th>
<th>% Not a priority</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using computers for management (ordering, inventory control, financial management)</td>
<td>2.2</td>
<td>46%</td>
<td>28%</td>
<td>26%</td>
<td>316</td>
</tr>
<tr>
<td>Promoting nutrition awareness/education</td>
<td>2.2</td>
<td>34%</td>
<td>50%</td>
<td>16%</td>
<td>317</td>
</tr>
<tr>
<td>Keeping up-to-date with government regulations</td>
<td>2.2</td>
<td>35%</td>
<td>47%</td>
<td>18%</td>
<td>318</td>
</tr>
<tr>
<td>Managing budget issues (cost control, forecasting)</td>
<td>2.2</td>
<td>37%</td>
<td>41%</td>
<td>21%</td>
<td>318</td>
</tr>
<tr>
<td>Marketing/promoting the foodservice program</td>
<td>2.1</td>
<td>36%</td>
<td>40%</td>
<td>25%</td>
<td>317</td>
</tr>
<tr>
<td>Planning effectively to enhance program operations</td>
<td>2.0</td>
<td>30%</td>
<td>44%</td>
<td>26%</td>
<td>317</td>
</tr>
<tr>
<td>Offering adequate food choices, including low-calorie meals</td>
<td>2.0</td>
<td>28%</td>
<td>47%</td>
<td>24%</td>
<td>318</td>
</tr>
<tr>
<td>Using the Internet as an information access tool</td>
<td>2.0</td>
<td>37%</td>
<td>29%</td>
<td>34%</td>
<td>313</td>
</tr>
<tr>
<td>Maintaining variety in food served</td>
<td>2.0</td>
<td>31%</td>
<td>42%</td>
<td>27%</td>
<td>317</td>
</tr>
<tr>
<td>Using advances in equipment to increase food production efficiency</td>
<td>2.0</td>
<td>28%</td>
<td>44%</td>
<td>27%</td>
<td>314</td>
</tr>
<tr>
<td>Decreasing plate waste</td>
<td>2.0</td>
<td>25%</td>
<td>47%</td>
<td>28%</td>
<td>316</td>
</tr>
<tr>
<td>Dealing with a school foodservice image problem</td>
<td>2.0</td>
<td>27%</td>
<td>40%</td>
<td>32%</td>
<td>319</td>
</tr>
<tr>
<td>Involving students in meal planning (e.g., youth/Nutrition Advisory Councils)</td>
<td>2.0</td>
<td>25%</td>
<td>44%</td>
<td>30%</td>
<td>317</td>
</tr>
<tr>
<td>Purchasing food products (managing cost comparison, quantities, delivery times)</td>
<td>2.0</td>
<td>27%</td>
<td>41%</td>
<td>32%</td>
<td>316</td>
</tr>
<tr>
<td>Ensuring and documenting accountability</td>
<td>1.9</td>
<td>26%</td>
<td>42%</td>
<td>32%</td>
<td>317</td>
</tr>
<tr>
<td>Establishing/maintaining pleasant dining environments</td>
<td>1.9</td>
<td>25%</td>
<td>43%</td>
<td>32%</td>
<td>316</td>
</tr>
<tr>
<td>Networking effectively with other foodservice directors</td>
<td>1.9</td>
<td>25%</td>
<td>42%</td>
<td>33%</td>
<td>315</td>
</tr>
<tr>
<td>Using e-mail as a communication tool</td>
<td>1.9</td>
<td>30%</td>
<td>32%</td>
<td>39%</td>
<td>311</td>
</tr>
<tr>
<td>Training employees in team-building and motivational strategies</td>
<td>1.9</td>
<td>20%</td>
<td>50%</td>
<td>30%</td>
<td>315</td>
</tr>
<tr>
<td>Balancing meal prices with student participation</td>
<td>1.9</td>
<td>25%</td>
<td>41%</td>
<td>35%</td>
<td>317</td>
</tr>
</tbody>
</table>

Continued on page 92.

### RESULTS AND DISCUSSION

A total of 328 (30%) of the 1,083 directors in the sample completed and returned their survey forms. An additional 16 (1.5%) surveys mailed were considered undeliverable by the U.S. Postal Service. The 30% response rate was somewhat low compared to the response rate of directors in Gregoire and Sneed’s (1994) study, in which 66% responded, perhaps due to the second letter and survey they mailed to non-respondents. However, based on the response rate of the pilot for this study, the researchers expected a lower response rate and therefore expanded the sample size to increase confidence in the results.

**Representation and precision of survey results.** The researchers analyzed the survey results to determine the extent to which the results could be generalized with some confidence to the broader population of all directors. Responses were first analyzed to determine whether respondents appeared to be representative of all U.S. school foodservice directors. This analysis centered on representation by region, a major consideration in examining overall representation of foodservice directors. Three regions (Mid-Atlantic, Midwestern, and Western) were somewhat under-represented, and two regions (Mountain Plains and Southeast) were somewhat over-represented in the sample. Results of a contingency table chi-square analysis ($\chi^2 = 12.029, df = 8, p = 0.061$) indicate that differences between the expected and actual regional distribution of responses were not significant at a 0.05 alpha level. Over all, based on the chi-square tests for significance, the researchers concluded that the...
Table 1. Respondents' ratings of professional development topics (continued)

<table>
<thead>
<tr>
<th>Professional Development Topics</th>
<th>Mean Rating*</th>
<th>% Much needed</th>
<th>% Somewhat needed</th>
<th>% Not a priority</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing a performance evaluation system</td>
<td>1.9</td>
<td>25%</td>
<td>40%</td>
<td>35%</td>
<td>318</td>
</tr>
<tr>
<td>Managing time effectively</td>
<td>1.9</td>
<td>24%</td>
<td>41%</td>
<td>36%</td>
<td>318</td>
</tr>
<tr>
<td>Obtaining and/or preparing training manuals for employees</td>
<td>1.8</td>
<td>22%</td>
<td>37%</td>
<td>41%</td>
<td>301</td>
</tr>
<tr>
<td>Training employees in efficient food production techniques</td>
<td>1.8</td>
<td>15%</td>
<td>49%</td>
<td>36%</td>
<td>303</td>
</tr>
<tr>
<td>Training employees to follow overall safety and sanitation regulations</td>
<td>1.6</td>
<td>16%</td>
<td>47%</td>
<td>37%</td>
<td>305</td>
</tr>
<tr>
<td>Managing issues related to the use of onsite kitchens</td>
<td>1.6</td>
<td>18%</td>
<td>43%</td>
<td>39%</td>
<td>314</td>
</tr>
<tr>
<td>Delegating responsibilities</td>
<td>1.8</td>
<td>17%</td>
<td>44%</td>
<td>39%</td>
<td>321</td>
</tr>
<tr>
<td>Recruiting/selecting school foodservice personnel</td>
<td>1.6</td>
<td>16%</td>
<td>40%</td>
<td>42%</td>
<td>319</td>
</tr>
<tr>
<td>Training employees in dealing effectively with school personnel and students</td>
<td>1.8</td>
<td>16%</td>
<td>44%</td>
<td>40%</td>
<td>306</td>
</tr>
<tr>
<td>Preparing written job descriptions</td>
<td>1.7</td>
<td>17%</td>
<td>40%</td>
<td>43%</td>
<td>321</td>
</tr>
<tr>
<td>Training employees in food safety (storage, cooling, heating, thawing)</td>
<td>1.7</td>
<td>15%</td>
<td>42%</td>
<td>42%</td>
<td>305</td>
</tr>
<tr>
<td>Dealing with environmental issues (water safety, waste handling, recycling)</td>
<td>1.7</td>
<td>15%</td>
<td>44%</td>
<td>42%</td>
<td>316</td>
</tr>
<tr>
<td>Handling media coverage of school foodservice</td>
<td>1.7</td>
<td>14%</td>
<td>36%</td>
<td>49%</td>
<td>316</td>
</tr>
<tr>
<td>Dealing with competition (fast food chains, school stores)</td>
<td>1.6</td>
<td>18%</td>
<td>30%</td>
<td>53%</td>
<td>318</td>
</tr>
<tr>
<td>Dealing with increased employee turnover and labor shortages</td>
<td>1.6</td>
<td>18%</td>
<td>25%</td>
<td>57%</td>
<td>319</td>
</tr>
<tr>
<td>Training employees in basic food preparation skills</td>
<td>1.6</td>
<td>10%</td>
<td>36%</td>
<td>54%</td>
<td>305</td>
</tr>
<tr>
<td>Verifying student eligibility for free or reduced-price meals</td>
<td>1.5</td>
<td>12%</td>
<td>28%</td>
<td>60%</td>
<td>313</td>
</tr>
<tr>
<td>Managing issues related to the use of central kitchens</td>
<td>1.5</td>
<td>10%</td>
<td>26%</td>
<td>64%</td>
<td>309</td>
</tr>
<tr>
<td>Addressing the need for written materials for non-English speaking employees</td>
<td>1.2</td>
<td>6%</td>
<td>6%</td>
<td>87%</td>
<td>308</td>
</tr>
</tbody>
</table>

*Weights: Much needed = 3; Somewhat needed = 2; Not a priority = 1

Survey responses were sufficiently representative of foodservice directors nationally to warrant confidence in using the survey results as a basis for planning for the broader population of directors.

Sample Demographics. Demographic information provided by the 328 respondents indicated several notable findings. Almost half of the respondents worked in districts with fewer than 1,000 students, and a total of 86% worked in districts with 5,000 students or less. The National Center for Educational Statistics (NCES) reported that in 1994-95, the most recent year for which school district enrollment data are available, 93% of all U.S. school districts enrolled 5,857 students or fewer.

Most (70%) of the respondents supervised one to three site managers, while another 23% supervised four to 10 site managers. The majority (73%) of the respondents indicated that their staff positions are relatively stable, changing less than 5% each year. Almost half (47%) of the respondents had 11 or more years of experience as school foodservice directors.

Almost half (49%) of the respondents reported that their districts had more than 71% student participation rates in their school foodservice program. More than one-half (52%) of the respondents expected no change in the participation rate, while 40% expected an increase in the student participation rate in their foodservice program (excluding a la carte). Only 8% expected a decrease. Almost all (96%) of the respondents' districts participated in the National School Lunch Program (NSLP), and 70% of the districts participated in the School Breakfast Program (SBP). The overwhelming majority of respondents (94%) worked in self-operated districts, with 76% implementing onsite food preparation.

The majority (66%) of the responding district directors indicated they currently had Internet access, while another 22% indicated that they would have Internet access in their offices within the next year. Finally, 91% of the respondents reported that they would assign medium or high levels of priority to their own professional development.

Directors' Perceived Professional Development Needs. Survey results yielded a specific group of topics for which respondents expressed a relatively strong need for professional development. Analysis of survey results focused first on those professional development topics for which the need index was higher than 2.0. That is, the
Table 2. Respondents’ ratings of professional development formats

<table>
<thead>
<tr>
<th>Professional Development Format</th>
<th>Mean Rating</th>
<th>% Highly preferred</th>
<th>% Preferred</th>
<th>% Not preferred</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hands-on workshops</td>
<td>2.4</td>
<td>52%</td>
<td>35%</td>
<td>13%</td>
<td>313</td>
</tr>
<tr>
<td>Use of demonstrations (&quot;how-to&quot; sessions)</td>
<td>2.4</td>
<td>52%</td>
<td>35%</td>
<td>13%</td>
<td>318</td>
</tr>
<tr>
<td>Focus on timely topics (e.g., new temperatures for meats and poultry)</td>
<td>2.3</td>
<td>42%</td>
<td>42%</td>
<td>16%</td>
<td>314</td>
</tr>
<tr>
<td>Inclusion of practical information in the session</td>
<td>2.2</td>
<td>43%</td>
<td>35%</td>
<td>22%</td>
<td>310</td>
</tr>
<tr>
<td>Use of printed handout materials</td>
<td>2.2</td>
<td>37%</td>
<td>45%</td>
<td>18%</td>
<td>317</td>
</tr>
<tr>
<td>Active involvement in the sessions by participants</td>
<td>2.1</td>
<td>31%</td>
<td>47%</td>
<td>22%</td>
<td>312</td>
</tr>
<tr>
<td>Use of live speakers who are experts in a relevant field</td>
<td>2.0</td>
<td>38%</td>
<td>26%</td>
<td>36%</td>
<td>317</td>
</tr>
<tr>
<td>Use of other directors as session leaders</td>
<td>1.9</td>
<td>23%</td>
<td>48%</td>
<td>30%</td>
<td>313</td>
</tr>
<tr>
<td>In-depth explanations of theories behind practices</td>
<td>1.8</td>
<td>20%</td>
<td>43%</td>
<td>38%</td>
<td>312</td>
</tr>
<tr>
<td>Large rooms for break-out sessions</td>
<td>1.8</td>
<td>16%</td>
<td>42%</td>
<td>42%</td>
<td>313</td>
</tr>
<tr>
<td>Use of teleconferences that allow questioning</td>
<td>1.6</td>
<td>12%</td>
<td>35%</td>
<td>54%</td>
<td>313</td>
</tr>
</tbody>
</table>

*Weights: Highly preferred = 3, Preferred = 2, Not preferred = 1

Researchers first looked at those items for which the mean response was between “somewhat needed” (2.0) and “much needed” (3.0). Table 1 provides a summary of top-ranking professional development topics, as well as preferred formats and delivery modes. Professional development needs are discussed below in order of the priority assigned to topics.

Based on respondents’ ratings, the topics with the highest need index (2.2) were using computers for management (ordering, inventory control, financial management), promoting nutrition awareness/education, keeping up-to-date with government regulations, and managing budget issues (Table 1). Of these, the need for specific types of computer-related skills was rated as “much needed” by 46% of the respondents. 9% more ratings of “much needed” than did the two topics receiving the next greatest number of “much needed.” One of those two topics was “Using the Internet as an Information Access Tool,” which was rated as “much needed” by 37% of the respondents. These statistics seem to indicate that computer training is a widely desired topic for professional development sessions. However, attention should be given to the fact that the topics listed address specific types of computer usage rather than a broad introduction to using computers.

The topics promoting nutrition awareness/education (mentioned earlier) and marketing/promoting the foodservice program had need indices of 2.2 and 2.1, respectively, and were rated as “much needed” or “somewhat needed” by a total of 84% and 76% of the respondents, respectively. From these statistics, it appears that foodservice directors are interested in taking an active role in educating students, parents, teachers, and others about nutrition and about the foodservice program offerings within the school district. This finding is especially interesting when contrasted with Greigore and Sneed’s (1994) finding that nutrition education, along with professional development, were rated least important by directors/supervisors. Perhaps this change in the interest to more actively educate others is due to a greater focus on nutrition in school meals since the completion of School Nutrition Dietary Assessment study in 1993 and the implementation of the School Meals Initiative.

Other high-priority topics with a need index rating of 2.0 were as follows: planning effectively to enhance program operations; offering adequate food choices, including low-calorie meals; using the Internet as an information access tool; maintaining variety in food served; using advances in equipment to increase food production efficiency; decreasing plate waste; dealing with a school foodservice image problem; involving students in meal planning; and purchasing food products. All 14 topics with a need index greater than 2.0 were rated as “much needed” or “somewhat needed” by at least 66% of the respondents.

Also, it is important to note the topics that respondents rated extremely low in priority. As Table 1 shows, more than 50% of the respondents rated the following topics as “not a priority”: dealing with competition (fast food chains, school stores); dealing with increased employee turnover and labor shortages; training employees in basic food preparation skills; verifying student eligibility for free or reduced price meals; managing issues related to the use of central kitchens; and addressing the need for written materials for non-English speaking employees.

There were some regional and experience-based differences in responses to several items. For example, the topic of dealing with increased employee turnover and labor shortages was considered a low priority by 57% of respondents. However, respondents in the Mid-Atlantic and Southeastern regions, as well as respondents with 21 to 25 years of experience, reported higher levels of interest in this topic. Other regional patterns emerged with regard to respondents’ ratings on professional development topics. In the Southeast, 79% of respondents indicated a need for training.
in obtaining and/or preparing training manuals for employees.

Alternately, respondents from the Mountain Plains indicated a relatively low level of interest in this topic, with only 36% expressing a need for training in this area. The Southeast region expressed a relatively high interest in managing time effectively (87%), dealing with a school foodservice image problem (85%), managing issues related to the use of onsite kitchens (80%), and dealing with increased employee turnover and labor shortages (55%). Thus, respondents from the Southeast expressed training preferences not always shared by other regions. However, respondents from the Mid-Atlantic region also expressed relatively high interest in the topic of dealing with increased employee turnover and labor shortages (50%) and dealing with a school foodservice image problem (76%). The latter topic was also of relatively high interest to respondents in the Northeast (71%) and the Southwest (73%).

**Directors' Professional Development Format and Delivery Mode Preferences.**

In addition to eliciting information on directors' needs for professional development in certain content areas, the survey also asked respondents to rate certain professional development formats and delivery modes. This information is useful for planning sessions that offer the learning environments preferred by directors.

The professional development formats most preferred were hands-on workshops and the use of demonstrations, both of which were highly preferred by 52% of the respondents (Table 2). The other formats preferred by respondents (receiving a preference rating of 2.0 or better) included: focus on timely topics; inclusion of practical information in the session; use of printed handout materials; active involvement in the sessions by participants; and use of live speakers who are experts in a relevant field.

The most preferred delivery modes included state agency-sponsored conferences/workshops (2.4) and theme-based seminars allowing for discussions with other directors (2.3) (Table 3). These theme-based seminars might be sponsored by several organizations, such as state agencies, professional organizations, or industry. The least preferred delivery modes (Table 3) were interactive teleconferences and instruction delivered via the Internet/World Wide Web. Interactive teleconferences were not preferred by 61% of the respondents. This was the only delivery mode for which more than half of the respondents expressed a lack of preference.

**CONCLUSIONS AND APPLICATION.**

The results of this survey indicate the potential of relevant, theme-based seminars for meeting many of the professional development needs of foodservice directors. These seminars would allow directors to meet together, network with each other, and gain new insights and perspectives from experts in the various need areas that are most important to the respondents in this study.

More specifically, these seminars might focus on the following issues:

(1) Using the computer as a management tool (focusing on the use of software and Internet sites that address management needs). Directors indicated that they wish to learn to use computers for management tasks such as ordering, inventory control, and financial management. In addition, computer training offers a way to address the need for managing budget issues such as cost control and forecasting. Further, directors have expressed a preference for training in using the Internet as an information access tool. In effect, most professional development topics in which directors are interested could be addressed, at least in part, through training in the use of various software packages and/or in the access of particular Internet sites related to the area of need.

(2) Using the computer as a training/promotional tool (focusing on the use of software and Internet sites to create educational and promotional materials). Computer training could be offered through hands-on sessions conducted in a computer lab with the appropriate software being used. In addition, training sessions should focus on specific applications of the software to meet the needs of directors. For example, desktop publishing software might serve as a means of training directors to develop brochures directed toward nutrition awareness and education and toward marketing and promoting the foodservice program. Internet sites for accessing the most recent government regulations and even for gaining assis-

**Table 3. Respondents' ratings of professional development delivery modes.**

<table>
<thead>
<tr>
<th>Professional Development Delivery Mode</th>
<th>Mean Rating</th>
<th>% Highly preferred</th>
<th>% Preferred</th>
<th>% Not Preferred</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>State agency-sponsored conferences/workshops</td>
<td>2.4</td>
<td>49%</td>
<td>38%</td>
<td>13%</td>
<td>313</td>
</tr>
<tr>
<td>Theme-based seminars allowing for discussions with other directors</td>
<td>2.2</td>
<td>43%</td>
<td>37%</td>
<td>20%</td>
<td>310</td>
</tr>
<tr>
<td>State school foodservice association conferences</td>
<td>2.2</td>
<td>41%</td>
<td>39%</td>
<td>20%</td>
<td>312</td>
</tr>
<tr>
<td>Sessions sponsored by the foodservice industry</td>
<td>2.2</td>
<td>35%</td>
<td>45%</td>
<td>20%</td>
<td>311</td>
</tr>
<tr>
<td>American School Food Service Association conferences</td>
<td>2.1</td>
<td>35%</td>
<td>37%</td>
<td>29%</td>
<td>308</td>
</tr>
<tr>
<td>Video-based instruction</td>
<td>2.0</td>
<td>25%</td>
<td>51%</td>
<td>24%</td>
<td>312</td>
</tr>
<tr>
<td>Computer-based instruction (CD-ROM or disk)</td>
<td>1.9</td>
<td>28%</td>
<td>36%</td>
<td>36%</td>
<td>309</td>
</tr>
<tr>
<td>Courses offered by colleges/universities</td>
<td>1.6</td>
<td>24%</td>
<td>37%</td>
<td>40%</td>
<td>304</td>
</tr>
<tr>
<td>Instruction delivered via the Internet/World Wide Web</td>
<td>1.7</td>
<td>17%</td>
<td>35%</td>
<td>48%</td>
<td>306</td>
</tr>
<tr>
<td>Interactive teleconferences</td>
<td>1.5</td>
<td>9%</td>
<td>30%</td>
<td>61%</td>
<td>305</td>
</tr>
</tbody>
</table>

*Weights: Highly preferred = 3; Preferred = 2; Not preferred = 1*
tance with meal planning and calorie calculations also are possible avenues for helping directors gain this information.

(3) Promoting nutrition awareness among students, teachers, parents, and others in the community. Directors appear to be developing an increasingly greater role in promoting nutrition awareness and education among these various groups. Training in this area may occur through the use of hands-on workshops, with active involvement in the sessions by all participants. Through these workshops, participants would learn to identify resources available for working with teachers to promote nutrition awareness.

(4) Keeping informed of new government regulations that affect school foodservice. A relatively high priority among directors is keeping up-to-date with government regulations. This may be accomplished through workshops in which an expert presents new information and discusses its practical implications with workshop participants. In keeping with directors' preferences, handout materials would be useful as references to be kept by the participants.

(5) Managing the financial aspects of the school foodservice program. Professional development in the area of managing budget issues, including cost control and forecasting, presents an excellent opportunity for the use of experts in the field of financial management, particularly in the foodservice industry. Here it would be important for participants in this professional development seminar to have an opportunity to solve realistic problems related to budgeting and to discuss the advantages and disadvantages to various approaches. This avenue would meet the preference of survey respondents for practical, hands-on sessions using experts in financial management in school foodservice.

(6) Marketing and promoting the school foodservice program. Professional development that assists directors with marketing and promoting their foodservice program offers rich opportunities for using a variety of formats and delivery modes. Marketing specialists may prove valuable for this purpose. As in all areas, it will be important for directors to be given information about how to measure gains in student participation so that they may evaluate their marketing strategies and make any necessary changes in response to their evaluation.

(7) Exploring ways to enhance program operations. Most respondents expressed a need for professional development in planning effectively to enhance program operations. In this area, directors would likely derive much benefit from state, regional, and national conferences that focus on this topic. Interaction with other directors would provide an excellent means for gaining ideas that have proven effective for others. Ways of implementing effective programs in various settings should be explored.

(8) Learning how to broaden food choices. The need to offer adequate food choices, including low-calorie meals, and the need to maintain variety in the food served are concerns reported by respondents. Professional development in these areas may involve hands-on workshops in which participants are guided in the planning of menus. In addition, professional chefs and nutritionists may deliver expert advice in meal planning.

(9) Becoming acquainted with new equipment and its use in promoting efficiency in food production. Survey respondents expressed a need for professional development in utilizing advances in equipment to increase food production efficiency. In this area, vendors for certain equipment may be invited to demonstrate their products and to discuss optimal use of the equipment. As with all professional development sessions, primary focus should be on the presentation of practical, applicable information.

(10) Learning effective strategies for training staff on topics of high priority. There were a number of areas in which respondents desired training for their staff. In response to this need, avenues should be provided for training foodservice site managers in effective teaching techniques for use with their employees. Directors should then be informed of these training avenues so that they can refer their site managers to them.

In conclusion, district foodservice directors reported an interest in professional development that has a primary focus on practical, applicable information, with a high level of active involvement by participants. Many of the school foodservice directors' professional development needs might best be met by relevant theme-based seminars that give them the opportunity to meet together and network with each other, as well as to gain new insights and perspectives from experts in the various need areas that surfaced as most important to the respondents in this study.

ACKNOWLEDGEMENTS
This study was conducted by the Center for Educational Research and Evaluation, School of Education, University of Mississippi. This project has been funded at least in part with federal funds from the U.S. Department of Agriculture (USDA) to the National Food Service Management Institute, the University of Mississippi. The contents of this report do not necessarily reflect the views of policies of the USDA, nor does mention of trade names, commercial products or organizations imply endorsement by the U.S. government.

REFERENCES
Child Nutrition Program Managers' and Directors' Perceptions of Managers' Training Needs Differ

Olivia W. Kendrick, DrPH, RD; and Veena Gangadharan, MS, RD

We compared child nutrition program managers' and directors' perceptions of the managers' training needs within a Southeastern state by conducting surveys of each group. Due to a large difference in sample sizes between the two groups (88 directors and 1,071 managers), we used three statistical tests to measure differences in perceptions. We selected a random sample of 88 managers to use in the third statistical analysis. All three tests yielded similar results—managers perceived their need for training to be less than directors.

Approximately one-third of the directors indicated their school system on the questionnaire. When we controlled for school system in this group, differences in perceived needs between directors and managers disappeared. If this finding holds true throughout the state, then statewide training may need to focus on new policies and/or technologies, allowing most of the training to occur at the district level. With the increased availability of Internet access and educational opportunities on the Internet, it may be more cost effective in the future to provide individualized training that meets the needs of managers through distance education. Competency-based tests with instructions could be made available on the Internet so managers could assess their training needs and complete appropriate training modules.

The U.S. Department of Agriculture (USDA) Food and Nutrition Services (FNS) operated the Nutrition Education Training (NET) Program to support nutrition education in the food assistance programs for children, which includes the National School Breakfast and Lunch Programs (NET Program, 2000). In 1997, NET funding became discretionary and in 1999 no funds were appropriated for NET. The USDA's NET Program goal was to establish nutrition education as a major educational component of all child nutrition programs (CNPs) offered in all schools, child-care facilities, and summer sites (Guidelines for School Healthy Programs, 1997).

CNPs are mainly concerned with providing healthful, tasty, and nutritious meals for children, while the NET program provides the necessary training in foodservice management for program personnel who are responsible for providing these nutritious meals. Equally important was NET's role in teaching children, teachers, caregivers, and parents about the relationship between food and health (NET Program, 1998).

In today's dynamic environment, CNPs constantly are exposed to changes in economy, legislation, technology, customers, and nutrition information (Sneed & White, 1993). Therefore, it is essential that school administrators, foodservice managers, and directors become aware of these changes and are prepared to work in the changing environment. The foundation for a successful school foodservice program is based on the knowledge, skills, and abilities of its employees (Demico et al., 1994).

In Alabama, the NET program mainly focused its effort on nutrition education, nutritious meal service, leadership, and marketing through media. Numerous strategies were planned to achieve these objectives (Kendrick, 1998). First, a comprehensive needs assessment of the Alabama NET program was conducted in 1994 (Robinson & Hamilton, 1994). Both the CNP directors and managers participated by identifying needs for training in several areas. Following this, the Alabama State Department of Education contracted with the College of Human Environmental Sciences (CHES) to conduct an evaluation of the NET program in the summer of 1998 to determine the extent to which these training needs were met.

The 1998 NET evaluation included a survey of CNP managers, analysis of food purchasing records, and focus groups of the Alabama CNP Board of Advisors and selected groups of managers. Both qualitative and quantitative data were gathered for this evaluation. Since the directors of the CNP were not part of that survey, this proposed study was conducted to elicit their perceptions of the areas that their managers required training (Kendrick, 1998).

We conducted this study to compare the training needs perceived by the directors of CNPs with that of the training needs perceived by the managers in NET workshops. Our ob-

Olivia Kendrick is associate professor, Department of Human Nutrition and Hospitality Management, University of Alabama, Tuscaloosa, Ala. Veena Gangadharan was a graduate student at the University of Alabama, Tuscaloosa, Ala., when this work was completed.
jectives were to identify the training needs of managers as perceived by the CNP directors and to compare the training needs identified by the CNP directors with those of their managers.

**METHODOLOGY**

We conducted two surveys for this study. One survey was of CNP managers and the other was of directors. The University of Alabama Institutional Review Board for the Protection of Human Subjects in Research approved the study prior to data collection. The only identifying information requested of recipients was school system code, a four-digit code used by the State Department of Education to identify schools within a district.

**Managers’ Survey.** We developed written questionnaires for both the managers’ and directors’ surveys. Our questionnaires were based on a needs assessment of the CNP conducted in 1994 (Robinson & Hamilton, 1994). Four managers in Tuscaloosa County, Ala., pilot tested the questionnaire before it was used statewide. The managers’ survey consisted of two major components: a two-page Scantron® sheet with approximately 143 close-ended questions and one page that consisted of three open-ended questions.

Part I of the questionnaire, a series of 21 questions that addressed managers’ perceptions of training needs, provided the data for this study. The remainder of the questionnaire focused on managers’ retention of knowledge and use of materials from workshops sponsored by the state since 1994. In June 1998, trainers who attended the statewide CNP managers’ workshops asked all of the managers in attendance to complete the questionnaire. A minimum of 30 minutes was provided during the workshops to complete these questionnaires. They distributed questionnaires to 1,072 managers.

**Directors’ Survey.** The directors’ questionnaire consisted of four parts. Part I had nine questions that elicited demographic information of the respondents. Part II consisted of 30 items that described various areas in which child nutrition managers might need training and asked the directors to rate the items on a five-point scale (1=needs training and 5=does not need training). Managers also could indicate not applicable. Part III consisted of 25 questions that asked respondents to indicate if the foodservice procedures listed were carried out in school districts. The choices on these items were: all schools, some schools, few schools, none of the schools, and not applicable.

Part IV of the questionnaire was qualitative and had two open-ended questions with sufficient space for the respondents to write their comments. The questionnaire required 10 to 15 minutes to complete. This study used only Part I of the managers’ survey and Part 2 of the directors’ survey for the purpose of comparing the reported training needs of managers.

In Fall 1998, we administered the questionnaires to all CNP directors at the statewide annual meeting in Tuscaloosa. Di-
rectors received the questionnaire, a cover letter explaining the purpose of the study, and a self-addressed postage-paid envelope for returning the questionnaire. They were asked to complete the questionnaire and return it to us at the end of the meeting or mail it to us using the postage-paid envelope. Since the response rate was less than expected, we sent a second letter with a duplicate questionnaire to all non-respondents during Spring 1999.

Data Analysis. We used SPSS PC (9.0) for data analysis. We calculated frequencies and percentages for each of the demographic questions. We measured the directors' perceptions of the training their managers needed with 30 questions that were answered on a five-point scale. We converted their responses into two categories: responses 1, 2, and 3 were grouped together to indicate needs training and 4 and 5 were grouped to indicate does not need training. Not applicable was omitted. In order to compare the directors' and managers' perceptions of training needs, we used the 21 questions that were identical on the two questionnaires. We compared the frequency and percentage of responses of the directors and the managers. We tested internal consistency (reliability) of the questionnaires for both the managers and directors using the Cronbach’s alpha.

We used one-way analysis of variance (ANOVA) to determine whether managers and directors within a single school district perceived the training needs differently. We used a chi-square non-parametric test to see if there were significant differences between the training needs of managers as perceived by the managers and directors when those perceptions were expressed in two categories: needs training and does not need training.

Since there are many more managers than directors in the state's CNP, the number of persons in each of the two groups who responded to the survey was varied. In fact, managers completed more than 10 times the number of questionnaires than did directors. Statistical tests, such as ANOVA and t-tests, are based on the assumptions of similar numbers in each group (Heiman, 1992).

In order to achieve equal numbers in the two groups, we used SPSS 9.0 to randomly select questionnaires of 88 managers to match the 88 completed questionnaires we had from directors. Since the managers’ questionnaire did not have a not applicable option, we excluded those answers from the directors' data and treated them as missing, which made the scales from two different studies comparable. The five items were summed for each question and the managers' and directors' responses were compared using an independent-samples t-test. We used an alpha level of 0.01 for all tests of significance to compensate for the design effect of the survey.

RESULTS AND DISCUSSION

We distributed 150 director surveys and received 101 completed surveys for a response rate at 67%. Of those, 88 (87%) indicated that they were CNP directors and only these were included in the study.

There were 1,072 managers who attended the workshops held in June 1998. We received 1,071 completed questionnaires. The characteristics of the samples of directors, managers, and the random sample of managers are summarized in Table 1.

Reliability of the Scales. The Cronbach's alphas for the managers' and directors' questionnaires were 0.91 and 0.92, respectively. The managers' questionnaire had 21 training needs identified while the directors' questionnaire had 30 items. When the items that were added to the directors' questionnaire were removed and only 21 training needs were included, the Cronbach's alpha for the directors' questionnaire was 0.90. The high Cronbach's alpha coefficients indicated a high internal consistency.

<table>
<thead>
<tr>
<th>Training needs statements</th>
<th>Directors (n = 88)</th>
<th>Managers (n = 1071)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modify recipes to reduce fat, sugar, and salt</td>
<td>78.4</td>
<td>39.6</td>
</tr>
<tr>
<td>Improving productivity in the school kitchen</td>
<td>77.3</td>
<td>28.5*</td>
</tr>
<tr>
<td>Evaluating new food products</td>
<td>67.0</td>
<td>30.8</td>
</tr>
<tr>
<td>Planning menus that conform to the Dietary Guidelines</td>
<td>60.2</td>
<td>31.7*</td>
</tr>
<tr>
<td>Motivating employees</td>
<td>81.8</td>
<td>34.5</td>
</tr>
<tr>
<td>Discussing current nutrition issues with teachers, students, parents, and administrators</td>
<td>78.4</td>
<td>43.2*</td>
</tr>
<tr>
<td>Team-building with CNP employees</td>
<td>76.1</td>
<td>29.7*</td>
</tr>
<tr>
<td>Serving students with special nutrition needs</td>
<td>59.1</td>
<td>33.5*</td>
</tr>
<tr>
<td>Evaluating on-the-job-performance and giving employees feedback</td>
<td>69.3</td>
<td>32.2*</td>
</tr>
<tr>
<td>Planning and conducting small group training or meetings with CNP employees</td>
<td>65.9</td>
<td>31.4*</td>
</tr>
<tr>
<td>Training and supervising employees to maintain food quality</td>
<td>72.7</td>
<td>28.6*</td>
</tr>
<tr>
<td>Understanding basic nutrition information</td>
<td>70.5</td>
<td>24.2*</td>
</tr>
<tr>
<td>Managing time</td>
<td>80.7</td>
<td>26.9*</td>
</tr>
<tr>
<td>Merchandising food on the cafeteria line</td>
<td>76.1</td>
<td>27.5*</td>
</tr>
<tr>
<td>Marketing Child Nutrition Program in school</td>
<td>78.4</td>
<td>34.6</td>
</tr>
<tr>
<td>Planning and conducting on-the-job-employee training</td>
<td>73.9</td>
<td>28.9*</td>
</tr>
<tr>
<td>Setting goals and evaluating the foodservice department</td>
<td>72.7</td>
<td>26.1*</td>
</tr>
<tr>
<td>Converting standardized recipes for needed quantities</td>
<td>68.2</td>
<td>30.5*</td>
</tr>
<tr>
<td>Planning menus to include a variety of choices within meal pattern</td>
<td>59.1</td>
<td>23.2*</td>
</tr>
<tr>
<td>Calculating food cost and labor cost per meal</td>
<td>65.9</td>
<td>39.4</td>
</tr>
<tr>
<td>Planning menus using USDA food based menus</td>
<td>59.1</td>
<td>23.2*</td>
</tr>
</tbody>
</table>

*Significantly different at p<0.01
of responses to the items. In other words, individual managers and directors responded in a similar manner throughout the questionnaire. These high scores tell us that respondents either thought that managers needed training in several areas or they thought that they needed very little training (Heiman, 1992).

**Comparison of Perceptions of Managers’ Training Needs.** Using ANOVA to compare responses of managers and directors to the questions of managers’ training needs rated on the five-item scale, we found statistically significant differences between the directors’ perception of managers’ training needs and the managers’ perception of need for all of the 21 items. In all instances, directors believed there was a greater need for training than did managers. When we grouped responses by school system codes and comparisons were made among the school systems, these differences disappeared. Eighty-five of the 128 (66%) school system codes were missing; therefore, we could not perform this analysis for most of the school systems. However, since there were no differences between directors’ and managers’ opinions about managers’ training needs within the school systems for which complete data were available, it may be that training needs vary by school system within the state and that within each school system the director and managers agree on their needs.

When the five-item scale was collapsed into two categories, needs training and does not need training, and compared for directors and managers using the non-parametric chi-square test, we found significant differences between the two groups for 17 of the 21 training needs listed. As stated earlier, directors perceived a greater need for training than did managers (Table 2).

We compared the responses of the directors to training needs of the managers with those of the random sample of 88 managers. We found that there were statistically significant differences between the directors’ and managers’ perceptions of the managers’ training needs for 9 of the 21 items. For all items that were different, directors believed that there was a greater need for manager training than did the managers (lower means indicate a greater need for training)(Table 3).

**CONCLUSIONS AND APPLICATION**

This statewide study compared perceptions of CNP directors and managers about the training needs of managers. Due to a large difference in sample size of the two groups, we utilized three statistical tests to measure difference in perceptions. We selected a random sample of managers for use in the third test to account for differences in sample size. Table 4 contains a summary of the three tests. All three tests yielded similar results—managers perceived their need for training to be less than did directors.

School foodservice is one of the largest businesses in the United States. Clearly, the industry needs strong, professional, and qualified managers to assure that child nutrition program goals are met in a cost-effective manner (DeMiceco et al., 1994). We found little-to-no agreement in manager training needs as assessed by managers and their directors. In all instances where differences were significant, directors assessed the needs to be greater than did managers.

Based on approximately one-third of the school systems, this difference in percep-
Table 4. Differences in training needs as perceived by directors and managers measured using different statistical tests

| Training Needs Statements                                      | ANOVA | Non-parametric Chi-square test | Independent Sample T-test
<table>
<thead>
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*Significantly different at p<0.01 level
*Random sample of managers

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rectors. If this finding holds true throughout the state, then statewide training may
need to focus on new policies and/or technologies, allowing most of the training to oc-
cur at the district level. With the increased availability of Internet access and educa-
tional opportunities on the Internet, it may be more cost effective in the future to pro-
vide individualized training that meets the needs of managers through distance educa-
tion. Competency-based tests with instructions could be made available on the Inter-
net so managers could assess their training needs and complete appropriate training
modules.

The CNP operates in a dynamic environment, resulting in continually changing edu-
cational needs. These needs must be eval-
uated on an ongoing basis (Sneed & White, 1993). Further studies should be con-
ducted, which include data from both man-
agers and directors with school system codes so that differences within systems can be accounted for. The use of technologi-
ically advanced training methods need to be evaluated to determine if they are more effec-
tive and efficient than the traditional state-wide or district-wide training that often
is provided.

ACKNOWLEDGEMENTS
This research was partially funded by the Al-
abama State Department of Education.

REFERENCES


Child Nutrition Showcase Abstracts
From ASPSA's 55th Annual National Conference

Innovative Facility Design


Dickinson High School students are greeted with abundant choices, fast service, and state-of-the-art merchandising when they dine at the Marketplace at Gator Center. Our newly renovated cafeteria features nine serving lines with serving station themes that reflect our locale on the beautiful Texas Gulf Coast. Bayou Country Cookery serves up an array of favorites, including chicken fried steak, chicken wings, and oven-fried chicken. La Gartos, named for the school's alligator mascot, features such area favorites as burritos, several varieties of nachos, enchiladas, taco salad, or fajita chicken salads. Customers' self-serve side dishes include such items as spicy beans, Mexican rice, and cornbread.

Gator Fresh Express is a self-serve unit featuring chef or Caesar salads, chicken or tuna salad boxes, a variety of deli sandwiches, Texas toast grilled cheese sandwiches, or baked potatoes with all the trimmings. Side dishes of soup, salads, fruit, and gelatin complete the spread. Or walk over to the other side of the cafeteria and help yourself to variety of baskets including fish, shrimp, or spicy popcorn chicken. Milk is available on all lines, or diners can choose an a la carte beverage from a variety of self-serve beverage dispensers.

In the dining room, students can gather at tables that fit four rounders that fit eight, or they can dine on bar stools that accommodate up to 12. Other seating choices include leather-seated booths or one of four computer stations! Strategically placed television monitors on overhead mounts promote school safety as students relax with their friends. A deluxe lighting and sound system allow for transformation of the cafeteria into a first-class party location. A large projection screen housed in the ceiling can be suspended for movies or presentations.

Additionally, child nutrition high school staff are delighted with their expanded cooler and freezer space. Two large storerooms allow ample space for groceries, as well as catering supplies. An in-house laundry room allows staff to have an unending supply of clean kitchen linens.

Dickinson Gators welcomed the opening of their new C-Store in the spring semester. This full-scale convenience store, located adjacent to the cafeteria, features an assortment of school spirit items including tee shirts, key chains, and sports bottles. A full line of snack items and ice cream products line additional shelves and merchandisers. Cappuccino and fountain drinks are available from self-serve dispensers. The C-store will offer specialty items, such as birthday mementos, Valentine gifts, and Homecoming memorabilia. School clubs and organizations will be able to use the store for fund-raising activities.

Our $1.4 million renovation, funded primarily with child nutrition money, opened in August 2000. A 100% increase in daily deposits and doubled participation are evidence that students love their new cafeteria with abundant food choices!

Marketing and Customer Service

Promotions & Marketing Through the Year. Munson, B., & Turley, J., Ogden City Schools, Ogden, Utah.

We have used various promotions to increase participation and awareness of our child nutrition program. We always see participation increase when we sponsor events. This year we had a Patriotic Day on the day of the presidential election. And for Thanksgiving we had a huge, old-fashioned feast where each class is a family unit. The meal served family style, including a whole turkey carved at each table. We also had a Hawaiian Luau complete with palm trees and grass skirts. We just finished our Mardi Gras celebration—a huge success. We get a lot of support from our administrator, faculty, staff, students, and parents. Any time we can get people to have fun, we have an opportunity to teach child nutrition.


The purpose of this project was to design an ice cream flavor for Edith Bowen Elementary lab school at Utah State University (USU). Two senior dietetics students designed this project for a senior practicum. Utah State, a land grant university, has made ice cream on site since 1888, and is home of the famous "Aggie Ice Cream." The goal of this project was to have individual classes at Edith Bowen Elementary decide what flavors would be best for the ice cream.

One class took the process a step further and surveyed college students at USU on their opinion of a good ice cream flavor for the school. Once all of the surveys were in from both elementary students and college students, several taste panels were conducted. As a result, two different flavors were developed: S'mores and peanut butter and jelly. Further extensive taste panels were conducted using these two flavors to decide which one was the best.

The panels consisted of Edith Bowen students, USU students, and USU faculty. The taste panel concluded that peanut butter and jelly was the best flavor. Many people voted a lot of time and effort to make the
perfect combination of peanut butter, raspberries, Reese's peanut butter cups, and ice cream. The final name of the ice cream was Jam'n Peanut Butter Boogie. This was a great opportunity for the University, college students, elementary students, and faculty. The product now is produced and sold at USU.

Local Celebrities “Team Up” to Promote School Lunch. Chong, C., & Rodon-Ramirez, D., Miami Dade County Public Schools, Miami, Florida.

Local celebrities were invited to participate in National School Lunch Week festivities during October 9-13, 2000. The intended outcome of this marketing technique was to increase school lunch participation at the elementary, middle and high school levels. Due to the fact that children tend to admire and respect local celebrities and emulate their favorite role model, the Department of Food and Nutrition invited some local celebrities who would leave a positive impression about nutrition and achievement. They were invited to have lunch with students and/or speak with them on the importance of eating a nutritious meal to attain success and “be the best that they can be.”

Among those local celebrities who visited the schools were:

1) “Billy” the marlin mascot for the Florida Marlins baseball team ate lunch with students at Lorah Park Elementary. The event was broadcasted during the local news that evening.

2) Joaquín González and Howard Clark, University of Miami football players, ate school lunch with students at North Miami Middle School. The athletes spoke to the students about how and why nutrition plays an important role in performance in sports. The students related well to them because they were perceived as role models, still attending school and playing a popular, college level sport.

3) Dr. Deanna Lites, a news reporter for CBS-Channel 4, WFOR, interviewed students at Brevard Senior High and Bent Tree Elementary Schools about school food choices. A feature segment was on the news during National School Lunch Week. The food lines featured an array of colorful and healthy food choices that school cafeterias offer. Similarly, Christina Gonzalez, a news reporter for ABC-Channel 10, WPLG, spoke to students at Shenandoah Middle School about the correlation between nutrition and success.

This type of marketing technique can be applied in future promotions throughout the school year.

School Meals Fill a Dieter’s Dilemma. Chong, C., Pernas, H., & Rodon-Ramirez, D., Miami Dade County Public Schools, Miami, Florida.

The purpose of this program is to promote healthy weight loss for school employees through healthy school breakfast and lunch meal choices. The target market were the school employees at Pine Lake Elementary School, where a foodservice manager has started a “Healthy Eating at School” program. This program incorporates school breakfast and lunch choices into a healthy weight loss management program for school employees.

A group of 18 participants meet weekly to learn about how making healthy food choices and being active can lead to successful weight loss. Participants are able to choose from a selection of healthy breakfast and lunch menu items that are offered in the school cafeterias. The “Healthy Eating at School” program has been very successful during the six weeks of implementation. A total of 46 pounds has been shed at the school so far and still counting down. Promoting healthy eating in the cafeteria can increase school meal participation rates, as well as result in happier and healthier customers.

This program will be applied to all 350 plus Miami Dade County Public Schools to increase school meals participation rates and produce healthier customers.


This project’s purpose is to increase customer service and obtain valuable program data through the use of a survey on the Army & Air Force Exchange Service (AAFES) school meal program. AAFES provides school meals in 185 Department of Defense schools located on military installations in 11 countries overseas.

Students, parents, community leaders, and school officials needed a method to communicate their comments and questions regarding the school meal program at their location. The staff dietitian developed a customer service survey on the school meal program Web site to accommodate this need and to gather valuable program data from these educationally dispersed schools.

Many school meal programs have a Web site. Most of these sites provide an e-mail address for customer comments. Surveys for customers to evaluate the school meal program and provide comments are not commonly found.

The AAFES customer service survey consists of 11 questions about the quality of food and service provided. Respondents can type additional comments about the school meal program at their location. The survey is successfully educates customers about the school meal program and allows them to provide suggestions or comments. Success is measured by the amount of completed surveys, positive customer feedback, and increased participation in the school meal program.

This project is easily adaptable to any school meal program Web site. Costs to add a customer service survey to an existing Web site are low, making it an exceptional way to communicate with customers and obtain valuable feedback about the school meal program.


Target your customers and they will respond! This philosophy describes the powerful promotion program in Aldine ISD. Our purpose is to create, increase, and maintain high participation. Students at grade levels are targeted (early childhood to high school) through many methods. A promotion committee comprised of supervisor, manager, and employee members on a rotating basis create the planned promotions for an entire school year. Each school is required to conduct one planned and one independent promotion every month with documentation for each. Each promotion is age and grade level appropriate. Types of promotions are based on current foodservice trends, planned events (Texas and National School Breakfast and Lunch Weeks), new products, nutrition education, limited time offers, student planned menus, school calendar events, and customer involvement. We strongly believe involvement with our customers creates an environment of satisfaction, response, and high participation.
Nutrition Education and Training


The purpose of this project was to train elementary school foodservice employees to lower fat, saturated fat, and sodium in school lunch, while still maintaining essential nutrients and student participation. School foodservice employees, from district level managers to cooks, were the target market.

The Eat Smart Program is the nutrition component of a coordinated school health program called CATCH (Coordinated Approach to Child Health), which is the dissemination version of the Child and Adolescent Trial for Cardiovascular Health. The Texas Department of Health funded CATCH to provide school health materials and trainings to schools throughout Texas as part of an effort to prevent risk factors for Type 2 diabetes in children. Eat Smart was designed to provide children with meals that met dietary guidelines for fat, saturated fat, and sodium, as well as to coordinate with the classroom curriculum, physical education, and family components of CATCH.

The Eat Smart training focuses on four target areas: planning menus, food purchasing, food preparation, and promotion. It also focuses on the “Eat Smart Guidelines,” which provide participants with concrete methods to lower fat, saturated fat, and sodium in school meals. These guidelines are presented to each cafeteria on a poster, where they can track their progress toward meeting the Eat Smart goals. Cafeterias are encouraged to make changes gradually, which facilitates the success of the program. In addition, cafeteria staff are urged to coordinate their efforts with other CATCH activities that are taking place during PE and in the classroom.

During 2000-01, approximately 20 Eat Smart trainings were conducted throughout Texas. Challenges in conducting the trainings include: adapting the training to a wide variety of learners, e.g., directors to cooks; language difficulties, especially with cooks; and scheduling the training sessions. Successful elements of the training include: hands-on activities; discussing barriers to implementing the program and problem solving; and coordinating the foodservice effort with the other components of CATCH.

As an application for other child nutrition programs, the Eat Smart training could serve as a model for training foodservice workers as part of a coordinated school health team. The training is interactive and conducted in a small group setting. Participants gain the knowledge and skills needed to begin immediate program implementation.


The purpose of this study is to investigate the effect of using “hands-on” participatory or visual exercises to reinforce classroom presentations (innovative delivery method) vs. straight lecturing and written information (traditional delivery method) on nutrition knowledge and food behaviors. Second-grade students were the target market of this study.

An eight-week intervention study was performed using two different nutrition education delivery methods (innovative vs. traditional). A pre- and post-test, along with food intake records, will be completed to assess changes in nutrition knowledge and food behavior of 2nd-grade students. The information gathered in this study will help nutrition educators recognize which nutrition education delivery method is most effective in promoting positive changes in children’s nutrition habits. Effective nutrition education programs will help children understand the importance of achieving healthy eating habits and physical activity patterns that will enable them to attain proper body weights and prevent long-term health problems.

Using innovative, instructional techniques may help future nutrition education programs to become more effective, enabling children to improve their nutrition knowledge and food behaviors.

Evaluation of Nutrient Quality of School Lunch: Comparison by Characteristics of Schools and Menu Planners. S., & Hiemstra, S.J., Purdue University, West Lafayette, Indiana.

The objective of the study was to compare the nutrient contents among schools grouped by the school enrollment and the menu planners’ education level. Menu planners in 425 school corporations in Indiana were surveyed. The total response rate following two mailings was 61% (251/425). About half of the survey response group (n=124) was willing to provide the researchers one week’s menus and recipes.

The researcher selected 18 school corporations by stratified random sampling based on the school enrollment and the menu planner’s education level. The nutrient content of one-week planned menus for each of the 16 school corporations was determined using NutriKidSTM. The menus exceeded the Recommended Dietary Allowances (RDAs) for all nutrients, except energy. The school lunches exceeded the Dietary Guidelines for Americans (DGA) goals for fat and saturated fat. Although the National Research Council (NRC) recommendations for nitrogen also were exceeded, the NRC recommendations for cholesterol were met. The percentage of schools meeting the DGA for total fat was significantly associated with school enrollment sizes, but not with the menu planner’s education level.

The menu planner’s education level did not affect the percentage of nutrients served. Results did not support the hypotheses that the education level of the menu planner influences the nutrient quality of the planned menus. Since menu planners are required to attend training on U.S. Department of Agriculture (USDA) regulations and menu planning requirements, results of this study may illustrate the importance of these workshops and training materials provided by USDA. A larger sample size also might have been helpful in measuring the importance of education level of menu planners.

Healthy School Meals Resource System Database. Regan, K.S., & Stapley, D., Food and Nutrition Information Center, National Agriculture Library, Beltsville, Maryland.

The Healthy School Meals Training Materials Database is produced by the Healthy School Meals Resource System (HSMSRS), which was developed as a component of Team Nutrition to implement the School Meals Initiative. The HSMSRS Database is a compilation of training and education materials for school foodservice and child nutrition personnel and educators. Dietitians with subject matter
expertise reviewed the materials in the database, including curricula, kits, manuals, and videos, for content and subject matter. The database is online and searchable and allows school nutrition personnel, trainers, and nutrition educators to easily locate appropriate and useful training and education materials, which may be borrowed from the National Agricultural Library or purchased directly from the producer.


The learning outcome of this project was to plan menus that will better serve the nutritional needs of school children by selecting color-coded menu cards.

In a search for a more efficient and effective time saving method to meet nutrition standards in menu planning, Arkansas developed the Three Steps to Healthy School Meals menu management system following the U.S. Department of Agriculture's (USDA's) Traditional Menu Planning Option. The system provides: 1) Color-coded menu cards; 2) Procurement by standardized food descriptions; and 3) Production records, standardized recipes, and presentation tips. The cards are color-coded according to the percentage of calories from fat in the menu. By using color combinations, menu planners are able to plan an entire week's menus and, when averaged, provide 30% of calories or less from fat.

Seventy-five school districts participated in a statewide student food preference survey, which measured children's likes and dislikes of 200 various food items. The surveys were administered to Arkansas school children in grades 3 to 12. Five hundred forty surveys were completed and returned. Recipes and menus were then developed by Arkansas child nutrition directors and tested in Arkansas schools incorporating the student's preferences. School district menu planners are trained to use the system, and create a set of color-coded menu cards unique to their district's preferences.

This system provides school child nutrition directors and their staff with a cost-effective way to reduce the amount of paperwork and labor required to produce a reimbursable meal, and improve current procurement practices while meeting fat reduction criteria.


Current findings prove that more than half a billion people worldwide are classified as overweight and 250 million are classified as obese. The Centers for Disease Control and Prevention (CDC) report that 25% of children ages 2 to 20 are, or risk becoming, overweight or obese. This is twice the rate of obesity seen just a decade ago.

The Food Stamp Program of the U.S. Department of Agriculture (USDA) has allocated funds for a statewide Nutrition Education Plan for Food Stamp participants and their children. The School District of Philadelphia applied for and received funds to conduct nutrition education outreach in all Philadelphia Public Schools via the Food service Division. Target audiences included children, teachers, administration, parents, and foodservice personnel. As a result, 111,044 K to 6 students will receive nutrition education interventions this year. Basic messages of the project include: The Food Guide Pyramid, 5-A-Day, Food Safety and Handling, Nutritional Benefits of School Meals, Diet and Exercise, Cultural Foods, and other topics.

Evaluate tools include both quantitative and qualitative methods. Quantitative measures were designed to maintain accurate records of all nutrition education presentations conducted. Qualitative pre- and post-testing of students, parent surveys, teacher evaluations, etc. are conducted to determine learning gained from nutrition programs. To date, outcomes of the program show that students have gained significant knowledge about eating and are developing a more positive attitude toward nutritious foods.

Training and Staff Development


The goal of this project was to develop a training program that would help reduce turnover and improve the training techniques of foodservice staff members. The objective was training and staff development to build team spirit of all staff members. The foodservice department wants to hire, train, and retain staff, not fire staff members. In order to meet this goal, they must:

1. Review and evaluate the training program that is presently being used by the foodservice department.
2. Develop a survey form to send out to all of the managers in order to enlist their input on a new Training and Staff Development Program.
3. Set up "Train the Managers" classes in order to instruct managers on the proper way to conduct interviews.
4. Set up a time schedule to host a job employment fair.
   a. Advertise on a rented sign located near the foodservice office.
   b. Place an advertisement in local newspaper advertising the job fair.
   c. Set up a time schedule for managers and office staff to do the interviews.
5. Develop a questionnaire to assist managers in the interviewing process.
6. After the interview is completed, decide which people you want to hire.
7. Set a date and time for new staff to report for an in-service training meeting.
8. Establish a two-week training program at a designated school for new staff.
9. Develop a checklist training form that will allow new staff to be instructed on all equipment in the kitchen.
10. Instruct new staff on safety, sanitation, food production, and cooking techniques.

11. Have a manager evaluate new staff performance after the first week.
12. Evaluate new staff performance after the second week.
13. Based on evaluation from the training managers, send the new hire out to another campus for additional training.
14. Evaluate new staff again after the first month of employment to determine if he/she is ready to be assigned to a permanent campus.
15. Set up training classes once a month in the foodservice office for foodservice staff members.
16. Have managers give training classes six times per year at the campus location.
17. Encourage new staff to attend TSFSA classes throughout the year.

The goals of the “Task Force” were to:
- heighten the awareness of food safety issues in the school environment;
- reinforce to employees the importance of their role in food safety;
- put procedures into action that will safeguard “customers”; and
- provide a forum where task force members can learn more about food safety.

The Task Force meets four times a year. Each meeting begins with lunch and time to network. All programs are 1.25 hours long. The focus is to involve one or two staff members from each school district in our counties. These employees then return to their district and help “spread the word” and train other employees.


Recruiting, hiring, training, and retaining personnel present numerous challenges for administrators. The purpose of Aldine’s Child Nutrition Staff Development Program is to address these challenges through a multifaceted, comprehensive training program aimed at all employees. Recruiting efforts are ongoing through menu ads, a Web page, job fairs, and co-op students.

Training begins immediately for “new hires” with our CN Employee Orientation video, developed by our department, which covers basic policies, procedures, and expectations. All new hires hear the same message. New employees in August must attend a full day of training. On-the-job training by managers and mentors is documented. Every school sends an employee to monthly area meetings on topics including weights/measures, customer service, and components. Monthly professional growth and movie time sessions take place after school and are open to all. Speakers and/or videos cover areas from baking to garnishing to people skills. Those wishing to advance to management must be accepted and complete a Management Training Program.

The Department houses an extensive Professional Growth Library available to CN staff and teachers. Managers must complete a minimum number of self-training modules and staff-training lessons yearly. Managers may exceed requirements and apply for monetary incentive called Exemplary Manager. Certification incentives are paid to all employees who meet level requirements. CN sponsors certification classes and encourages participation in local, state, and national foodservice associations. Our philosophy is to develop and involve our staff in the CN program from the beginning with our goal being to “grow” and retain a qualified and content staff.


The purpose of this project was to provide training for school foodservice personnel to improve or enhance their programs through sharing of “Best Practices.” School foodservice personnel were the target audience.

Project PA, a collaboration of the Pennsylvania Department of Education (PDE), Division of Food and Nutrition, and Penn State University, was initiated in 1995 in response to the School Meals Initiative (SMI) for Healthy Children. Through the current project, the Project PA team undertook a two-pronged approach to the documentation and dissemination of “Best Practices” in school foodservice. Two new foodservice directors were selected to be involved in the project.

Over the course of one-and-a-half years, the Project PA team worked with these foodservice directors and video-documented their efforts to comply with the SMI guidelines. Successful, creative practices of other foodservice directors from throughout the state also were identified and video documented. The resulting video documentary was shared during a one-day statewide teleconference reaching 491 school foodservice employees at 24 downlink sites.

During the teleconference, participants were asked to fax descriptions of their own “Best Practices” to the main broadcast site. Following the teleconference, the video footage was edited into a 50-minute training tape. The “Best Practices” featured in the video, as well as many that were submitted during the teleconference, were compiled into a “Best Practices in Pennsylvania School Foodservice” manual. Practices in the areas of training, community involvement, improved breakfast participation, increasing nutrition awareness, and innovative foodservice practices are included. The edited teleconference video and “Best Practices” manual were distributed to all National School Lunch Program sponsors in Pennsylvania. This project was funded through a 1998 USDA Team Nutrition grant administered through the Pennsylvania Department of Education.

The “Best Practices” manual that resulted from this project features practices that can be replicated by other school foodservice employees to improve or enhance their programs. The manual is accessible at the following URL: http://nutrition.hde.gov/ projectpa/html/BP_Manual_link.html.


On February 18, 2001, a Superior Court jury in Benton County, Wash., awarded $4.75 million to 11 children and their families in a case involving an E. coli O157:H7 foodborne illness outbreak that originated at Finley Elementary School. This case had two unique features: 1) It was the first E. coli case in the United States to go to verdict and award money to a plaintiff, and 2) The jury placed full and complete responsibility on those who prepared and served the food (ground beef) and none on the company that supplied it.

The purpose of this presentation is to describe a key factor that contributed to this outbreak and to explore the implications for administration of a safe child nutrition program. While this case drew attention to the importance of HACCP, an underlying theme was the critical nature of administrative leadership. In this case, foodservice employees were not encouraged to participate in continuing education nor were they guided through change. As a result, procedures for storing, preparing, and serving foods were seldom updated and work habits repeated the past with little opportunity for change.

Foodservice employees need a supportive environment where they are supplied with both the training and resources necessary to consistently prepare safe foods. Snyder (1990) stressed that management by example is one of the most effective ways to promote food safety at the employee level. Administration sends a message that safety is important when training is supported and those activities that prevent foodborne illness are valued. Hess (1997) noted that educating those who provide food to children is a high priority for all child nutrition programs. Martin (1987)
described employee training in food protection as one of a school's most important responsibilities. The outcome of this case underlines the importance of continuous employee training and this can only be accomplished with the full and vigorous sponsorship of administration.

Training through Distance Learning.
Rodgers, K., Bock, A., Golasco, M.B., & Uy, A., Region 19, Education Service Center, El Paso, Texas.

The purpose of this project was to develop alternative training opportunities for child nutrition personnel using the technology available in most school districts. The target market was child nutrition personnel in both urban and rural settings. The plan of the project was to develop training materials developed by experts in specific areas of child nutrition and be made available to all districts regardless of location or enrollment. The materials should be flexible enough to be used in many different formats. A committee consisting of a professor of nutrition, regional child nutrition specialists, regional technology director, director of training—Texas Education Agency and local foodservice directors was formed. The members identified areas where training was needed. A timeline was developed for production and distribution.

The following training materials were identified that needed to be developed: Interactive CD, Online Courses, and PowerPoint presentations. The first phase of the project was to develop the training CD. Menu planning was identified as the target area of training. It was determined that the CD should be available in both English and Spanish, due to our proximity to the bordering states. The first CD to be developed was “Maximizing Menu Management Skills” (MMS). This CD includes modules on nutrition, menu planning, and recipe standardization. It details all menu-planning options. The English version was completed in Spring 2001 and is available for distribution. The Spanish version is planned for fall distribution.

The second phase of the project, started this Spring, is a CD on cycle menus using all menu options, production records, nutrient analysis, and marketing ideas. It is due for distribution in Summer 2002.

The advantage of this type of training is that each module may be used independently or together. The training may be adapted to be presented in sessions of two, four, or six hours, or may be presented as one-on-one training with supervisors in a kitchen. It also can be taught as a self-study course at home or in the school computer lab. All materials needed for the course are included on the CD and can be printed as needed. A “train the trainer” workshop is scheduled for facilitators in March to demonstrate the many uses of the CD.

Distance learning truly is the new training frontier of the 21st century. It will never replace teachers, but it can make the experts in the field more accessible to everyone. The possibilities are endless. Imagine taking a course taught by a leading professor some 5,000 miles away in a remote community in Texas, and some of your classmates are in Australia or India. This exchange of experiences is invaluable.

Camp WeGottaFeed’Em. Chellberg, S., & Ford, S., Blue Valley School District, Prairie Village, Kansas.

Blue Valley School District in Overland Park, Kan., hosted “Camp WeGottaFeed’Em” in August 2000. It was the Food & Nutrition Services All-Staff’s annual kickoff in-service event, but the first year it was themed training day. The camp theme was developed based on the department’s yearlong theme surrounding a poem about a little red wagon, which emphasized teamwork. The stage was set with a campfire scene, including a tent, mock campfire, and woodland critters toasting their marshmallows. Office staff dressed in their tan shorts, hiking boots, and straw hats. A few managers even wore Boy Scout uniforms! Approximately 150 employees from 28 sites gathered to review regulations, learn new tips, and share ideas.

The day began with a Welcome and “Camp Orientation” and the “campsites” were explained. A team of four managers took responsibility for planning and implementing each campsites, with a total of eight from which to choose: Proper Lifting, Reimbursable Meals, Sanitation Reminders, Incentive Explanation, National School Lunch Week—Make It & Take It, Time Savers & Tips, Menu Basics, & Blood Borne Pathogens (required yearly for all employees). Employees rotated through six campsites of their choice, with only 10 people at each site at a time. This arrangement gave our managers a sense of ownership to their topic, employees a chance to interact and ask questions, plus was a fun way to disperse a large amount of information.

Employees earned a “Badge” for every campsite they attended. We then did a “Cabin Roll Call” and introduced each manager and their staff for every school. Each school received a little red wagon, which would be restocked by the office staff with goodies pertaining to that month’s emphasis of the little red wagon poem. The morning ended with lunch in the “Mess Hall.” Employees got to redeem their badge ribbons for a little red wagon pin.

We found that changing the day from a breakout session and lecture format to an interactive system where the employees could get involved was a lot more productive. Employees were open to learning from other managers and not as intimidated by the presentation or surroundings. Local press was invited and did a positive story not only about our day, but also our school lunch program. Other child nutrition programs would benefit from developing a yearly theme, so that all activities, inservices, and department events throughout the year can be united together through the chosen theme.


Typically, lunchtime for school-age children is part of a recess from learning. At a time when significant numbers of children are suffering from what the Centers for Disease Control and Prevention (CDC) has called “an epidemic of obesity.” This might have to change. Foodservice personnel have the opportunity to be ambassadors of good nutrition and food system educators. At the same time, the steady decline in the number of small and medium-size farms due to high production costs, low prices for their products, and poor access to markets needs to be addressed. The U.S. Department of Agriculture’s Small Farms/School Meals initiative seeks to connect farmers with school cafeterias in an effort to increase farm viability and provide healthier food for school lunch. Regional farm-to-school projects are therefore an innovative way to improve children’s health while giving small and medium sized farms access to a part of the $16 billion school foodservices market.

Two surveys were developed for school food authorities (SFAs) in Connecticut. The Milk Survey assessed the type of milk consumed by students. The Breakfast Survey sought comprehensive information about breakfast programs, in addition to receiving detailed background data about the SFAs.

Two hundred twenty-four of both surveys were mailed to SFAs, including public, private, and residential child-care institutions (RCCIs). A 55% return rate (n=124) was realized on the milk survey and a 42% return rate (n=94) on the breakfast survey. Seventy-four percent (n=70) of the respondents served breakfast. The number of SFAs that completed the Breakfast Survey represents 62% of the SFAs currently offering breakfast.

Of the respondents that offer breakfast, 74% offer it at elementary schools, 46% at middle schools, 65% at high schools, and 100% at RCCIs. Less than 50% of the elementary and middle schools and 8% of the high schools offer only cold breakfasts. Data were collected for approximately 20 breakfast items in terms of popularity and the SFAs' ability to serve the item. The milk survey data were used to determine a “state milk,” which reflected actual milk consumption by students, weighted according to SFA population.

After analyzing data, 10 weeks of breakfast menus were developed that meet the Healthy School Meals Initiative and are an Assisted NUmenus. In an effort to meet the needs of schools equipped to serve cold items only, a four-week cold breakfast menu was developed. A four-week lunch menu had been previously developed that met these standards. The lunch menu was expanded to 10 weeks. The menus are being tested for cost, acceptability, and feasibility.

Upon project completion, final menus will be available to all Connecticut SFAs. The project was funded in part by the Connecticut State Department of Education, Child Nutrition Programs, with funding from the U.S. Department of Agriculture’s Team Nutrition Training Grant.

School Foodservice and Catering: A Profitable Combination? Robinett, J., Beaver Creek City Schools, Beaver Creek, Ohio.

The researcher is the foodservice director for Beaver Creek (Ohio) City Schools. Faced with budget problems, she undertook this project in hopes of finding that catering meals and meetings—aside from school lunch—would provide the foodservice department with additional revenue. Several events were catered by the department. The results were mixed—some were profitable and some lost money.

Additionally, 114 surveys were mailed to other school foodservice directors in Ohio and the results of the 55 surveys that were returned are contained in this document. The conclusion of the study is that while some money can be made in catering by school foodservice departments, it is rarely a significant amount. It did not appear to be enough to solve the problem. The recommendation is that other means of funding the budget deficit must be found, but catering events will bring in additional profit if well managed.

Nutrient Consumption of Elementary Students Participating in the School Breakfast Program in a Rural District of Kansas. An, M.Y., Shanklin, C.W., & Johnson, K.E., Kansas State University, Manhattan.

The purposes of this study were to investigate the nutrient consumption of elementary students in a rural school who participated in the School Breakfast Program (SBP), and to ascertain nutrient density and contribution per penny of each breakfast component. The data were collected three times for six selected breakfast menus. The weighed plate waste method was used to determine nutrient intake. The nutrient content of planned menus and selected and consumed meals were analyzed for energy, total fat, saturated fat, protein, calcium, iron, vitamin A, vitamin C, cholesterol, sodium, fiber, and carbohydrates (CHO) using the nutrient database from NutriKids™. The nutrient density and contribution per penny of the four meal components (milk, juice, cereal, and entree) were compared.

Except for energy, fiber, and sodium, the nutrient intakes of students met the U.S. Department of Agriculture (USDA) requirements for school breakfast and Dietary Guidelines for Americans goals. The nutrient content of the meals selected was higher than the planned menus for total fat, protein, calcium, vitamin A, and sodium. The nutrient content of meals as selected was significantly higher than the nutrient content of the meals consumed for energy, calcium, vitamin A, and CHO (p<0.05). The entree contributed significantly more energy, total fat, protein, and sodium than other meal components.
Abstracts

Food Recovery/Donation Practices in School Foodservice Programs. Lee, K.E., & Shanklin, C.W., Kansas State University, Manhattan.

The purposes of the study were to investigate current practices in food recovery/donation and to identify resources needed for initiating or improving recovery programs in school foodservice. The population for the study was the school foodservice programs that participated in the National School Lunch Program, in Mountain-Plains Region of the U.S. Department of Agriculture’s (USDA) Child Nutrition Program (CNP). A random sample of 1,091 programs was selected using lists obtained from state directors of CNPs. A questionnaire was developed and pilot-tested for content and construct validity by 10 CNP directors. Study variables included participation in food recovery, food recovery practices, factors related to implementation of food recovery, and information about the CNPs.

The principles of the Dillman’s Tailored Design Method were used in the survey administration. The results of the pilot study revealed that larger districts were more likely to participate in food recovery programs. The districts donated food to more than one organization. The directors whose programs did not participate in food recovery indicated “not enough food to donate” and “lack of knowledge about available options,” and “cost” and “lack of information about related regulations” as major operational and administrative barriers, respectively. The first round of questionnaire mailing, preceded by pre-notification, achieved a response rate of 42%. Understanding practices of foodservice programs that have participated in the food donation programs, factors discouraging participation, and perceptions of foodservice directors about food recovery will provide directors who are interested in food recovery with valuable information. Recovering edible food from school foodservice will assist community agencies in feeding the hungry and improve the public image of CNPs.


One purpose of this study was to examine the current status of brand-name, fastfood service in the Indiana school lunch programs. Two consecutive surveys were conducted. The first survey (n=446 school food authorities—SFAs—in Indiana, 88% response rate) identified 115 SFAs serving or planning to serve brand-name fastfoods in their lunch programs during fall 1999 and the second survey (n=115 SFAs, response rate=67%) asked detailed information regarding branch-name fastfoodservice in each school under the authorities. The analysis of data regarding brand-name fastfoodservice by 136 schools (48 elementary, 26 middle, 52 high, 4 primary, and 6 secondary schools) showed the following. Pizzas (82%) were the most often available brand-name fastfood, followed by sandwiches (35%) and burritos (14%). The number of brand-name fastfood items offered by the schools ranged from one to four with a mean value of 1.26. Most of the schools (77%) offered brand-name fastfoods one week or less. However, there were schools offering brand-name fastfood everyday (18%).

The kind and frequency of brand-name fastfoods offered by the schools increased as school grade levels increased. About two-thirds of the schools offered brand-name fastfoods as part of reimbursable school lunches. Elementary schools were more likely to serve brand-name fastfood as part of reimbursable meals than a-la-carte whereas higher grade-level schools were more likely to offer them a-la-carte than as part of reimbursable meals.

The findings in this study were used when designing a study on the nutritional impacts of brand-name fastfoodservice in the Indiana school lunch programs.

The Most Cost-Effective Disposal Methods in the Central Food Processing Center at a School District in the Midwest. Wie, S., & Shanklin, C.W., Kansas State University, Manhattan.

The purpose of this study was to determine costs of alternative disposal methods for waste generated in the Central Food Processing Center (CFPC) at a school district in Midwest. Disposal methods used in CFPC at the time of the study were landfill, off-site composting (pilot-tested), and food recovery for food waste. Cardboard boxes were recycled and other packaging wastes were transported to the landfill. Off-site composting and garbage disposal were selected as a feasible and applicable disposal method to be analyzed. Retrospective data collected during a waste characterization study, stopwatch studies, interviews, and data from manufacturer’s specification were used to determine cost incurred.

The costs for each alternative were evaluated for the 10 ensuing years. Off-site composting and food recovery for food wastes and recycling cardboard boxes and transporting other packaging wastes to landfill was the most cost-effective alternative ($879,633). The disposal methods in use at the time of the study were the most expensive alternative ($882,417). If an effort was made to separate all food wastes that possibly could be composted before putting trash into dumpster for transport to landfill, the district could save approximately $57,000 in waste disposal costs for the next 10-year period.

Update of Knowledge and Skill Statements for Effective School Nutrition Directors/Supervisors Through Modified Delphi Technique. Rainville, A.E., National Foodservice Management Institute and Eastern Michigan University, Ypsilanti.

The purpose of this research was to update the 1995 Knowledge and Skill Statements for Effective School Nutrition Directors/Supervisors. These statements are the foundation for educational programming for the National Foodservice Management Institute (NFSMI). Expert panelists from 18 states (n=21) were school foodservice directors, state agency personnel, educators, and NFSMI staff. They participated in an analysis that used a modified electronic Delphi technique.

The original document was sent as an electronic mail attachment and panelists...
were asked to critique the knowledge and skill statements; the comments of all panelists were incorporated before editing. The edited version was sent to panelists and they again provided comments and suggestions on the changes. The original document focused on 16 functional areas and included 46 competencies and 501 knowledge and skill statements. The revised document contained 14 functional areas with 41 competencies and 613 knowledge and skill statements. The functional areas with the most changes were Sanitation and Safety, General Management, and Marketing. The revised document will be used to update NFSMI courses and training materials.

**Impact of Brand-Name Fastfoods on School Lunch Participation at Indiana Schools.** Yoon, B.J.H., Almanza, B.A., & Hilemstra, S.J., Purdue University, West Lafayette, Indiana.

One purpose of this study was to assess the impact of brand-name fastfoodservice on school lunch participation at Indiana schools. Daily school lunch participation records were obtained along with menus from 42 Indiana schools having used brand-name fastfoods in their lunch services at least once a month during September, October, and December 1999.

Average daily participation in school lunches as percentages of school enrollment (called ADP rates) was compared between the days when brand-name fastfoods were served and when they were not served. In the schools (n=10) serving brand-name fastfoods solely as part of reimbursable school lunches, the ADP rate was significantly higher when brand-name fastfoods were served than when they were not served (paired t=5.699; p<0.001). In the schools (n=16) offering brand-name fastfoods solely a-la-carte, the ADP rate was significantly lower when brand-name fast foods were offered than when they were not offered (paired t=4.647; p=0.001).

In the schools (n=16) where brand-name fastfoods were available both as part of reimbursable school lunches and a-la-carte, the ADP rates did not significantly differ between the days when brand-name fastfoods were offered and the days when they were not offered (paired t=0.327; p=0.748). It was concluded that the impact of brand-name fastfoods on school lunch participation differed depending on the types of service where brand-name fastfoods were available.

**Schools using brand-name fastfoods in their lunch services should offer them available as part of reimbursable school lunches. Offering brand-name fastfoods solely a-la-carte items will induce students, who could choose nutritious school lunches otherwise, to purchase a-la-carte foods.**


Nutrition is important to children at all ages; however, it is extremely important for children in middle grades who are experiencing great changes in their physical and psychological development. They are growing rapidly and are particularly vulnerable to outside pressures during these years. For these reasons, it is critical to provide a good nutrition environment for these children. As a result, a focus group research project was developed to determine the status of the nutrition environment for middle grades nationwide.

The focus group sessions were conducted at three sites throughout the United States: Kansas City, Mo; Las Vegas, Nevada; and Reston, Va. School administrators (principals and superintendents) from a nine state radius of each location were invited to participate. Participants were involved in two focus group sessions. The questions used in the morning sessions led to the identification of barriers to having a good nutrition environment in the middle grades. The afternoon sessions addressed strategies for improving the school nutrition environment. The constant comparative method of analysis was used to organize research findings (Glaser & Strauss, 1967). Results showed that school administrators did not think the environments in middle grades were conducive to healthy eating habits. Vending machines and a la carte sales of unhealthy food items received much discussion. The major barriers to having a good nutrition environment in middle grades identified by school administrators were: funding; attitudes of students and parents; outside influences; peer pressure; lack of vision; lack of knowledge; inequality among free, reduced, and paying students; food preparation, quality, and taste; menu and menu choices, and lack of commitment by school administrators. When asked for suggestions to overcome these barriers, the major response was funding. If adequate funding were provided, many of the issues could be solved. The other solutions involved the theme of commitment. One administrator stated, "When it becomes a priority, it will get done." Local school districts, communities, parents, educators, and school administrators must work together to eliminate these barriers.


The purpose of this study was to determine the characteristics of child care center directors who participate in the Child and Adult Care Food Program (CACFP), and identify their perceived training needs. A four-page survey was sent to 1,505 child care directors based on a national proportional, stratified, random sampling technique to assure equal representation among U.S. Department of Agriculture (USDA) regions. Of the 54% returned, 691 were usable surveys.

Child care center directors were asked to respond to questions relating to demographic characteristics, profiling the director and facility, in addition to the most desired method of training delivery and frequency of training. The top five training needs for child care directors focused on program requirements and administrative record keeping. The directors rated the top five training needs for the center staff as food safety, meal pattern, and mealtime management issues. The study results will assist NFSMI, USDA, state agencies, and training consultants in developing and presenting training materials that meet the needs of child care directors and staff members involved in the CACFP.


This study evaluated Texas school foodservice financial and programmatic data describing operational outcomes and the extent that small, rural districts subsidize their foodservice budgets. The 1998-99 school foodservice financial data from western Texas school...
districts with enrollments under 1,500 were analyzed. All districts with enrollments of 1,500 or less (n=170) in the Texas Education Service Center Regions 16, 17, 18, and 19 were asked by mail for a copy of their revenue and expenditure report for the school lunch fund. A report detailing child nutrition program statistics for each of the school districts during the same time period also was requested from the Child Nutrition Programs Division of the Texas Education Agency. This report provides annual NSLP and SBP participation statistics and the number of students approved for free and reduced-priced meals.

Descriptive data were compiled on meal participation, program revenues and expenditures, operating ratios, district size, and percentage of at-risk population. These variables served as independent variables for modeling procedures. The dependent variable meal program profit or loss was calculated (Sum of program annual revenue - Sum of program annual expenditures.) Descriptive statistics and preliminary multiple regression modeling procedures predicting school meal program financial outcomes was tested using SPSS 10.0. Sixty-one school districts (35.8%) responded to the initial information request. Results indicated that the total loss of the surveyed districts was $2,678,800. Fifty-nine (96.7%) districts submitting financial data experienced a program loss.

Using regression procedures, the type of revenue (state or local), the district's enrollment, and the percentage of the district's enrollment that is considered at-risk were not found to be indicators of financial self-sufficiency. It did appear from the results of these three sets of data that as their values increased, the meal program deficits decreased. The amount of local revenue (meals sold to students paying full price for meals, a la carte sales, and meals sold to adults) and the meal program's food cost (calculated as a percent of total revenues) also were not found to be indicators of financial self-sufficiency. However, it appeared that as local revenues and food cost (calculated as percentages of total revenue) increased, the deficit increased. Labor cost calculated as a percent of total revenues did seem to be an indicator of financial self-sufficiency. As labor cost percentages increased, a school district's meal-program deficit increased. Labor cost percentages ranged from 35% of revenues (from a district that showed a surplus of funds) to 126% of revenues (from the district that showed the largest deficit). With 59 of 61 districts from western Texas Education Service Center Regions showing more than a $2,000,000 combined loss, there appears to be opportunities to establish operational efficiencies in these school meal programs. The factor that seems to be contributing to the greatest part of the deficit problem appears to be labor cost and its control.

For districts seeking to eliminate or reduce their meal program deficit, there is a need for resources that help them accomplish this task. Presently, there appears to be very little help available for small districts wishing to operate their foodservice programs more efficiently and effectively. Regional cooperative food purchasing programs have surfaced to help lower food costs, but food cost does not seem to be a major indicator of financial self-sufficiency. Resources for superintendents and business managers to assist in the control of labor costs seem to be needed as much as food purchasing cooperatives.


The impact of serving scratch or convenience menu items on labor productivity and customer satisfaction was initially investigated at a rural Residential Child Care Institution (RCCI) foodservice program in Texas. Three primary relationships were measured: 1) preparation levels and customer satisfaction; 2) warming holding times and customer satisfaction; and 3) total food and labor cost per serving and preparation classification levels. Data were collected during production of the lunch meals on four days of a two-week period. An equal distribution of 10 scratch and pre-made entrees and side dishes were evaluated. Menu items were classified using a six-level scale ranging from all ingredients scratch (i.e. required assembly, preparation, cooking, and heating) to all ingredients pre-made (i.e. no assembly, preparation, cooking, or heating required). Labor and food costs were calculated using recipes, invoices, payroll records, and observation data. Each day 40 6th-, 7th-, and 8th-grade students evaluated menu items for flavor, aroma, texture, appearance, and temperature using a five-point Likert scale.

Menu item production times ranged from 15 minutes to 117 minutes, while warmer holding times ranged from 25 minutes to 93 minutes. Total food and labor cost per serving of entrees ranged from $0.36 to $1.41, while sides ranged from $0.06 to $0.36. Level of scratch preparation was inversely related to appearance (p<0.000) and flavor (p=0.002). Additional inverse relationships were found between increases in warmer holding time and food appearance (p<0.000) and flavor (p=0.002). The relationship between total labor and food cost per serving and preparation classification level also was significant (p=0.000). All preparation levels were significantly different in cost with all scratch the most expensive. Findings demonstrated that satisfaction levels increased with pre-made foods, while pre-made foods cost less to produce. However, warmer holding times were extended with pre-made foods. Future studies should focus on comparison of like items and include evaluation of nutrient content.


The objective of this presentation is to describe cycle menus that were converted to soy-enhanced menus served within a Head Start Program. Obesity now affects at least 20% of children in the United States. The trend toward obesity starts during the preschool period, and obesity is a risk factor for cardiovascular disease (CVD). Incorporating soy foods may be a way to help lower calories and fat in the preschool menus while providing heart-healthy menus. The health claim for soy indicates soy protein can lower the risk of CVD, and we have found that including soy in foods increases protein while lowering fat content of menus. Soy foods have been used in school foodservice, but no reports are available of the use of soy within the Child and Adult Care Food Program (CACFP). Cycle menus developed for Head Start centers were modified to include at least 5 to 6 g of soy protein for each main meal. No attempt was made to change the items served and most items on the menu were available to the centers through institutional distributors. Menus and recipes will be available with nutrient calculations showing higher protein and lower fat, demonstrating the implementation of soy-enhanced menus within the CACFP program.
Nutrient Content of Lunches In Russian Elementary Schools. Le Taras, Parkland Memorial Hospital, Dallas, TX; Bednar, C.M. & Mathur, S., Texas Woman's University, Denton; Connors, P.L., University of North Texas, Denton.

Lunches served to school-aged children in other countries may vary from those served to children in the United States. The purpose of this study was to determine nutrient content of elementary school lunches in Russia and compare to both Russian and American nutrient standards. A member of the research team traveled to Russia and interviewed school lunch managers at 10 selected elementary schools in Moscow and North Caucasus. All schools had an enrollment of 800 students or greater.

Information obtained during each interview included one week's school menus plus details on recipes and ingredients, food products, portion sizes, and food preparation methods. Menus were analyzed for nutrient composition using the Nutritionist V computer program. Russian school lunches provided a weekly of 696 kcalories, 32.3% from fat (including 13.6% from saturated average fat), 16.5% from protein, and 52.5% from carbohydrate. Less than half of the schools met U.S. dietary guidelines for total fat and saturated fat. Lunch menus contained adequate amounts of protein, iron, vitamin A, and vitamin C, but averaged only 114 mg of calcium, which was less than half of the U.S. requirement and less than one-third the Russian requirement. Milk, an excellent source of calcium, was not served in these Russian schools. Lunches could be improved nutritionally by including milk as a beverage, reducing use of sour cream, butter, and salt in cooking, and adding whole grain products, legumes, and fruit.
COMPLETED RESEARCH ACTIVITIES

FUNDamentals Pilot Study. The pilot study for the NFSMI financial management information system software, FUNDamentals, was completed in June 2001. Selected users met this spring in Idaho to discuss program outcomes and suggestions for improvement. FUNDamentals will be available from NFSMI in early Fall 2001.

Afterschool Snack Study. NFSMI scientists conducted focus group research in Phoenix, St. Louis, and Philadelphia to determine operational issues associated with implementing an after-school snack service as part of the National School Lunch Program. Thirty school foodservice directors (FSDs) from 15 states participated. The FSDs worked in large and small districts offering the after-school snack service.

Participants stated that after-school snack service played a key role in meeting children’s daily nutrient needs and provided an opportunity for the school nutrition program to serve the community. School FSDs faced a variety of challenges, including: providing snack menu variety; training after-school care program providers; preventing facilities abuse by program participants; scheduling time required to prepare and submit claims; and monitoring after-school snack service to ensure accountability.

Most FSDs wanted more flexibility in regulations. The researchers concluded that the after-school snack service can be a challenge to operate, but the issues are not insurmountable. The FSDs’ efforts to develop this type of service for children are more than compensated by community goodwill.

Lower Elementary School Foodservice Survey for Parents. Applied Research scientists developed the final survey instrument to complete the set of student satisfaction surveys available through the NSFMI for grades K to 12. The Lower Elementary School Foodservice Survey for Parents was developed to determine parents’ satisfaction with school nutrition programs (SNPs) for their children in grades K to 2. Previous research had pointed to parents as prime customers when their children were at this grade level.

Findings from the focus group sessions indicate that school foodservice managers and directors define a long-term employee as one who has worked five or more years. “Ideal” employees were described as honest, dependable, child-centered, willing to learn and accept change, able to get along with others, and team players. Other necessary attributes expressed were physical ability to do the work, a sense of humor, and command of basic reading and elementary math skills.

RESEARCH IN PROGRESS

Characteristics of Long-Term, Successful School Nutrition Employees. Phase Two of this research project will use the results from the focus group sessions to develop a mail survey that will be sent to a national random sample of school foodservice managers and directors throughout the United States. The purpose of this phase of the project will be to identify an industry consensus on characteristics of “ideal” school foodservice employees. The third phase of the project will be to develop school foodservice and nutrition program screening tools for use in the employment process.

Competencies and Perceived Training Needs of CACFP Sponsor Monitors. CACFP sponsors hire monitors to train and monitor family child care providers who serve food to children through the CACFP. They are gatekeepers for program quality in family child care settings. NFSMI researchers surveyed all CACFP sponsoring organization directors and at least one monitor from each sponsoring organization throughout the United States (N = 2,090) to determine the scope and importance of the monitor’s job duties. The survey also asked directors and monitors to indicate the training needs of monitors with regards to the CACFP.

Researchers currently are analyzing data on the importance and frequency of job duties. The final stage of this project will be to develop knowledge and skill statements related to performance of the sponsor monitor’s job. These statements will then be used by NFSMI to develop a monitor’s position description and training materials.
Teacher and School Administrator's School Foodservice Survey. Research is underway to develop a survey instrument to measure the opinions of teachers and school administrators about school nutrition programs. Pilot testing of this instrument will occur in Fall 2001.

School Nutrition Environment Survey. Researchers will survey school stakeholders to confirm and validate the findings from the focus group research on the barriers to and strategies for enhancing the school nutrition environment in grades K to 12. School business officials, school administrators, teachers, coaches, and school foodservice administrators working in K to 12 schools throughout the United States will comprise the random sample for this survey.

NEW PUBLICATIONS AVAILABLE
Financial Management Information System: Preliminary Report. This technical report details the NFSMI Financial Management Information System (FMIS) developed through consensus of a national task force. FUNDamentals, the FMIS software automates the analysis and reports described in this publication. R-43-01.

School Nutrition Environment in the Middle Grades and the Promotion of Healthy Eating Behaviors. This technical report describes the focus group research conducted in Summer 2000 on the school nutrition environment. R-44-01.

Eating at School: A Summary of NFSMI Research on Time Required by Students to Eat Lunch. This technical report summarizes findings from three NFSMI-sponsored time studies on student eating in K to 12. R-46-01.


These and other products or publications are available on the NFSMI Website, www.nfsmi.org, or by contacting the NFSMI Sales Department at P.O. Drawer 188, University, MS 38677-0188, (800) 321-3054. For additional information about NFSMI research activities, contact the NFSMI Applied Research Division staff at (601) 266-5773.
Guide to Authors & Submission Requirements

The Journal of Child Nutrition & Management contains research articles focusing on many aspects of school-based foodservice programs and operations, including food quality and production, operations management, program evaluation, nutrition standards, and nutrition education. With the exception of works developed as a result of projects funded by the U.S. government, manuscripts must be original, unpublished, and not submitted for publication elsewhere. Membership in the American School Food Service Association (ASFSA) is not a prerequisite for submitting manuscripts.

**PRIMARY AUDIENCE**

The primary audience of The Journal of Child Nutrition & Management is school foodservice/child nutrition professionals at the district and state levels. Other readers include those involved in nutrition public policy, students, school administrators, college and university faculty, researchers, and industry R&D and marketing staff.

**ARTICLE CATEGORIES**

The Journal of Child Nutrition & Management accepts manuscripts in the following four categories: Commentary, Current Issues, Research in Action, and Practical Solutions. Each manuscript will be evaluated through a blind peer review process, considering many factors, including, but not limited to: content, originality, article readability, active style of writing, results and discussion, conclusions, quality and use of tables and figures, applications for school foodservice operators, proper term definition, referencing of statements of fact, and methodology. Manuscripts will be rejected if they are deemed inappropriate for The Journal of Child Nutrition & Management, or if they do not conform to the following category guidelines.

1. **COMMENTARY**: Should be a brief opinion piece on a timely subject that stimulates thought, challenges the status quo, and provides suggestions for action or areas for research. Charts/tables/figures/illustrations should not be submitted in this category. **Article Length: up to 1,500 words, including References.**

2. **CURRENT ISSUES**: May be a review of literature or a discussion of a subject of current interest or controversy. The article may include references and charts/tables, but should not discuss data collection or methodology in detail. Papers should include an Abstract (see below, under “Research in Action”). No more than three charts/tables/figures/illustrations should be submitted in this category. **Article Length: up to 2,500 words, including Abstract and References.**

3. **RESEARCH IN ACTION**: Papers should report original research and include all of the following sections clearly labeled and in the order listed below. No more than four charts/tables/figures/illustrations should be submitted in this category. **Article Length: up to 4,500 words, including Abstract and References.**

   - **Abstract**: Briefly state the purpose of the research and provide an overview of the methodology, major findings, and application to practice. Percentage of article: 10%—not to exceed 450 words.
   - **Introduction**: State the purpose of the study and provide a brief discussion of relevant literature. Percentage of article: 15%—not to exceed 675 words.
   - **Methodology**: Briefly describe the research sample, the research instruments used, and how data were collected and analyzed. Submit (for review only) any questionnaires or other test instruments used in the research to allow reviewers to assure the validity of the methods used. Percentage of article: 15%—not to exceed 675 words.
   - **Results and Discussion**: Present findings of the research, discuss their significance, and, if possible, relate the new information to previous knowledge of the topic area. Percentage of article: 30%—not to exceed 1,350 words (not including charts, tables, and illustrations).

4. **PRACTICAL SOLUTIONS**: Papers should describe a problem or challenge faced by a school foodservice operation, and discuss how a partnership between the operation and the academic community solved the problem and led to enhanced operational effectiveness and efficiency. The paper also may offer suggestions for future research on the topic. Papers should include an Abstract (see above, under “Research in Action”). No more than three charts/tables/figures/illustrations should be submitted in this category. **Article Length: up to 2,500 words, including Abstract and References.**

**STYLE OF ARTICLES**

In addition to meeting the criteria of the above article categories, all manuscripts should be written in a direct, active voice and an easy-to-understand manner that makes both the research and results understandable to the practitioner. Avoid heavily academic, technical language, and explain technical terms. Before submitting a paper for publishing consideration, authors in the academic community may wish to have a practitioner in their local area review the paper for clarity and practical application.

**MANUSCRIPT PREPARATION**

Submit four copies of the manuscript for the peer review process; type manuscripts double-spaced on 8½ x 11-inch paper with 1-inch margins on all edges. Number each page.
clearly. As an aid to reviewers, please number each line of manuscript copy down the left margin, beginning each page with line 1. Assemble your material for submission in the order described below:

**Title Page:** The title page should be the first page of the manuscript and should include the title of the article; article category the manuscript is being submitted in; word count for the total manuscript, as well as each individual section; the name, professional suffixes, job title, place of employment, and addresses of all authors; and the phone number and mailing address of the person who should receive the galley proof (corresponding author). Identify authors on the title page only, so the manuscript can be reviewed confidentially.

**Abstract:** On a separate sheet of paper, include the title of the article as well as a summary of the paper (see Abstract under “Research in Action” above).

**Text:** Write in active voice and according to requirements of the appropriate article category described above.

**Acknowledgements:** These may include acknowledgement of technical assistance, sources of financial support, or identification of a thesis, dissertation, presentation, or preliminary report from which data were taken.

**Tables:** Type each table double-spaced on a separate sheet and number sequentially and identify each with a short title. Preferably, tables should be formatted in a recognized software program (e.g., Microsoft Excel or Word). Limit tables to those essential for clarification. (See article categories for maximum number to submit.)

**References:** Use only references cited in the text. Type double-spaced on a separate sheet and in alphabetical order. Follow the American Psychological Association (APA) style for references.

**Illustrations, Figures, and Charts:** These should be professionally drawn or prepared on a computer. Submit one camera-ready copy (e.g., on a high-contrast, glossy, black-and-white print copy), as well as a high-quality photocopy with each copy of the manuscript. These should be no larger than 8½x11 inches. Include the author’s name and address, and any illustration credit information on a label affixed to the back of all copies of the illustration. Limit illustrations to those essential for clarifying the text.

**The Review Process**
Authors will receive written acknowledgement of the initial receipt of their manuscript. All submitted manuscripts are then sent to peer reviewers who are experts in their fields. After peer review (usually 10 to 12 weeks after the date of the initial acknowledgement letter), the editor will notify the corresponding author whether the manuscript has been accepted as is, with revision, or rejected. In the case of required revisions, the reviewers’ evaluation will be returned. Upon acceptance, submit two print copies, with all line and page numbering removed, and a file on a 3½-inch diskette in a recognized word processing program (e.g., Microsoft Word, WordPerfect). Indicate table and figure locations in manuscript following APA guidelines.

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**Final Checklist**
Before submitting a manuscript for review, please consult the following checklist of requirements to ensure the paper meets The Journal’s standards for publication. The Editor can and will reject manuscripts that do not meet the specified criteria.

- Have you submitted four copies of the manuscript prepared according to the guidelines?
- Have you attached a complete Title Page?
- Have you included an Abstract page, with the title and summary only?
- Have you provided author biographical information?
- Have you included Acknowledgements (if applicable)?
- Have you included and properly formatted References?
- Have you met the guidelines regarding tables/charts/figures/illustrations?
- Have you indicated an article category?
- Is the text written in an active voice, and can it be easily understood by practitioners?
- Have you numbered the lines of the manuscript?
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