School Food Service Research Review is a refereed journal designed to disseminate research findings and other relevant information applicable to school food service in the areas of food service facilities, food quality and production, management, program evaluation, nutrition standards, and nutrition education.

Contents include papers on original research, both basic and applied, articles on current topics and issues, abstracts, book reviews, annotated bibliographies on selected topics, and management information data on child nutrition programs. Letters to the editor or relevant commentary on previously published papers or current issues in school food service also will be published.

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In & Out

Getting children to participate in school meal programs has challenged many school food service managers since funding for such programs was initiated. This issue of Research Review focuses on child nutrition program participation and includes a number of articles on this topic.

Immediately following these editorial comments, Dr. Josephine Martin, the executive director of the National Food Service Management Institute (NFSMI), discusses the mission and goals of the NFSMI. A new section, written by Dr. Jeannie Sneed, director of applied research for the NFSMI, begins this issue. Dr. Sneed highlights the NFSMI’s research plan and discusses progress on their research. We are excited to have her NFSMI Research Update as a regular feature in Research Review.

Two Current Issue articles appear in this issue. The first, by Nestlé, discusses rationale for recent policy recommendations regarding changes needed in school lunch programs to meet the current Dietary Guidelines. The article also discusses societal barriers to implementing improved school nutrition programs. The second Current Issues article, by Morcos and Spears, reviews research on factors affecting school lunch participation. The article includes an extensive table that summarizes key findings of research conducted on participation.

The Current Research section opens with an article by Sneed on continuing education for school food service supervisors. She suggests that areas of greatest importance for continuing education for school food service supervisors are personnel management, employee orientation and training, and menu planning. She recommends presenting programs in locations convenient to the supervisor’s job.

Smith reports results of a study comparing student and food service staff ratings of food preferences. His results suggest that although food service staff may not be able to accurately predict the degree to which students prefer food items, they are able to predict student’s relative food preferences.

The issue of high school students’ participation in and attitudes toward school lunch is the focus of the study by Fogleman et al. Their results suggest that taste of food and time it takes to get through the lunch line are primary reasons students do not participate in school lunch.

The Research in Action section includes an article by Rohrer that discusses the development of a three-phase wellness and nutrition program for Florida school food service employees. The program includes awareness, assessment, and intervention components and was well received by food service employees.

The Professional Development article by Cloud provides valuable information to assist food service professionals provide meals for children with special needs. The article describes various chronic conditions that require special attention by food service employees.

The Current Resources section includes an extensive bibliography by Smith on
child nutrition program participation. The bibliography presents a compilation of information written in the past 25 years on participation in the National School Lunch and School Breakfast Programs.

Abstracts are included of current articles in the areas of computers, employee training, food service management, food safety, nutrition, and environmental issues. The Book Review section contains reviews of several books which focus on feeding and preparing foods for young children. Heimstra provides an overview of trends in program participation in the Program Data and Analysis section. And Zorn reports on research being conducted by the Food and Nutrition Services of USDA in the FNS Research Corner section.

Research Review is a peer-reviewed journal, which means that each article submitted for possible publication will be reviewed by three members of an editorial review panel. These panel members make recommendations to the editor on whether the manuscript should be published. Editorial review panel members are appointed by the School Food Service Research Review Advisory Board and begin their terms in January of each year.

We would like to take this opportunity to thank Dr. Barbara Almanza, Ruth Gordon, and Connie Stefkovich, whose terms as review board members have ended. They have spent many hours reviewing manuscripts for Research Review and have helped maintain the quality of the publication through their careful critiques.

We welcome the following as new review board members: Donna Beard, Dr. Gail Frank, Helene Jensen, Dr. Carol Shanklin, Dr. Connie Vickery, and Shirley Watkins. Each has the expertise needed in nutrition or food service management to continue the important function the review panel serves in maintaining the integrity of Research Review.

We hope you will benefit from the information presented in this issue. We invite your comments and suggestions. We also encourage both researchers and practitioners to submit papers on your research for consideration by the review panel.

Mary B. Gregoire, PhD, RD
Editor

Marian C. Spears, PhD, RD
Associate Editor
Guest Editorial

Fourteen years ago, the Guest Editorial in the first issue of Research Review began “The School Food Service Research Review marks another milestone in the growth of the American School Food Service Association.” It is appropriate for this editorial to begin in a similar manner. The National Food Service Management Institute (NFSMI) marks another milestone in the growth of child nutrition programs.

Creation of a National Food Service Management Institute was first formally proposed at the American School Food Service Association’s Long Range Planning Seminar in 1976. The NFSMI was part of the conferees’ vision for the future of child nutrition programs.

Today, that vision is a reality, thanks to the tenacity of ASFSA leaders. To have this long-sought institution in place and functioning marks another milestone for both school food service professionals and for child nutrition programs.

Child nutrition programs occupy an important place in the health of children. They influence their academic performance and knowledge of the relationship between diet and health. And they meet their school day nutrition needs.

Over the past half century, these programs have grown phenomenally in both size and quality. This growth reflects both a commitment by the federal government to support the provision of meals for children and an awareness by the local community of the value of the service. Nevertheless, the major role of the programs in children’s health and education has been difficult to communicate to the larger community of education and health decision makers. Too often, the programs have been viewed simply as food service.

The NFSMI can serve to articulate the goals and purpose of the nutrition programs and the relationships between federal and community responsibilities for the nutritional health of children. It can serve as a center for change and growth.

The NFSMI’s mission as outlined in the authorizing legislation is as follows: to conduct research, education, and training and provide a clearinghouse for dissemination of information for the purpose of improving the quality and operation of child nutrition programs.

Research in the area of child nutrition has, in fact, been limited. This mandate is a significant step toward closing the research gap in the design for child nutrition programs. With the establishment of the NFSMI, research dealing with both the nutritional and managerial aspects of the programs becomes an integral part of the development process. The NFSMI research effort will support current research initiatives and provide opportunities for researchers in other academic settings to explore areas relevant to child nutrition programs.

Also affected is the professional nature of the child nutrition field. Many years ago, the late Dr. Neige Todhunter, former Dean of Home Economics at the University of Alabama and past president of the American Dietetics Association, defined a profession as having three characteristics: it is research based, it has
defined competencies, and it has a code of ethics. With the implementation of
the congressional design for the NFSMI, the professional gap may be closed.

Here are the NFSMI's three basic functions as outlined in the law:

• to conduct research to assist schools and other organizations that participate
in such programs in providing high quality, nutritious, cost-effective meal ser-
vice to the children served;

• to provide training and technical assistance with respect to all areas of oper-
ations, to establish a national network of trained professionals to present training
programs and workshops for food service personnel, to develop training materi-
als for use in the programs and workshops, and

• to act as a clearinghouse for research, studies and findings concerning all
aspects of the operation of child nutrition programs including NBT activities.

Thus, our success in helping schools improve the quality and operation of
child nutrition programs depends upon both research and education.

Research can identify more effective ways of improving the nutritional status
of the nation's youth. Identifying and providing professional educational oppor-
tunities can help personnel develop the competence needed for delivering quality
programs to children.

We hope that a number of reports from the first year's operation of the
NFSMI's Division of Applied Research will be of interest to readers of Research
Review. I am pleased that the Research Review will carry a regular column of
news from the NFSMI and research notes from the U.S. Department of
Agriculture's Food and Nutrition Service (FNS).

Finally, I see establishment of the NFSMI as the logical progression of a con-
gressional commitment that began with passage of the National School Lunch
Act in 1946. The stated purpose was "...to safeguard the health and well-being
of the nation's children."

In establishing the National Food Service Management Institute, Public Law
101-147 expands the resources available to achieve that goal through well-run
child nutrition programs. It also strengthens the cooperative activity that has
been a hallmark of child nutrition.

At the national level, NFSMI operates through a cooperative agreement with
FNS. We consult child nutrition providers at the state and local level to keep
activities targeted to their needs. And we work with ASPCA leaders to coordi-
nate research, education, and training efforts. Through this active partnership,
NFSMI can help achieve President Bush's education goal for all of America's
children by the year 2000: healthy children, ready to learn.

Josephine Martin, PhD, RD
Executive Director
National Food Service Management Institute

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58-3398-0-036. This editorial does not necessarily reflect the view or policies of the U.S.
Department of Agriculture, nor does mention of trade names, commercial products, or
organizations imply endorsement by the U.S. Government.*
Societal Barriers to Improved School Lunch Programs: Rationale for Recent Policy Recommendations

Marion Nestle, PhD, MPH

In December 1990, the Citizens’ Commission on School Nutrition released its White Paper on School Lunch Nutrition (Citizens’ Commission, 1990). In this paper, the Commission called for immediate efforts by schools, the Department of Agriculture, and the Congress to bring school lunches into compliance with national dietary recommendations for health promotion and disease prevention. Its suggestions for specific steps to achieve this goal are summarized in Table 1.

The Citizens’ Commission was convened by the Center for Science in the Public Interest, a Washington, D.C., nutrition advocacy organization. Its 15 members, representing a wide variety of school, governmental, university, health, and community organizations, were united by a common goal—to strengthen the efforts of school food service personnel to provide the healthiest possible diets for children.

Creation of the Commission reflected concerns that the original purpose of the school lunch program—to help prevent nutritional deficiencies among low-income children—needed to be expanded to include prevention of chronic diseases that now constitute the leading causes of adult deaths in this country. Filling empty stomachs is still necessary, but no longer sufficient. Today, school menu planners also must respond to reports that the amounts of fat and sodium in the lunches greatly exceed current recommendations (Nicklas, Farris, Srinivasan, et al., 1989; McPherson, Nichaman, Kohl, et al., 1990; Parcel, Simons-Morton, O’Hara, et al., 1987). They have come under increasing pressure to provide...
Table 1. Recent policy recommendations for improved school lunch nutrition: Key examples

**Citizen’s Commission recommendations (1990)**

Schools should:
- Limit calories from fat to 35% (30% eventually), with no more than one-third from saturated fat.
- Serve fresh fruits and vegetables and legumes more frequently.
- Restrict sodium to 1,000 mg per lunch (800 mg eventually).
- Reduce levels of cholesterol, sugar, and certain food additives in the lunches.

The USDA should:
- Set nutritional standards for lunches, commodities, and vended foods.
- Require vendors to provide nutrition information.

**ASFSA legislative proposals (1991)**

Congress should:
- Increase the federal school reimbursement rate by $0.05 per meal to defray costs of implementing the Dietary Guidelines.
- Regulate sale and service of competitive foods.*
- Increase funding for the Nutrition Education and Training (NET) Program.*
- Amend the National School Lunch Act to permit exclusive service of low-fat milk.*
- Appropriately funds to study costs of school lunches and reasons for nonparticipation.
- Reduce the price of reduced-price meals.
- Provide technical assistance to help schools determine the feasibility of universal breakfast and lunch programs.
- Convene a White House Conference on child nutrition.

*Also recommended by the Citizen’s Commission

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**Scientific Rationale: Diet and Health**

Diet-related chronic diseases such as coronary heart disease, certain cancers, adult-onset diabetes, and stroke constitute the leading cause of deaths among adults in this country. Overwhelming evidence confirms the importance of diet in preventing these conditions and of dietary changes in reducing risk factors for them among adults (USDHHS, 1988; National Research Council, 1989) as well as children (Bush, Zucker, Theiss, et al., 1989; Howison, Nidermeyer, & Shortridge, 1988; Killen, Telch, Robinson, et al., 1988; Nicklas, Forcier, Farris, et al., 1989; Stone, Perry, & Luepker, 1989). This research has convinced policymakers that the typical American diet is too high in fat, saturated fat, cholesterol, salt, and sugar and that every adult and child over the age of two would be healthier eating less of these substances (National Cholesterol Education Program [NCEP], 1991; National Research Council [NRC], 1989; USDHHS, 1989).

The results of recent studies emphasize the need for such recommendations: they identify increasing levels of chronic disease risk factors—obesity, high serum cholesterol, and high blood pressure—and declining levels of fitness among children in this country. The 1987 National Children and Youth Fitness Study, for example, reported that children ages 6 to 9 carried more body fat and exercised less than children of those ages 20 years ago (USDHHS, 1987).

Data from four national surveys indicated that obesity in children ages 6 to 11 increased by as much as 54% from the early 1960s to the late 1970s (Gortmaker, Dietz, Sobol, & Wehler, 1987). The Bogalusa Heart Study found that children were about 6 pounds heavier on average in 1984 than they were in 1973, and more of them were overweight (Sheer, Freedman, Burke, et al., 1988); this same study found strong correlations between obesity, blood cholesterol, blood pressure and diet in children observed over a 10-year period (“Cardiovascular Risk Factors,” 1987). National dietary intake surveys suggest that the average U.S. child consumes more fat, saturated fat, and cholesterol than is recommended (Kim, Gorgen, Mallory, Dresser, & Carroll, 1990). These findings have led to the recommendation that meals meet the Dietary Guidelines for Americans (U.S. Department of Agriculture [USDA] and U.S. Department of Health and Human Services [USDHHS], 1990) and are lower in fat and sodium but contain more fiber.

Such pressure has been expressed in reports not only from advocacy groups (Morris, Bellinger, & Haas, 1991; Shattuck, 1992) but also from the federal government (USDHHS, 1988, 1990). In response, the American School Food Service Association (ASFSA) in its 1991 Legislative Issue Paper proposed that Congress mandate stronger policy recommendations to develop meals that will meet nutritional requirements, minimize chronic disease risks, and establish lifetime standards for healthy eating (American School Food Service Association, 1991). Table 1 summarizes some of these recommendations, as well. All groups concerned with this issue view schools as agencies that bear a special responsibility—and have a special opportunity—to set nutritional standards for American children.

This view derives from the substantial scientific evidence that links diet to disease prevention in adults as well as in children. It also derives, however, from recognition that many features of present-day society constitute barriers to implementation of dietary recommendations and that schools will be better able to improve their lunch programs when supported by policies that address these barriers.

This article reviews the scientific rationale for recent policy recommendations on school lunch nutrition, discusses some of the societal barriers that most affect school nutrition, and recommends stronger policies to address these barriers so as to improve school lunches and, therefore, the dietary intake, nutritional status, and overall health of American children.
to a growing consensus among pediatric authorities that dietary changes identical to those recommended for adults also should be recommended for children (American Academy of Pediatrics [AAP], 1986; LaRosa & Finberg, 1988; NCEP, 1991; Task Force Committee, 1983).

**BARRIERS TO DIETARY CHANGE**

Despite this consensus and the good intentions of many school food service directors (Hall & Read, 1990) school lunch programs have proved difficult to change. Researchers have identified key attitudinal, educational, and financial barriers at school sites that discourage staff from implementing dietary improvements and parents and children from supporting such improvements (DeMico, 1990).

Even more important from the policy standpoint, however, are interrelated forces in the larger society that have led to the delegation of an increasing range of child-rearing functions, including nutrition, to the schools. Among these forces, demographics, food system economics, children's food preferences, food marketing practices, and television viewing most greatly influence children's food choices and overall diets.

**DEMOGRAPHICS**

USDA data indicate that 46% of family food expenditures are for food and drinks served outside the home (Blaylock, Elitzak, and Manchester, 1990), and that sales of fast food alone accounted for 34% of the total (Manchester, 1991). This trend reflects current social and economic realities—more women are working outside the home, and people are working longer and longer hours (Schor, 1991).

The traditional American family, consisting of husband, wife, and two children, now describes only a fourth of families in this country ("Only One U.S. Family," 1991). Instead, more families are headed by single, working parents. One in four American children is raised in a family headed by one parent, often a divorced or unmarried mother, and one in five in a family with an income level below the federal poverty line (National Commission, 1991). For such children, the beneficial health and educational consequences of the school lunch program (Rush, 1984; Parker, 1989) seem especially valuable.

**FOOD SYSTEM ECONOMICS**

In 1989, Americans spent $515 billion for food and beverages. Purchases by government, businesses, and other institutions including schools accounted for 17% of this amount. Out of each food dollar, only $0.24 was spent for the food's farm value—the food itself. The rest went for added value such as service, packaging, transportation, fuels, rents, repairs, advertising, and profit. The profit share amounted to $0.225 on each of the $515 billion (Blaylock, et al., 1990).

To meet the needs of today's busy families, convenience and speed in preparation (Kleiman, 1989) have become principal driving forces for new food product development, and both children and adults are increasingly dependent on meals prepared outside the home in worksites, restaurants, and, of course, schools (Blaylock et al., 1990).

The new convenience products are not necessarily designed to meet dietary recommendations. In 1989, of the 9,000 new food products that were introduced into the marketplace, more than 1,300 were candy and snacks, another 1,300 were dairy items such as novelty ice creams, about 1,100 were new bakery products, and there were 900 new beverages, 500 new processed meats, 118 new breakfast cereals, and 69 new desserts of other types (Shapiro, 1990). In 1990, more than 10,000 new food products were introduced, 70 percent of them candy, condiments, breakfast cereals, beverages, bakery products, and dairy items (Gallo, 1991). Although many of these products eventually fail, some succeed; sales of candy, cola drinks, and potato chips and related snacks, for example, rose by 11, 13.5 and 23% respectively, between 1980 and 1986 (Blaylock, et al., 1990).

**CHILDREN'S FOOD PREFERENCES**

Marketers estimate that American children influence buying decisions involving about $1 billion per week. Children between the ages of 4 and 12 control about $8 billion in discretionary money and spend $2.2 billion of this amount annually on snacks and sweets; children aged 12 to 15 control about $10.5 billion ("Zillions," 1990). A survey conducted for the Kellogg Company reported that 56% of junior high and 74% of high school students said that they—not their parents—decide what the family will eat (Harris/Scholastic Research, 1989). One study identified candy and gum, soft drinks, snacks, and fast food among children's leading six food choices (Hinds, 1989).

An especially well-researched observational study revealed that children's most frequent food choices are, in order of frequency: candy, potato chips and other salted snacks, sweetened fruit drinks, presweetened breakfast cereals, carbonated beverages, cupcakes and doughnuts, milk, hamburgers, pasta, and fried chicken (Davidson, Hayak, & Altschul, 1986). When given freedom of choice and liberal allowances, children choose foods on the basis of taste preference, not nutrition.

**FOOD MARKETING PRACTICES**

Researchers have demonstrated that children's taste preferences are strongly influenced by advertising (Clancy & Helitzer, 1983). Out of every household food and beverage dollar, consumers pay $0.045 for advertising (Blaylock, et al., 1990). Food marketing firms spent nearly $12 billion in 1990 for direct consumer advertising (Gallo, 1991).

In 1987, among 225 television commercials shown on three national networks during one Saturday morning, 56% were for presweetened breakfast cereals, cookies, candy, gum, snacks, beverages and beverage mixes, and desserts (Cotunga, 1988). Four years later, a similar study found that the number of commercials targeted to children during Saturday morning viewing hours had increased to 350; of these, 222 were for food products, 90% of them cereals, fast foods, candy, drinks, and snacks, low nutritional value (Burros, 1991). Investigators have demonstrated that such advertisements correlate well with children's requests for advertised food items as well as with parents' purchases of such items (Clancy & Helitzer, 1983).

**TELEVISION VIEWING**

Many studies have described the substantial impact of television on the health, physical fitness, and social outlook of American children. In 1989, a Nielson report found that the average child in the U.S. spent more time watching television—at least 22 hours
weekly—than doing anything else except sleeping (AAP Committee on Communications, 1990). Researchers have identified correlations between viewing of televised food commercials and caloric intake (Taras, Nader, Sallis, et al., 1989), a finding that is consistent with increasingly impressive evidence for a direct association between the number of hours of television viewing and levels of obesity (Dietz & Gortmaker, 1985; Dietz & Strasburger, 1991).

Other researchers, impressed by correlations between children’s high blood cholesterol levels and television viewing habits, find questions about television viewing to provide better predictive value than conventional questions when screening children for early heart disease (Goldsmith, 1990). These disturbing findings, among others, have prompted the American Academy of Pediatrics to recommend limits on television viewing hours, promotion of critical viewing skills, and controls over the content of programs and commercials directed toward children (AAP Committee on Communications, 1990).

**Policy Recommendations**

In view of these forces, it is not surprising that Americans continue to use high levels of dietary fat and sweeteners (Putnam, 1990), and that children prefer fatty, sweet, salty, easily consumed items readily identifiable by brand name, celebrity spokesperson, or advertiser. Food service personnel who wish to improve school lunches must confront an environment in which parents’ traditional responsibility for children’s nutrition has been delegated to the food industry, to the children themselves, and, by default, to the institutions that care for them. This delegation has occurred, however, without an equivalent transfer of the financial and other resources needed to carry out this function.

Given this situation, school personnel are faced with difficult choices. They can work to promote dietary changes by educating and training parents, teachers, and food service staff; through policy changes that regulate use of vending, fund-raising, and other competing foods; and through committees, surveys, meetings, and other organizing mechanisms created to promote behavior change (Children’s Nutrition Project, 1991).

Such actions are entirely worthwhile, but they are more likely to succeed when supported by federal, state, and local government mandates, policies, and funds. They might even be more effective if governmental policies addressed environmental—as well as individual—determinants of nutritional health. For example:

- Universal school meals for all children with no means testing or any other restrictions on eligibility.
- Full employment and income assistance policies that enable low-income families to purchase sufficient and appropriate food.
- Incentives to the food industry to produce and market healthier foods for children.
- Restrictions on the number and content of commercials shown on television during programs directed toward children.
- Incentives to schools to provide healthier lunches.
- Universal nutrition education for teachers and children.

Implementation of such recommendations will be costly (National Commission, 1991), but such costs should be kept in perspective. This country is wealthy enough to provide an adequate and appropriate diet to every school-age child. Without significant national debate, our government will manage to find the $500 billion or more that will be needed to compensate for losses of the savings and loan industry (Rosenbaum, 1990). Some experts estimate that an equivalent amount will be needed to pay for the costs of the recent war in the Persian Gulf and its long-term consequences—the debts of our allies, reconstruction of Iraq and the Kuwait oilfields, resettlement of the Kurdish people, and veterans’ benefits, for example (Askarı, 1997; Laug, 1991). Amounts of this magnitude are sufficient to fund the entire cost of federal food assistance programs for at least 20 years and of the school lunch program alone for more than a century.

Cost, therefore, is a matter of competing priorities. If tomorrow’s adults are going to lead healthy, productive lives, today’s school children must be guaranteed an adequate, nutritious diet. Children’s nutrition—in school and elsewhere—deserves a higher priority on our national agenda.

School associations should be lobbying actively for this higher priority and for stronger and more effective child nutrition policies. Such action is justified by the pressing and well-documented need to reduce childhood risks for chronic disease, by the schools’ increasing responsibility for ensuring the nutritional health of American children, and by the relatively low cost but high long-term health benefits of school lunch programs (Rush, 1984; Parker, 1989). The recommendations of the Citizens’ Commission on School Nutrition White Paper and of the ASPFA 1991 Legislative Issue Paper deserve immediate support and action for implementation.

**References**


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Current Issues

Food and Health Policy.


The National School Lunch Program: Factors Influencing Participation

Sharon Hearne Morcos, MS, RD, and Marian C. Spears, PhD, RD

The purpose of this paper is to review research on factors affecting school lunch participation. The National School Lunch Program (NSLP) experienced a drop in participation of approximately three million children following budget reductions in 1980 and 1981. Escalating food and labor costs, reduced commodity support, and potential decreased federal cash assistance threaten to drive up the price of the school lunch, once again forcing paying children from the program. Federal studies on participation by the United States Department of Agriculture and the Government Accounting Office, as well as two regional studies, are reviewed in this paper. Participation factors related to cost, availability of lunch options, meal acceptability, demographics, and school characteristics are summarized to provide a foundation for further research. School lunch participation has been identified as one of five critical research areas. Although the contribution of the NSLP to the nutritional needs of children is undisputed, program survival may depend on how effectively school food services can augment revenues and increase participation. Children remain the nation's most valuable resource. The question of how to improve participation thus must be answered if the next generation is to be prepared for the future.

This research was funded by the Kansas Agricultural Experiment Station, contribution #92-370-J.

Sharon Morcos is adjunct instructor in the Department of Hotel, Restaurant, Institution Management, and Dietetics at Kansas State University, Manhattan.

Marian Spears is professor emeritus at Kansas State University.

The National School Lunch Act of 1946, envisioned by Congress as a national security measure, had two objectives: safeguarding the health and well-being of children and encouraging domestic consumption of nutritious agricultural commodities (Public Law 79-396, 1946). This legislation established nutritional guidelines, nonprofit operation, and free or reduced-price lunches for economically deprived students as well as provided the first long-term commitment of funds and commodities for participating schools (Lachance, 1978). Assistance was to be supplemental only, encouraging states to assume increased financial and administrative responsibility for program operation (Wells, 1958). The National School Lunch Program (NSLP), therefore, was established as a joint endeavor of the federal, state, and local governments; schools; and children and their parents.

The NSLP enjoyed wide support throughout the 1950s ("Child Nutrition Programs," 1989). Increasing public awareness of the nutritional needs of children in the early 1960s led to enactment of the Child Nutrition Act of 1966 and, consequently, more comprehensive school feeding (Martin, 1978). This statute initiated pilot breakfast programs, authorized grants-in-aid for food service equipment in economically depressed areas, extended child nutrition programs to preschoolers, and established a special supplemental food program for pregnant women, infants, and young children at nutritional risk. Another provision of the Act was the administrative centralization of federal child nutrition programs within the Food and Nutrition Service (FNS) of the
Current Issues

United States Department of Agriculture (USDA) (Public Law 89-642, 1966). Expansion has included ongoing breakfast, child care, summer food, and special milk programs ("Child Nutrition Programs").

Numerous studies have documented the positive contribution of school feeding to the participants’ nutrient intake (Table 1). Federal support of child nutrition programs thus has been viewed as a long-term investment in public health (Congressional Budget Office, 1980).

Table 1. Selected studies related to nutrient intake of school feeding program participants

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<tr>
<th>Author(s)</th>
<th>Date</th>
<th>Study Details</th>
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<td>1972b</td>
<td>Investigated effect of school feeding programs on nutrient intake.</td>
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<td>Head &amp; Weeks</td>
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<td>Akin, Guilkey, Haines, &amp; Popkin</td>
<td>1983</td>
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<td>Akin, Guilkey, &amp; Popkin</td>
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<td>Gilbert, Newell, Vaden, &amp; Dayton</td>
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<td>Tseng, Sakai, Sun, &amp; Smith</td>
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<td>Tseng, Hoffman, &amp; Dutcher</td>
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<td>Wellisch, Hanes, Jordan, Maurer, &amp; Vermeersch</td>
<td>1985</td>
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<td>Perry, Shannon, Stitt, &amp; Bonner</td>
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In the early 1980s, a faltering economy and growing national debt prompted passage of the Omnibus Reconciliation Act of 1980, followed by the Omnibus Budget Reconciliation Act (OBRA) of 1981. As part of the efforts to curb federal spending, child nutrition programs were included in budget cutbacks. A large decrease in program participation was expected due to reduced federal reimbursements, tightened eligibility status for free and reduced-price lunches, increased meal prices, and exclusion of private schools with average tuition more than $1,500/year (Child Nutrition Programs, 1989; Martin, 1980; Hiemstra, 1982).

Hiemstra (1982) reported a drop in NSLP participation of 11% between 1981 and 1982, although the decline was not as great as anticipated. Reduction of federal subsidies for the paying child has the effect of targeting benefits to the economically neediest children. Research indicates, however, that nutritional need is not synonymous with economic need (Emmons, Hayes, & Call, 1972). The original intent of Congress was not to design a welfare or income-transfer program, but rather to provide broad-based nutritional support for all children, regardless of income ("Child Nutrition Programs," 1989; Vaden, 1979).

The National Evaluation of School Nutrition Programs report (Wellisch et al., 1983) warned that altering major policies to control costs can have different, but not immediately apparent, effects on distribution of benefits to various subpopulations of participants. Grant and Minnick (1983) agreed that the changing attitude toward government responsibility in the NSLP requires research on the impact of abrupt subsidy reductions on individual school districts. According to Vaden (1981), the future success of child nutrition programs depends upon efficient, effective use of public funds and upon response to participants’ needs and desires.

School lunch participation is one of five critical areas identified in the 1985 Report on School Food Service Research Needs (Matthews, Bedford, & Hiemstra, 1986). Because the contribution of the NSLP to the nutritional needs of children is undisputed, maintaining or increasing participation is essential. The General Accounting Office (GAO) has recommended that the relative importance of individual factors affecting participation be determined (USGAO, 1977). The purpose of this paper, therefore, is to review research on the topic, providing a foundation for future studies of factors leading to increased participation.

Current Program Statistics

The NSLP, permanently authorized under the National School Lunch Act, is the largest federal child nutrition program, providing meals to 24 million children each school day. Approximately half of the recipients are needy children who receive a free or reduced-price meal; the remainder pay full price, with charges determined by local school authorities ("Child Nutrition Programs," 1989).

The federal school lunch budget for fiscal year 1990 was approximately $3.8 billion, of which 84% represents cash reimbursements for meals served. The remainder is for USDA entitlement and bonus commodities (Hiemstra, 1991). Added to the federal budget are state matching funds and the revenue generated by the paying child.

Federal cash and commodity reimbursement for each meal served is legislated and adjusted for inflation. Although all meals receive a minimal cash and commodity subsidy, additional reimbursements are provided for each lunch served to a needy child. Children whose family income is 130% or less of the federal poverty income guidelines are eligible for free meals, whereas reduced-price meals are available for those whose family incomes fall between 130% and 185% of the guidelines ("Child Nutrition Programs," 1989).

Table 2 provides program statistics for NSLP program participation for fiscal years 1977 through 1990. Increased lunch prices, resulting from escalating food and labor costs and reduced USDA bonus commodity support, probably are responsible for recent drops in paid participation. Increases in the number of free and reduced-price meals appear to be related to worsening economic conditions and rising unemployment (Hiemstra, 1991).

Factors Affecting Participation

Because of the benefit of child nutrition programs to the nutritional intake of children, increased participation in both the school breakfast and lunch programs is desirable. Low participation, despite efforts to expand school feeding programs, was recognized as a major problem as early as the 1950s (Lachance, 1978). The majority of research conducted on school feeding participation generally has involved analysis of participation rates for regions, districts, or schools. Limited research exists to help identify determinants for individual student participation (Akin, Guilkey, Popkin, Bass, & Haines, 1981). Factors identified by Akin et al. (1981) and believed to influence participation may be clas-
sified into several broad categories: cost variables, availability of lunch options, meal acceptability, and demographics.

Other nonprice variables involved in participation have been identified (USGAO, 1977, 1981; Robinson, 1978). For example, students' opinions of the lunch and their choice of where and what to eat involve not only the food, but also the social aspect of dining (USGAO, 1977). Such factors influence participation decisions from day to day or over a longer period. The kind of food served and its method of preparation are associated with daily variation in participation rates, whereas granting permission to leave school premises during lunch is not (West & Hoppe, 1973). Independent variables affecting participation include enrollment, average daily attendance, size and location of community, grade levels within schools, percentage of students bussed, weather, season, gender, race, and age (Hemstra, 1983; Ottman, 1957; Keyser, Vaden, & Dayton, 1983).

**MAJOR REPORTS ON PARTICIPATION**

**Federal.** A USDA study of more than 83,000 schools in 1975 indicated participation rates were highest in schools with on-site preparation. Base schools preparing food for off-site distribution had somewhat lower participation rates than recipient schools. Most base schools were secondary level, which generally have lower participation than elementary schools. A la carte availability was associated primarily with secondary schools and decreased participation. Open-campus policies were found most often in elementary schools where children could walk home for lunch. Student participation was significantly higher in closed-campus schools. Participation was also higher in schools with lunch periods of 25 minutes or less. Researchers theorized that this relationship was not causal, but instead reflected NSLP competition resulting from the opportunity to pursue alternative food choices when more time was allowed (Robinson, 1978).

In 1977, GAO submitted a report to Congress identifying shortcomings in both evaluation and performance of the NSLP. Areas of investigation included impact of the NSLP on the health of participants, effect on demand for agricultural commodities, participation, and cost effectiveness of the program (USGAO, 1977). Factors influencing participation, development of nonparticipant profiles, and the effect of nonparticipation on health were considered in assessing program coverage. Report recommendations included encouraging higher levels of student participation and developing a "unified explanation" for the causes and impacts of changes in program participation rates. The USDA, in commenting on the study, stated that priorities for factors affecting participation should be established. Determination of the extent to which such factors individually and collectively influence participation was advocated as well. The FNS also conducted a study in 1977 and found that participation in the NSLP was lower than it should or could be (U.S. Department of Agriculture, 1977).

Another GAO report, released in 1981, discussed results of examining seven school districts considered innovative in their approach to NSLP problem-solving. Although offering secondary school students a greater food selection and improving the lunchroom environment had a beneficial effect upon participation, researchers found that none of the lunch formats met the program goal of providing one-third of the Recommended Dietary Allowances (RDAs) (USGAO, 1981).

The 1983 National Evaluation of School Nutrition Programs (NESP) was initiated in 1979 with funding from a USDA contract (Wellisch et al., 1983; Radzikowski, 1983). Primary objectives of the evaluation were to:

- synthesize existing research and evaluate data on school nutrition programs,
- identify determinants of participation and develop statistical models for use in forecasting participation rates,
- determine the impact of school nutrition programs on students and their families, and
- determine if existing benefit levels are appropriate for participants' needs.

The study, surveying approximately 6,500 families, indicated that while NSLP participation was higher among low-income students, substantial numbers of students from all income and ethnic groups participated. Frequent participants of the school lunch program generally lived in rural areas, were unable to go home for lunch, had parents who determined where lunch was to be eaten, and attended schools in...
which faculty and staff ate with students. Supplemental material from a symposium on the NESNP study may be found in the August 1984 issue of the American Journal of Clinical Nutrition.

The USDA conducted a follow-up to the NESNP study, often referred to as NESNP II, during the 1983-84 academic year. Data showed that the NSLP was available to almost 99% of all public school students. In general, younger children participated more frequently than their older counterparts, and participation was highest for students receiving free lunches. Family composition data also was included in the study (USDA, 1988).

Discrepancies in the assignment of children to the various payment categories were reported. Only 80% of free meals were served to children whose families actually met the income guidelines. Misclassifications of eligibility, change in family income since initial certification, and possible mistakes in reporting of income or price status during the survey were given as likely causes. In some cases, children were overcharged; one-third of the students receiving reduced-price lunches were eligible for free, and 22% of children paying full price reported income that would qualify them for reduced-price or free lunches. These children may have been declared ineligible or simply had not applied. Of the children who potentially qualified for free or reduced-price lunches but did not apply, 70% of their parents thought they were ineligible, and 38% did not wish to apply for various reasons although they believed they qualified (USDA, 1988).

In 1984, the GAO was asked to analyze participation in the NSLP during the years immediately preceding and following the omnibus reconciliation legislation. Participation in the program had dropped from 27 million in 1979 to 23.1 million in 1983, chiefly because fewer paying children ate school lunch. In 1982, for the first time in the history of the NSLP, more free and reduced-price lunches were served than those at full price. Both the number of families with children eligible to receive free lunches and the percentage of federal expenditures for free lunches increased during the period reviewed. Federal monies for reduced- and full-price lunches, however, decreased. The decrease in student and school participation was slightly greater than the national decline in enrollment and number of schools (USGAO, 1984).

The U.S. House of Representatives' Committee on Education and Labor released a report in December 1988 entitled Child Nutrition Programs: Issues for the 101st Congress ("Child Nutrition Programs," 1989). The document provides a comprehensive history of child nutrition programs and an overview of research on the effect of hunger and malnutrition on student achievement. Also included is a section on the relationship between general assistance funding (Section 4 funds, the reimbursement for full-price meals) for supporting the infrastructure of the NSLP and program participation. The Committee indicated that significant reductions in Section 4 funding in 1981 resulted in increased lunch prices, forcing children from the program. Approximately two-thirds were paying children, but the remainder were needy children who lost access to school lunch when their schools withdrew from the program. According to a Library of Congress investigation requested by the Committee in 1985, schools with the highest percentage of paid lunches are most dramatically affected by elimination of the paid subsidy, and thus may be at most risk of withdrawing from the program.

The "Child Nutrition Programs" report also included a survey of state officials to document effects of the 1981 child nutrition budget cuts. Samples of comments received are provided, which verify the Committee's concern regarding the relationship between paid subsidy and NSLP participation.

Regional. In 1979, Keyser et al. (1983) surveyed randomly selected schools from four states within the USDA/FNS Mountain Plains Region to assess factors affecting participation in child nutrition programs. Results indicated that average daily participation (ADP) of students in the NSLP varied significantly among schools, with participation lowest in secondary schools in the largest population areas. Significant positive predictors of ADP were the percentage of students eligible to receive free or reduced-price meals and the food quality score, which is an index measuring practices related to food production and service. Higher participation rates were found in schools that followed quality control practices regularly. Student involvement supported program success, as indicated by positive student acceptance scores in secondary schools. Lower participation rates were associated with the availability of school lunch program alternatives in secondary schools. Meal price was not found to be a significant predictor of participation.

Hearne (1984) extended the research of Keyser et al. (1983) by compiling a 1983 database to assess the impact of legislative changes since 1980 on program participation; a comparative analysis of changes from 1979 to 1983 then was conducted. The most dramatic change was the effect of meal price on participation; meal prices increased approximately 36% between 1979 and 1983, reflecting decreased federal subsidies for full-price meals. The result of these price increases was a significant drop in paid participation in all four states and in all population areas, accompanied by an increase in the percentage of meals served free. Overall NSLP participation decreased in all but one state. Results also indicated both increased food costs and numbers of students qualifying for free meals. Greater efforts to involve students and to improve food quality, however, were positive factors encouraging participation.

**Related Research on Participation Factors**

The price charged for meals is considered to be a primary factor influencing participation in child nutrition programs (Wellsch et al., 1983; West & Hoppe, 1973). Lower participation rates are associated with higher lunch prices. The price decisions of local school authorities affect the cost of NSLP lunches in individual districts, impacting the scope of program benefits on a national level (West & Hoppe, 1973). After omnibus reconciliation legislation, many school districts increased prices to compensate for reduced federal subsidies and higher food costs. December 1981 survey data reported by the USDA revealed a price increase of 25% in average full-price lunches; reduced-price lunch prices rose 200% (Hiemstra, 1983). A price increase of 10% generally is accompanied by a 3 to 6% drop in paid participation, with recovery of about half the loss over time (Simmons et al., 1972a; Hiemstra, 1983). The NESNP report indicated that the responsiveness of participation to the price paid for school lunch depends greatly on...
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<thead>
<tr>
<th>Factor</th>
<th>Author, date, reference</th>
<th>Conclusion</th>
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<tr>
<td>Cost</td>
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<tr>
<td>Free/reduced-price eligibility</td>
<td>USGAO&lt;sup&gt;b&lt;/sup&gt;, 1977</td>
<td>ADP&lt;sup&gt;b&lt;/sup&gt; increases with percent of students receiving free or reduced-price meals.</td>
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<tr>
<td></td>
<td>Perkins et al., 1980</td>
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<td></td>
<td>Garrett &amp; Vaden, 1978</td>
<td>Schools with the greatest number of free and reduced-price lunch applications have highest participation.</td>
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<td></td>
<td>Johnson, 1983</td>
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<td></td>
<td>Akin et al., 1981</td>
<td>Availability of free and reduced-price school lunches has significant positive effect on school lunch participation.</td>
</tr>
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<td></td>
<td>Hiemstra, 1983</td>
<td>Tightened eligibility by OBRA&lt;sup&gt;c&lt;/sup&gt; for free and reduced-price lunches caused decreased participation.</td>
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<td></td>
<td>Kayser et al., 1983</td>
<td>ADP as a percent of school enrollment increases as percent of students approved for free and reduced-price meals increases.</td>
</tr>
<tr>
<td></td>
<td>USGAO, 1964</td>
<td>More free or reduced-price lunches than full price were served following OBRA legislation than any other time in the history of the NSLP&lt;sup&gt;d&lt;/sup&gt;.</td>
</tr>
<tr>
<td></td>
<td>Hearne, 1984</td>
<td>Percent of students qualifying for free and reduced-price meals has a significant impact on participation.</td>
</tr>
<tr>
<td></td>
<td>Lind et al., 1986</td>
<td>Percentage of free and reduced-price meals appears to be a stronger influence on participation than serving style.</td>
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<tr>
<td></td>
<td>USDA&lt;sup&gt;e&lt;/sup&gt;, 1988</td>
<td>Participation is highest for students receiving free lunch, followed by reduced-price recipients.</td>
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<tr>
<td>Meal price</td>
<td>Kriesberg, 1964</td>
<td>Increased price is related to decreased participation.</td>
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<td></td>
<td>Freund, 1971</td>
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<td></td>
<td>Emmons et al., 1972b</td>
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<td>West &amp; Hoppe, 1973</td>
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<td>Braley &amp; Nelson, 1975</td>
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<td>USGAO, 1977</td>
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<td>Epps, 1978&lt;sup&gt;a,b&lt;/sup&gt;</td>
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<td>Howe, 1979</td>
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<td>USDA, 1979</td>
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<td>Akin et al., 1981</td>
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<td>Hiemstra, 1982</td>
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<td>Hiemstra, 1983</td>
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<td></td>
<td>Wellisch et al., 1983</td>
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<td>CNP&lt;sup&gt;f&lt;/sup&gt;, 1989</td>
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<td>Zacchino &amp; Ranney, 1990</td>
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<td>Hiemstra, 1991</td>
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<tr>
<td></td>
<td>Law et al., 1972</td>
<td>Participation not affected by lunch prices according to parents’ response.</td>
</tr>
<tr>
<td></td>
<td>Gargano, 1976</td>
<td>Low prices appear to influence student participation.</td>
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<tr>
<td></td>
<td>Robinson, 1978</td>
<td>Increased lunch prices decrease paid participation at elementary and secondary levels and by region.</td>
</tr>
<tr>
<td></td>
<td>Grant &amp; Minnick, 1983</td>
<td>Increased student cost for lunches produces increased revenue despite decreased participation.</td>
</tr>
<tr>
<td></td>
<td>Kayser et al., 1983</td>
<td>Price is not a significant positive predictor of ADP.</td>
</tr>
<tr>
<td></td>
<td>Wellisch et al., 1983</td>
<td>Meal price is the single most important factor affecting frequency of participation.</td>
</tr>
<tr>
<td></td>
<td>USGAO, 1984</td>
<td>OBRA legislation may have shifted some students into price categories requiring more payment for lunches, thus causing some students to bring their lunch.</td>
</tr>
<tr>
<td></td>
<td>Hearne, 1984</td>
<td>Meal prices increased 36% from Kayser’s findings. Higher prices are a negative predictor of overall ADP rate and % ADP for the paying child.</td>
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### Table 3. Continued

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<tr>
<td><strong>Availability of Lunch Options</strong></td>
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<tr>
<td>A la carte</td>
<td>Kriesberg, 1964</td>
<td>Participation is slightly less in schools that allow purchase of milk without meals.</td>
</tr>
<tr>
<td></td>
<td>USGAO, 1977</td>
<td>A la carte availability decreases participation.</td>
</tr>
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<td></td>
<td>Epps, 1978a,b</td>
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<tr>
<td></td>
<td>Robinson, 1978</td>
<td></td>
</tr>
<tr>
<td>Proximity of other lunch sites</td>
<td>Kriesberg, 1964</td>
<td>If time and transportation is available, opportunity for lunch at home decreases participation.</td>
</tr>
<tr>
<td></td>
<td>USDA, 1972</td>
<td>High participation schools with an open campus option often are located in rural areas where no competitive food services exist.</td>
</tr>
<tr>
<td></td>
<td>West &amp; Hoppe, 1973</td>
<td>Distance of school from restaurants and children's homes may influence participation.</td>
</tr>
<tr>
<td></td>
<td>Freund, 1971</td>
<td>Open campuses have lower participation rates.</td>
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<td>West &amp; Hoppe, 1973</td>
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<td></td>
<td>USGAO, 1977</td>
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<td></td>
<td>Epps, 1978a,b</td>
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<td></td>
<td>Robinson, 1978</td>
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<td></td>
<td>Law et al., 1972</td>
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<tr>
<td>Number of options</td>
<td>Keyser et al., 1983</td>
<td>Many tenth graders eat school lunch because schools often have closed campuses; some dislike this policy, however.</td>
</tr>
<tr>
<td></td>
<td>Hearne, 1984</td>
<td>Lower participation rates are associated with a greater availability of alternatives to the NSLP.</td>
</tr>
<tr>
<td><strong>Meal Acceptability</strong></td>
<td></td>
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<tr>
<td>Attitudes of faculty and staff</td>
<td>Garrett &amp; Vaden, 1978</td>
<td>Food service personnel influence students' reactions to the food and program.</td>
</tr>
<tr>
<td></td>
<td>Evans &amp; Vaden, 1979</td>
<td>Nonparticipants are more likely to believe teachers have negative views of school lunch.</td>
</tr>
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<td></td>
<td>Howe, 1979</td>
<td>Participation increases as a function of how resistant teachers are toward eating with their classes, implying that both students and teachers need a break from each other.</td>
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<tr>
<td></td>
<td>Perkins et al., 1980</td>
<td>School administration and faculty support of NSLP may affect participation rate.</td>
</tr>
<tr>
<td></td>
<td>Lind et al., 1986</td>
<td>Not wanting to eat lunch is a major reason for teenagers not eating school lunch.</td>
</tr>
<tr>
<td>Attitudes of students</td>
<td>Law et al., 1972</td>
<td>Attitude scores of frequent participants are higher than those of students who participate infrequently.</td>
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<tr>
<td></td>
<td>Gutch, 1977</td>
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<td></td>
<td>Garrett &amp; Vaden, 1978</td>
<td>Black students are more positive toward school lunch than white students; free-lunch recipients are more positive than those who pay full price.</td>
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<td></td>
<td>Evans &amp; Vaden, 1979</td>
<td>Positive student attitudes toward school lunch correlates positively with participation.</td>
</tr>
<tr>
<td></td>
<td>Howe, 1979</td>
<td>Majority of nonparticipants say food is poorly prepared, unattractive, and inadequate in portion size.</td>
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<tr>
<td></td>
<td>Head et al., 1981</td>
<td>Secondary schools preparing food for satellite facilities have somewhat lower participation.</td>
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<tr>
<td></td>
<td>Rethmeyer, 1988</td>
<td>Higher participation is found in schools with on-site production as opposed to satellite schools.</td>
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<td>Food quality</td>
<td>Law et al., 1972</td>
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<td></td>
<td>Howe, 1979</td>
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<td>Robinson, 1978</td>
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<td>Epps, 1978a</td>
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<td></td>
<td>Lilly et al., 1980</td>
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<td></td>
<td>Johnson, 1983</td>
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<th>Factor</th>
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<th>Conclusion</th>
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<tr>
<td><strong>Meal Acceptability</strong> (continued)</td>
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<tr>
<td>Perkins et al., 1980</td>
<td></td>
<td>A significant relationship exists between teachers’ perceived view of food quality and student participation.</td>
</tr>
<tr>
<td>Kayser et al., 1983</td>
<td></td>
<td>Higher participation occurs in schools in which food quality measures are used regularly.</td>
</tr>
<tr>
<td>Hearn, 1984</td>
<td></td>
<td>Use of food quality measures is a significant positive predictor of percentage of paid meals served.</td>
</tr>
<tr>
<td>Influence of parents and peers</td>
<td>Gargano, 1976</td>
<td>Parental wishes have a positive influence on participation.</td>
</tr>
<tr>
<td>Garrett &amp; Vaden, 1978</td>
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<tr>
<td>Evans &amp; Vaden, 1979</td>
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<tr>
<td>Howa, 1979 (51)</td>
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<tr>
<td>Wellisch et al., 1983</td>
<td></td>
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<tr>
<td>Garrett &amp; Vaden, 1978</td>
<td></td>
<td>Peer influence, especially the desire to eat with friends, is a reason for eating school lunch.</td>
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<td>Gargano, 1976</td>
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<td>Outesch, 1977</td>
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<tr>
<td><strong>Length of meal period</strong></td>
<td>Law et al., 1972</td>
<td>Waiting in line and insufficient time are major reasons for teenagers not eating school lunch.</td>
</tr>
<tr>
<td>Howa, 1979</td>
<td></td>
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<tr>
<td>USDA, 1972</td>
<td></td>
<td>Frequency of participation correlates with time available for lunch.</td>
</tr>
<tr>
<td>Harper et al., 1980a</td>
<td></td>
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<tr>
<td>Robinson, 1978</td>
<td></td>
<td>Higher participation is found in schools with lunch periods of 25 minutes or less.</td>
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<tr>
<td><strong>Lunchroom environment</strong></td>
<td>Law et al., 1972</td>
<td>Crowded, cramped conditions are a reason high school students dislike school lunch.</td>
</tr>
<tr>
<td>USDA, 1972</td>
<td></td>
<td>Participation is reduced when students equate &quot;oldness&quot; with unsanitary conditions.</td>
</tr>
<tr>
<td>Harper et al., 1980</td>
<td></td>
<td>Frequent participants are more positive in their rating of lunchroom environment than nonparticipants.</td>
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<tr>
<td>USGAO, 1981</td>
<td></td>
<td>Improving the lunchroom environment of high school students increases participation.</td>
</tr>
<tr>
<td>Sullivan &amp; Shanklin, 1985</td>
<td></td>
<td>Enhancing cafeteria decor and atmosphere helps increase participation.</td>
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<tr>
<td><strong>Menu selection choices</strong></td>
<td>West &amp; Hoppe, 1973</td>
<td>Variety of food served influences participants.</td>
</tr>
<tr>
<td>Guthrie, 1977</td>
<td></td>
<td>Participation does not increase significantly when flavored milk is offered to elementary school children, but more milk is purchased.</td>
</tr>
<tr>
<td>Heimberg, 1978</td>
<td></td>
<td>Family-style service increases participation rates.</td>
</tr>
<tr>
<td>Harper et al., 1980b</td>
<td></td>
<td>High school student participation increases when free choice lunches comprised of a la carte items are offered.</td>
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<tr>
<td>Jansen et al., 1980</td>
<td></td>
<td>Free choice selection of a la carte menu items is recommended to increase participation.</td>
</tr>
<tr>
<td>Marticotta &amp; Guthrie, 1980</td>
<td></td>
<td>Participation significantly increases when students are offered a choice of whole, skim, and lowfat milk.</td>
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<tr>
<td>USGAO, 1981</td>
<td></td>
<td>Offering secondary students greater food selection appears to increase participation in all payment categories.</td>
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<tr>
<td>Matern, 1982</td>
<td></td>
<td>Use of offer vs. serve with elementary students results in increased participation.</td>
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### Table 3. Continued

<table>
<thead>
<tr>
<th>Factor</th>
<th>Author, date, reference</th>
<th>Conclusion</th>
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<tr>
<td><strong>Meal Acceptability (continued)</strong></td>
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<tr>
<td>Promotion</td>
<td>Keyser et al., 1983</td>
<td>As more menu choices are offered and as food production controls are utilized, participation increases.</td>
</tr>
<tr>
<td></td>
<td>Garrett &amp; Vaden, 1978</td>
<td>Publicity campaigns have little effect on ADP.</td>
</tr>
<tr>
<td></td>
<td>Robinson, 1978</td>
<td>Advance publication of menus is associated with lower participation.</td>
</tr>
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<td></td>
<td>Sullivan &amp; Shanklin, 1985</td>
<td>A majority of school food service directors use promotion and advertising activities to increase participation.</td>
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<td></td>
<td>Kret, 1986</td>
<td>Promotional techniques do not have a significant effect on participation rates in elementary schools.</td>
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<td>Student involvement</td>
<td>Garrett &amp; Vaden, 1978</td>
<td>ADP increases significantly when student-selected menus are implemented.</td>
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<tr>
<td></td>
<td>Evans &amp; Vaden, 1979</td>
<td>Participation is not affected by implementation of student advisory councils. Frequent participants express greater interest in being involved.</td>
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<tr>
<td></td>
<td>Howe, 1979</td>
<td>Both participating and nonparticipating students express interest in joining a student advisory council.</td>
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<tr>
<td></td>
<td>Keyser et al., 1983</td>
<td>Student involvement significantly affects participation in secondary schools.</td>
</tr>
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<td></td>
<td>Hearne, 1984</td>
<td>Regular student involvement is predictive of increased participation.</td>
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<td><strong>Demographics</strong></td>
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</tr>
<tr>
<td>Age and gender</td>
<td>Akin et al., 1981</td>
<td>Peak participation age is 12; being either older or younger decreases participation. Gender appears to have no effect.</td>
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<tr>
<td></td>
<td>USDA, 1988</td>
<td>Younger students are more likely to participate.</td>
</tr>
<tr>
<td></td>
<td>Akin et al., 1981</td>
<td>Children of single parents have significantly decreased participation.</td>
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<tr>
<td></td>
<td>Wellisch et al., 1983</td>
<td>Participation is highest among large and single-parent families.</td>
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<td></td>
<td>USDA, 1988</td>
<td>Proportion of participants from single and two-parent families varies based on type of lunch received: free, reduced, or full price.</td>
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<tr>
<td></td>
<td>Perkins, 1980</td>
<td>Participation is not influenced by the number of students with working mothers.</td>
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<td></td>
<td>Akin et al., 1981</td>
<td>Working mothers increase the probability of participation for older children.</td>
</tr>
<tr>
<td></td>
<td>Lind et al., 1986</td>
<td>Proportion of working mothers may affect participation rate.</td>
</tr>
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<td>Employment of parents</td>
<td>Akin et al., 1981</td>
<td>Family income in the bottom one-third of a low-income sample are more likely to participate. Added income reduces probability of participation.</td>
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<td>Family income</td>
<td>Wellisch et al., 1983</td>
<td>Participation is highest for students whose families are in the lowest quartile of total and per capita income.</td>
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<td>Race</td>
<td>Akin et al., 1981</td>
<td>White secondary students are least likely to participate. Minorities have higher participation rates than white students, although two-thirds of program participants are white.</td>
</tr>
<tr>
<td>Factor</td>
<td>Author, date, reference</td>
<td>Conclusion</td>
</tr>
<tr>
<td>----------------------</td>
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<td><strong>School characteristics</strong></td>
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<td></td>
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<tr>
<td>Enrollment</td>
<td>West &amp; Hoppe, 1973</td>
<td>Smaller, nonmetropolitan districts have higher participation.</td>
</tr>
<tr>
<td></td>
<td>Epps, 1978a</td>
<td>Participation is significantly lower in schools of more than 1,000 students.</td>
</tr>
<tr>
<td></td>
<td>Hiemstra, 1983</td>
<td>Following OBRA legislation, total participation decrease was in line with falling school enrollment and decline in number of schools with programs.</td>
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<td>Grade level</td>
<td>Kriesberg, 1964</td>
<td>Secondary schools generally have lower participation rates than elementary.</td>
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<tr>
<td></td>
<td>Freund, 1971</td>
<td></td>
</tr>
<tr>
<td></td>
<td>West &amp; Hoppe, 1973</td>
<td></td>
</tr>
<tr>
<td></td>
<td>USGAO, 1977</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Robinson, 1978</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lilly et al., 1980</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hiemstra, 1983</td>
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</tr>
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<td></td>
<td>Keyser et al., 1983</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hearne, 1984</td>
<td></td>
</tr>
<tr>
<td>Location and size</td>
<td>Kriesberg, 1964</td>
<td>Participation is lower in heavily populated areas and higher in rural, smaller schools.</td>
</tr>
<tr>
<td></td>
<td>Freund, 1971</td>
<td></td>
</tr>
<tr>
<td></td>
<td>West &amp; Hoppe, 1973</td>
<td>Smaller, nonmetropolitan districts have higher participation.</td>
</tr>
<tr>
<td></td>
<td>Akin et al., 1981</td>
<td>Urban location has no effect on participation.</td>
</tr>
<tr>
<td></td>
<td>Keyser et al., 1983</td>
<td>Participation is lowest in urban high schools.</td>
</tr>
<tr>
<td></td>
<td>Hearne, 1984</td>
<td></td>
</tr>
<tr>
<td></td>
<td>USGAO, 1984</td>
<td>Schools dropping out of the NLSP following OBRA legislation tend to be in small, rural, affluent districts.</td>
</tr>
<tr>
<td>Percentage of bussed students</td>
<td>Perry et al., 1984</td>
<td>Participation is higher among rural students.</td>
</tr>
<tr>
<td></td>
<td>Porkins et al., 1980</td>
<td>Bussing correlates positively with participation.</td>
</tr>
<tr>
<td></td>
<td>Keyser et al., 1983</td>
<td>Bussing is related to increased percentages of paid meals in elementary and combined schools.</td>
</tr>
<tr>
<td></td>
<td>Hearne, 1984</td>
<td>ADP is not affected significantly by percentage of students bussed.</td>
</tr>
</tbody>
</table>

aU. S. General Accounting Office
bAverage daily participation
\textsuperscript{c}Omnibus Budget Reconciliation Act
dNational School Lunch Program
eU. S. Department of Agriculture
fChild Nutrition Programs
\textsuperscript{g}Food service operation serves both elementary and secondary students
the level of those prices (Wellisch et al., 1983). Prices that are higher than average tend to have a greater initial impact when increased (Hicimstra, 1977).

Other factors that have been investigated in regard to NSLP participation include:
- free and reduced-price meal eligibility,
- availability of a la carte items,
- proximity of other lunch sites,
- number of options available to students,
- attitudes of faculty, staff, and students toward the school lunch program,
- food quality,
- influence of parents and peers,
- length of meal period,
- lunchroom environment,
- menu selection choices,
- promotion,
- student involvement,
- demographics, and
- school characteristics.

A summary of research related to these factors as well as meal price is provided in Table 3.

SUMMARY AND CONCLUSIONS

Many school lunch programs have had financial problems caused by low participation rates, reduced school budgets, and decreased federal cash reimbursements and commodity assistance. The fear that followed the 1980-81 budget cuts once again clouded the horizon. School food services have been audited since 1980 by state authorities using federal guidelines under the Assessment, Improvement, and Monitoring System. In 1989, however, federal officials began on-site reviews, claiming the state system was inadequate in examining eligibility for free and reduced-price lunches. The result of these audits has been heavy penalties for even the simplest clerical errors, placing pressure on already strained budgets (Schuster, 1990a, 1990b).

Currently, an administrative proposal to reduce cash subsidies for the paid meal category and increase the reduced-price subsidy is before the Congress. Because more students who participate in the program pay full rather than reduced-price, the net effect would be an overall reduction of subsidies. The NSLP thus would become a "targeted program" for low-income children instead of remaining the education and nutrition program envisioned by Congress and supported by the American School Food Service Association (Wilde, 1991).

School food service directors will encounter even greater challenges in the years ahead; demographic projections indicate that by 2010, 12 million more children will need to be fed ("Shrinking Food Budget," 1990). In addition, the Public Health Service is suggesting that at least 90% of men in child nutrition programs be consistent with the Dietary Guidelines for Americans (U. S. Department of Health and Human Services, 1990). Greater budgetary problems could result if menu modifications make necessary the addition of food items to meet caloric needs. Program survival may depend on how effectively school food service operations augment revenues and increase participation.

With today's children eating fewer meals at home, school lunch often is the most important meal of the day. Research clearly has established that children learn better when they are not hungry. The threat of continual federal budget cuts in child nutrition programs at the same time the academic performance of U.S. children is under scrutiny thus is a grave concern.

Children remain the nation's most valuable resource. Their dependence on families and communities to provide a nurturing environment will enable them to become healthy, productive adults (Spelt & Story, 1991). The question of how to improve participation thus must be answered if the next generation is to be prepared for the future.

REFERENCES


Garzaro, T. M. (1976). High school students' stated entry decisions as a fore-


Continuing Education Needs of School Food Service Supervisors

Jeannie Sneed, PhD, RD

This study determined perceived importance and continuing education needs for 55 job-related areas for school food service supervisors, compared importance and continuing education needs ratings with those of supervisors/managers in other types of food service operations, and determined preferred methods of continuing education program delivery. A questionnaire was mailed to school food service supervisors of the city/county school districts in Tennessee, to members of the Tennessee chapter of the American Society of Hospital Food Service Administrators, members of the management practice group of the Tennessee Dietetic Association, and a random sample of half of the members of the Tennessee Restaurant Association. For school food service supervisors, more than 90% rated state/federal regulations, personnel management, food production and delivery, equipment, financial management, menu planning, and management development as important or very important areas for their jobs. Continuing education needs for school food service supervisors were highest for personnel management followed by microcomputer applications, employee orientation and training, and menu planning. There were some differences in ratings for both importance and continuing education needs based on the food service setting. Because of their high rated importance and high need for continuing education, personnel management, employee orientation and training, and menu planning are important areas for continuing education programs. Based on responses to preferences for continuing education delivery, programs presented at a location convenient to the school food service supervisors’ job likely will be most successful, and educational programs presented on videotape may be an efficient, cost-effective delivery method.

The five-year strategic plan for the American School Food Service Association (ASPEA), “Shaping a Healthy Future 1991-1995,” envisions that by 1995 ASPEA will lead the way for healthy children through four initiatives. One of these initiatives focuses on “membership development demonstrated by members who are competent, confident and fulfilled professionally” (American School Food Service Association, 1991).

An obligation for continuing education is one criterion of a profession (Nowlen, 1988). The purpose of continuing education in a profession is to upgrade the competency of professionals through a self-improvement process. The Master Plan for Education and Professional Development (American School Food Service Association, 1987), developed by ASPEA, began the certification process for school food service personnel at the general assistant, technical assistant, manager, supervisor/specialist, and director/administrator levels. Continuing education is an integral component of continuing certification status.

Robinson (1987) concluded that developing continuing education programs that do not reflect the perceived needs of the individuals the programs are designed to serve may lead to problems. Continuing education needs have been identified for unit managers in schools (Robinson, 1987; Bowers, Vaden, Newell, & Dayton, 1982; Baird & Jones, 1981; Jones & Baird, 1981), for directors and supervisors in schools (Kende, Perkowski, Lackey, & Kolasa, 1980), for school food service personnel at all levels

This study was conducted in the Department of Nutrition and Food Sciences at the University of Tennessee and was funded through the Hal and Alma Reagan Endowment Fund.

Jeannie Sneed is director of the Division of Applied Research of the National Food Service Management Institute at the University of Southern Mississippi, Hattiesburg.
(Canter, 1988), and for dietetic practitioners (Flynn, Bryk, & Neal, 1991; Haughton & Taylor, 1988; Burkholder & Eisele, 1984; Vanderveen & Hubbard, 1979). Little recent research on continuing education needs has focused on the school food service supervisor at the school district level.

The primary purposes in this study were to determine school food service supervisors’ perceived importance of and continuing education needs in job-related areas and to compare importance and continuing education ratings of school food service supervisors with ratings of managers in other types of food service operations. In addition, preferences for methods of delivery for continuing education programs were determined.

**Methodology**

**Research Questionnaire.** Based on the research literature, the researcher developed a list of job-related areas important for the effective performance of an individual who manages a food service operation. A three-part questionnaire was developed. In Part I, respondents rated each area on its importance to the effective performance of their job and on need for continuing education. Two 4-point rating scales were used; responses ranged from 0 (not important) to 3 (very important) and from 0 (no need) to 3 (high need). Part II contained items to determine preferences for delivery of continuing education programs and for time of presentation for these programs. Part III included the demographic characteristics of gender, type of food service operation, professional memberships, and age.

The research instrument was pilot tested by individuals employed as supervisors/managers in schools, hospitals, nursing homes, and restaurants and by researchers/educators familiar with food service management. Based on their recommendations, areas were modified, added, and deleted. The resulting list contained 55 areas. Because the questionnaire was used for supervisors/managers in a variety of settings (schools, hospitals, nursing homes, and restaurants), all areas did not apply to all respondents, although, individuals who pilot tested the questionnaire did not perceive any major omissions in areas included.

**Research Sample.** Supervisors/managers employed in schools, restaurants, and health-care operations in Tennessee were included in the study. For schools, the food service supervisor in each of the 149 city/county school districts in Tennessee was included. Representatives of health-care operations included the 93 Tennessee members of the American Society of Hospital Food Service Administrators (ASHFSA) and the 129 members of the management practice group of the Tennessee Dietetic Association (TDA). Seventeen were members of both ASHFSA and TDA and, thus, were not included on the TDA mailing list. A random sample of

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**Table 1. Importance ratings of supervisors/managers for 55 job-related areas**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Importance Rating $b$ (M ± SD)</th>
<th>Important (%)</th>
<th>Very Important (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial management</td>
<td>2.7 ± 0.6</td>
<td>18</td>
<td>78</td>
</tr>
<tr>
<td>State/federal regulations</td>
<td>2.6 ± 0.6</td>
<td>22</td>
<td>78</td>
</tr>
<tr>
<td>Health and safety laws, inspection, and enforcement</td>
<td>2.6 ± 0.6</td>
<td>31</td>
<td>69</td>
</tr>
<tr>
<td>Personnel management</td>
<td>2.6 ± 0.6</td>
<td>20</td>
<td>79**</td>
</tr>
<tr>
<td>Menu planning and design</td>
<td>2.6 ± 0.7</td>
<td>13</td>
<td>81**</td>
</tr>
<tr>
<td>Sanitation inspection</td>
<td>2.6 ± 0.6</td>
<td>31</td>
<td>68</td>
</tr>
<tr>
<td>Employee motivation</td>
<td>2.6 ± 0.6</td>
<td>28</td>
<td>71*</td>
</tr>
<tr>
<td>Employee orientation and training</td>
<td>2.6 ± 0.7</td>
<td>22</td>
<td>74</td>
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<tr>
<td>Nutrition</td>
<td>2.5 ± 0.7</td>
<td>18</td>
<td>60***</td>
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<tr>
<td>Budgeting</td>
<td>2.5 ± 0.7</td>
<td>34</td>
<td>54</td>
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<tr>
<td>Developing standards for quality</td>
<td>2.5 ± 0.7</td>
<td>35</td>
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<tr>
<td>Developing quality control program</td>
<td>2.5 ± 0.7</td>
<td>46</td>
<td>46**</td>
</tr>
<tr>
<td>Food production/delivery</td>
<td>2.5 ± 0.7</td>
<td>41</td>
<td>57</td>
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<tr>
<td>Management development</td>
<td>2.5 ± 0.7</td>
<td>51</td>
<td>41*</td>
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<tr>
<td>Problem solving/decision making</td>
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<td>43</td>
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<tr>
<td>Implementing quality control program</td>
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<td>41</td>
<td>52**</td>
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<tr>
<td>Financial records</td>
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<tr>
<td>Labor-management relations</td>
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<tr>
<td>Laws affecting personnel utilization</td>
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<tr>
<td>Trends in food service</td>
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<tr>
<td>New products</td>
<td>2.4 ± 0.7</td>
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<td>47</td>
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<tr>
<td>Determining staffing needs</td>
<td>2.4 ± 0.8</td>
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<tr>
<td>Developing organizational goals</td>
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<td>Job descriptions and performance standards</td>
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<td>Equipment</td>
<td>2.3 ± 0.7</td>
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<tr>
<td>Monitoring service performance</td>
<td>2.3 ± 0.7</td>
<td>49</td>
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### Table 1: Continued

<table>
<thead>
<tr>
<th>Topic</th>
<th>Importance Rating(^b) (M ± SD)</th>
<th>Important (%)</th>
<th>Very Important (%)</th>
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</thead>
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<td>Professional staff development</td>
<td>2.3 ± 0.8</td>
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<td>50***</td>
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<tr>
<td>Work scheduling</td>
<td>2.3 ± 0.8</td>
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<td>54</td>
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<td>Leadership effectiveness</td>
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<td>46</td>
<td>37</td>
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<tr>
<td>Performance evaluation</td>
<td>2.3 ± 0.8</td>
<td>44</td>
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<tr>
<td>Marketing</td>
<td>2.3 ± 0.8</td>
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<td>40</td>
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<td>Resource allocation</td>
<td>2.3 ± 0.7</td>
<td>48</td>
<td>34</td>
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<td>Purchasing trends</td>
<td>2.3 ± 0.8</td>
<td>53</td>
<td>30</td>
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<tr>
<td>Employee recruitment and selection</td>
<td>2.2 ± 0.8</td>
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<td>41</td>
</tr>
<tr>
<td>Establishing service goals</td>
<td>2.2 ± 0.8</td>
<td>49</td>
<td>34</td>
</tr>
<tr>
<td>Environmental impact on food service</td>
<td>2.2 ± 0.8</td>
<td>45</td>
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<tr>
<td>Employee incentive and reward systems</td>
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<td>41</td>
</tr>
<tr>
<td>New equipment</td>
<td>2.1 ± 0.8</td>
<td>35</td>
<td>51</td>
</tr>
<tr>
<td>Equipment maintenance</td>
<td>2.1 ± 0.9</td>
<td>32</td>
<td>53***</td>
</tr>
<tr>
<td>Marketing products/services</td>
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<td>39</td>
<td>33</td>
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<td>Liability</td>
<td>2.1 ± 0.8</td>
<td>43</td>
<td>36</td>
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<tr>
<td>Layout and design</td>
<td>2.1 ± 0.9</td>
<td>41</td>
<td>43*</td>
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<td>Leadership styles</td>
<td>2.1 ± 0.8</td>
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<td>20</td>
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<tr>
<td>Space allocation</td>
<td>2.0 ± 0.9</td>
<td>49</td>
<td>41**</td>
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<td>2.0 ± 0.9</td>
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<tr>
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<td>2.0 ± 0.9</td>
<td>46</td>
<td>37*</td>
</tr>
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<td>Insurance</td>
<td>1.8 ± 0.9</td>
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<td>28**</td>
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<td>Food delivery systems</td>
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<td>12*</td>
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<td>1.0 ± 1.0</td>
<td>11</td>
<td>5*</td>
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<tr>
<td>Advertising</td>
<td>1.7 ± 1.0</td>
<td>30</td>
<td>14***</td>
</tr>
</tbody>
</table>

\(^a\)The sample consisted of 74 school city/country food service directors, 40 restaurant managers, and 103 health-care food service managers.

\(^b\)Four-point importance rating scale was used with the following anchors: 3 (very important), 2 (important), 1 (some importance), and 0 (not important).

\(^*\)significance level of chi-square \(p < 0.05\)

\(^**\)significance level of chi-square \(p < 0.01\)

\(^***\)significance level of chi-square \(p < 0.001\)

Half \((n = 217)\) of the members of the Tennessee Restaurant Association (TRA) were included.

**Data Collection.** The questionnaire, a cover letter explaining the purpose of the study and ensuring confidentiality, and a self-addressed, postage-paid return envelope were mailed to the food service managers in the study samples. A three-digit code was written on each questionnaire to identify nonrespondents for follow-up purposes. Three weeks following the initial mailing, a follow-up postcard was mailed to encourage response.

**Data Analysis.** The Statistical Analysis System (SAS) was used for all data analyses. Means and standard deviations and frequency distributions were calculated for importance ratings, continuing education needs ratings, and preference for methods of delivery for continuing education. Chi-square analyses were used to determine if supervisors/managers in different food service settings had different perceived importance or continuing education needs ratings. A significance level of 0.05 was used.

**RESULTS AND DISCUSSION**

The total response rate for the study was 37%. For school food service supervisors, 74 (50%) responded. Responses from the other three groups were: ASHFS, 49 (53%); TDA, 54 (42%); and TRA, 40 (18%).

**Importance Ratings.** The mean importance ratings, in descending order of importance, and the frequency distribution for the important and very important ratings for the 55 job-related areas are summarized in Table 1. Mean importance ratings are highest for areas such as financial management, state/federal regulations, personnel-related areas such as employee motivation and employee orientation and training, menu planning and design, and sanitation inspection. The percentage of school food service supervisors rating these areas as important or very important were 100% for state/federal regulations, 99% for personnel, 98% for food production and delivery, 96% for equipment and financial management, 94% for menu planning and design, 92% for management development, 94% for layout and design, 79% for marketing, 77% for environmental impact on food service, and 76% for microcomputer applications.
Chi-square analyses revealed significant differences in how food service supervisors/managers in school, hospital, nursing home, and restaurant settings rated the importance of 20 of the 55 items. School food service supervisors rated nutrition as more important than did supervisors in all other settings; restaurant managers rated nutrition as less important than did managers in all other settings. School food service managers rated the importance of commissaries and developing quality control programs as less important than did managers in all other settings. Implementing quality control programs was rated less important by managers in schools and nursing homes than by managers in hospitals and restaurants. Equipment maintenance was rated lowest by hospital food service managers. The areas of layout and design/facility design and space allocation were deemed more important by managers in schools and nursing homes than for those in hospitals and restaurants. Managers in restaurants rated tax laws, insurance, marketing, and advertising as more important than did managers in all other settings. Conducting feasibility studies was most important in hospital settings. Menu planning and design was rated more important by managers in restaurants and hospitals. Personnel and labor-management relations were rated as more important and employee motivation, management development, and leadership styles as less important by managers in the nursing home setting compared to managers in the other settings. Professional staff development was rated higher in importance by school and hospital managers than by nursing home and restaurant managers.

**Continuing Education Needs.** The mean ratings for continuing education needs for supervisors/managers in all settings and the frequency distribution for areas identified as moderate or high need for supervisors in school districts are presented in Table 2. Differences in continuing education needs among the groups were significant for 15 of the 55 areas. For school food service supervisors, continuing education needs in microcomputer applications, equipment maintenance, personnel, and professional staff development were greater than were continuing education needs in those areas for other groups of managers.

For restaurant managers, continuing education needs were rated highest for tax laws, insurance, marketing products/services, advertising, labor-management relations, commissaries, and establishing service goals. For monitoring service performance, managers in restaurants and hospitals rated continuing education needs higher than did managers in schools and nursing homes. Marketing and conducting feasibility studies were rated higher for managers in hospitals than for managers in all other settings. Continuing education related to food delivery systems was most needed by nursing home managers and least needed by managers in school food service.

Table 2 summarizes the percentage of school food service supervisors that perceived a moderate or high need for training in the 55 areas. The area of personnel management received the highest percentage (57%) of supervisors rating it as a high-need area, followed by microcomputer applications (56%), employee orientation and training (54%), and menu planning and design (52%). Other areas that a high percentage of supervisors in schools also rated as important or very important include personnel management (99%), employee orientation and training (96%), menu planning and design (94%), and microcomputer applications (70%). Thus, these are areas for which continuing education programs should be planned.

**Continuing Education Methods.** Respondents were asked to rank order six methods of delivery for continuing education, with one being the most preferred method and six being the least preferred. The mean scores for rankings for the methods were: semi-

<table>
<thead>
<tr>
<th>Topic</th>
<th>Continuing Education Needs (M ± SD)</th>
<th>Moderate Need (%)</th>
<th>High Need (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee motivation</td>
<td>2.3 ± 0.7</td>
<td>45</td>
<td>49</td>
</tr>
<tr>
<td>Developing standards for quality</td>
<td>2.3 ± 0.7</td>
<td>46</td>
<td>43</td>
</tr>
<tr>
<td>Developing quality control program</td>
<td>2.3 ± 0.7</td>
<td>56</td>
<td>33</td>
</tr>
<tr>
<td>Implementing quality control program</td>
<td>2.3 ± 0.7</td>
<td>55</td>
<td>34</td>
</tr>
<tr>
<td>Financial management</td>
<td>2.3 ± 0.8</td>
<td>41</td>
<td>43</td>
</tr>
<tr>
<td>State/federal regulations</td>
<td>2.3 ± 0.8</td>
<td>46</td>
<td>44</td>
</tr>
<tr>
<td>Employee orientation and training</td>
<td>2.3 ± 0.8</td>
<td>37</td>
<td>54</td>
</tr>
<tr>
<td>Personnel management</td>
<td>2.3 ± 0.8</td>
<td>39 **</td>
<td>57 **</td>
</tr>
<tr>
<td>Management development</td>
<td>2.2 ± 0.8</td>
<td>48</td>
<td>34</td>
</tr>
<tr>
<td>Health and safety laws, inspection, and enforcement</td>
<td>2.2 ± 0.8</td>
<td>51</td>
<td>38</td>
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<tr>
<td>Problem solving/decision making</td>
<td>2.2 ± 0.8</td>
<td>50</td>
<td>30</td>
</tr>
<tr>
<td>Trends in food service</td>
<td>2.2 ± 0.8</td>
<td>43</td>
<td>38</td>
</tr>
<tr>
<td>Microcomputer applications</td>
<td>2.2 ± 0.9</td>
<td>38</td>
<td>56 *</td>
</tr>
<tr>
<td>Financial records</td>
<td>2.1 ± 0.8</td>
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<tr>
<td>Marketing</td>
<td>2.1 ± 0.8</td>
<td>60 **</td>
<td>18 ***</td>
</tr>
<tr>
<td>Developing organizational goals</td>
<td>2.1 ± 0.8</td>
<td>48</td>
<td>27</td>
</tr>
<tr>
<td>New equipment</td>
<td>2.1 ± 0.8</td>
<td>46</td>
<td>40</td>
</tr>
<tr>
<td>Labor-management relations</td>
<td>2.1 ± 0.8</td>
<td>43</td>
<td>41 **</td>
</tr>
<tr>
<td>Laws affecting personnel utilization</td>
<td>2.1 ± 0.8</td>
<td>42</td>
<td>39</td>
</tr>
<tr>
<td>Equipment</td>
<td>2.1 ± 0.8</td>
<td>61</td>
<td>29</td>
</tr>
<tr>
<td>Budgeting</td>
<td>2.1 ± 0.8</td>
<td>47</td>
<td>32</td>
</tr>
</tbody>
</table>

*Continued on next page
Table 2. Continued

<table>
<thead>
<tr>
<th>Topic</th>
<th>Continuing Education Needs (M ± SD)</th>
<th>Moderate Need (%)</th>
<th>High Need (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional staff development</td>
<td>2.1 ± 0.8</td>
<td>46</td>
<td>40 **</td>
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<tr>
<td>New products</td>
<td>2.1 ± 0.9</td>
<td>52</td>
<td>34</td>
</tr>
<tr>
<td>Determining staffing needs</td>
<td>2.1 ± 0.9</td>
<td>32</td>
<td>45</td>
</tr>
<tr>
<td>Menu planning and design</td>
<td>2.1 ± 0.9</td>
<td>31</td>
<td>52</td>
</tr>
<tr>
<td>Sanitation inspection</td>
<td>2.1 ± 0.9</td>
<td>46</td>
<td>37</td>
</tr>
<tr>
<td>Establishing service goals</td>
<td>2.0 ± 0.8</td>
<td>49</td>
<td>21           *</td>
</tr>
<tr>
<td>Environmental impact on food service</td>
<td>2.0 ± 0.8</td>
<td>50</td>
<td>24</td>
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<tr>
<td>Performance evaluation</td>
<td>2.0 ± 0.8</td>
<td>49</td>
<td>36</td>
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<tr>
<td>Resource allocation</td>
<td>2.0 ± 0.8</td>
<td>54</td>
<td>17</td>
</tr>
<tr>
<td>Purchasing trends</td>
<td>2.0 ± 0.9</td>
<td>53</td>
<td>22</td>
</tr>
<tr>
<td>Monitoring service performance</td>
<td>2.0 ± 0.8</td>
<td>47</td>
<td>25           *</td>
</tr>
<tr>
<td>Nutrition</td>
<td>2.0 ± 0.9</td>
<td>38</td>
<td>47</td>
</tr>
<tr>
<td>Food production/delivery</td>
<td>2.0 ± 0.9</td>
<td>54</td>
<td>30</td>
</tr>
<tr>
<td>Job descriptions and performance standards</td>
<td>2.0 ± 0.9</td>
<td>46</td>
<td>34</td>
</tr>
<tr>
<td>Leadership effectiveness</td>
<td>2.0 ± 0.9</td>
<td>44</td>
<td>31</td>
</tr>
<tr>
<td>Employee incentive and reward systems</td>
<td>2.0 ± 0.9</td>
<td>43</td>
<td>31</td>
</tr>
<tr>
<td>Equipment maintenance</td>
<td>2.0 ± 0.9</td>
<td>44</td>
<td>45 **</td>
</tr>
<tr>
<td>Work scheduling</td>
<td>1.9 ± 1.0</td>
<td>41</td>
<td>40</td>
</tr>
<tr>
<td>Employee recruitment and selection</td>
<td>1.9 ± 1.0</td>
<td>52</td>
<td>22</td>
</tr>
<tr>
<td>Research in food service</td>
<td>1.9 ± 0.9</td>
<td>34</td>
<td>33</td>
</tr>
<tr>
<td>Marketing products/services</td>
<td>1.9 ± 0.9</td>
<td>59</td>
<td>15           *</td>
</tr>
<tr>
<td>Liability</td>
<td>1.8 ± 0.9</td>
<td>43</td>
<td>25</td>
</tr>
<tr>
<td>Layout and design</td>
<td>1.8 ± 0.9</td>
<td>51</td>
<td>25</td>
</tr>
<tr>
<td>Leadership styles</td>
<td>1.8 ± 0.9</td>
<td>45</td>
<td>18</td>
</tr>
<tr>
<td>Space allocation</td>
<td>1.8 ± 0.9</td>
<td>52</td>
<td>25</td>
</tr>
<tr>
<td>Facility design</td>
<td>1.8 ± 0.9</td>
<td>55</td>
<td>23</td>
</tr>
<tr>
<td>Food delivery systems</td>
<td>1.6 ± 1.0</td>
<td>25</td>
<td>8 **</td>
</tr>
<tr>
<td>Nontraditional food production systems</td>
<td>1.6 ± 0.9</td>
<td>33</td>
<td>18</td>
</tr>
<tr>
<td>Conducting feasibility studies</td>
<td>1.6 ± 0.9</td>
<td>33</td>
<td>7 **</td>
</tr>
<tr>
<td>Advertising</td>
<td>1.6 ± 0.9</td>
<td>33</td>
<td>9 ***</td>
</tr>
<tr>
<td>Equal opportunity and affirmative action</td>
<td>1.5 ± 0.8</td>
<td>35</td>
<td>14</td>
</tr>
<tr>
<td>Insurance</td>
<td>1.5 ± 1.0</td>
<td>32</td>
<td>15 **</td>
</tr>
<tr>
<td>Tax laws</td>
<td>1.4 ± 1.0</td>
<td>30</td>
<td>14 ***</td>
</tr>
<tr>
<td>Commissaries</td>
<td>1.0 ± 1.0</td>
<td>10</td>
<td>3 ***</td>
</tr>
</tbody>
</table>

a The sample consisted of 74 school city/country food service directors, 40 restaurant managers and 103 health-care food service managers.

b Four-point rating scale was used for continuing education needs with the following anchors: 3 (high need), 2 (moderate need), 1 (low need), and 0 (no need).

*significance level of chi-square p > 0.05

**significance level of chi-square p > 0.01

***significance level of chi-square p > 0.001

Current Research

nar at a nearby college or university, 2.0 ± 1.3; video-tape, 3.0 ± 1.3; teleconference, 3.8 ± 1.6; self-paced learning packet, 3.8 ± 1.6; article in magazine or journal, 3.9 ± 1.7; and seminar at University of Tennessee, Knoxville, 3.9 ± 1.9. Time required to reach the site and distance were the two factors that most influenced respondents' selection of methods for delivery of continuing education programs. There were no differences based on employment setting.

When asked what were preferred times for continuing education programs, daytime was overwhelmingly indicated. Summer months were most preferred, weekends were least preferred. Thus, for school food service supervisors, continuing education programs planned for daytime during summer months, a slower time of the year, may result in the best participation.

APPLICATION

Results of this study have application for individuals and groups planning and presenting continuing education programs for food service supervisors/managers. For many areas, perceived continuing education needs do not differ for supervisors/managers in school, health-care, and restaurant settings. For universities and commercial vendors of continuing education, these areas would have broad appeal and would attract a larger audience than training programs specific to individuals in one setting.

For organizations such as ASFSFA, state school food service associations, or the National Food Service Management Institute who are targeting educational programs for child nutrition program personnel, results of this study indicate priority areas for continuing education for school food service supervisors. Personnel management, for example, was identified as the highest need area for continuing education and, at the same time, 99% rated it as very important to effectively perform their job. In addition, Curtis and Messersmith (1986) found that personnel-related functions accounted for a significant time expenditure for unit-level managers. Canter (1988), however, identified few personnel-related competencies for supervisors in school food service. Based on this study, personnel management represents a training priority for supervi-
sors in school food service. Micro-computer applications, employee orientation and training, and menu planning and design are areas in which school food service supervisors identified a need for continuing education and were identified as important to their jobs.

Continuing education programs presented in a site close to supervisors' jobs will likely be most successful. Videotaped continuing education programs represent a promising delivery system for continuing education since they are convenient and use time efficiently.

REFERENCES


Comparison of Staff and Student Assessment of Quality and Preference for Menu Offerings

Erskine R. Smith, PhD, RD

Menu items that are acceptable to students must be offered if school food services are to provide meals that contribute significantly to meeting students' nutrient requirements. The purpose of this study was to compare ratings of school food service (SFS) personnel perceptions of students' preferences to actual student preferences for menu items. A survey instrument with a 5-point Likert-type scale was developed to ascertain SFS personnel and students' ratings for 99 breakfast and lunch menu items. A rating of 5 indicated strong preference, while a rating of 1 indicated little preference. The survey instrument was completed by 371 SFS employees and 812 students in grades 6, 8, and 10. Mean scores and scores within group rankings were analyzed. The SFS personnel mean ratings of students' preferences for menu items were significantly higher (p < 0.05) than students' ratings for each item. When the menu items were ranked for each food group by mean scores, however, the rankings of SFS personnel and the students were very similar. This suggests that SFS personnel may not be able to predict the degree to which students prefer food items but are able to predict students' relative preferences from among menu items.

The goals of the National School Lunch Program (NSLP) have expanded beyond merely meeting one-third of the daily nutrient requirements of school-age children to serving as a laboratory in which students can practice concepts presented in health and nutrition education programs (Frank, Vaden, & Martin, 1987). For a child to receive benefits of meals provided by the NSLP, he or she must eat the food. Administrators of school food service (SFS) programs are charged with the responsibilities of planning, purchasing, and serving foods that are nutritious and acceptable to children (American School Food Service Association [ASFSA], 1984; ASFSA, 1985; ASFSA, 1987).

SFS administrators must be aware of the needs and wants of their customers and should, when feasible, offer menu items and services that satisfy the customers, increase participation in the NSLP, and reduce plate waste. Individuals responsible for menu planning must consider student preferences, federal guidelines for the program, and ASFSA's goal of providing meals that meet the standards of the Dietary Guidelines for Americans (ASFSA, 1991). Balfitt, Duffy, and Sinha (1974) reported that knowledge of student preferences for menu items may be used to plan menus designed to increase acceptability and consumption of foods offered to heterogeneous populations. Hedonic scales may be used by SFS administrators to assess students' food preferences and acceptance of menu offerings (Head, Giesbrecht, & Johnson, 1977).

Erskine Smith is assistant professor in the School of Home Economics at the University of Southern Mississippi, Hattiesburg.
Eating habits and food preferences of Americans have changed over the past few decades (Anderson, 1991). The increased concern about the amount of sugar, salt, and fat in meals served in schools will continue as a national issue. SFS professionals must be aware of children's food preferences as they plan meals to meet the nutritional needs of children.

The purposes of this study were to obtain students' perceptions of quality attributes of the SFS program, ascertain students' preferences for menu items offered regularly in the school breakfast and lunch programs, and compare SFS staff perceptions of program quality and preferences for menu items with those of students.

**METHODOLOGY**

**Development of the Instrument.** Data were collected using two questionnaires developed for this study, one developed for students and one for the SFS staff. Each questionnaire featured two parts. Part 1 contained 18 questions related to perceptions of the food service operation and personal data about the participants. Part 2 was designed to solicit information related to preference for selected menu items offered by the school district. The investigator reviewed the nine-month menu plans for breakfast and lunch provided by the district SFS director to determine which items to include on the instrument. A menu item was included on the survey instrument if it appeared on the planned menus at least five times during the period.

Each questionnaire was pilot tested by a group of food service professionals, including a district director, unit managers, and university faculty who teach food service management. Questionnaires were evaluated by teachers of students who participated in the study for readability and clarity. Twelve students in the same grades as the sample population piloted tested the instrument. No changes were made in the instrument after the pilot test.

**Data Collection.** The investigator met with the SFS director and the assistant superintendent of the school district to discuss distribution of the instrument and accompanying computer response form. Data were collected during the last month of the school year from sixth, eighth, and tenth grade students and the SFS staff of a large urban school district. For the school year, the average daily participation rate was 74%. Seventy-three percent of the students in the district were eligible for free or reduced-priced meals.

The SFS director distributed the questionnaire and response form sheet to randomly selected sixth, eighth, and tenth grade homerooms throughout the district. Teachers were informed of the study by the assistant superintendent and instructed to have the instruments completed and returned to the SFS director's office by a specified date. Approximately 1,000 students were assigned to the homerooms selected to participate in the survey.

Questionnaires were distributed to the SFS staff by the unit managers. Approximately 400 SFS staff members, including central office personnel, were asked to complete the survey instrument.

A 5-point Likert-type rating scale was used to obtain student preference ratings for 99 menu items, with 5 indicating a very strong preference or liking for the item and 1 suggesting that the item was not preferred or a very strong dislike of the menu item. The SFS staff used the same scale to predict student preferences for the menu items. The menu items appearing on the questionnaire were divided into six groups: meats and main dishes, 34 items; vegetables, 24 items; fruits and fruit juices, 14 items; bread, cereals, and breakfast pastries, 15 items; milk, 4 items; and dessert, 8 items.

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). Frequency distributions were obtained for items included in Part 1 of the questionnaire. Mean ratings were obtained for student preference ratings and for staff's perceptions of students' preferences. Student t-tests were used to compare scores of the two groups. Correlation coefficients were determined for the staff's and students' rankings for the six food groups.

**RESULTS AND DISCUSSION**

Due to absences, tardiness, and other reasons, the instrument was distributed to 857 students and 371 SFS employees. All instruments that were distributed were completed and returned.

The number of students who completed the instrument decreased as the grade level increased (Table 1). High school students represented less than 30% of the returned instruments. More females than males completed the instrument. Collectively, black and white students accounted for 93% of all respondents. This percentage is typical of the school district. The number of students who reported eating school lunch three to five times a week was 3.5 times greater than those who reported eating school breakfast three to five times a week.

The typical SFS employee in this school district was female and black. More than 64% of the staff respondents had at least five years of work experience in SFS. The managerial and supervisory personnel accounted for about 16% of the staff respondents.

**Perceptions of Quality of School Food Service.** The SFS staff and the students had different opinions about the quality of the SFS operation. A disparity existed between the percent of staff who reported that the food was good or most of the time and the students' assessment of this attribute (Table 2). More than 90% of SFS staff believed that the food was good all or most of the time while only 25% of the students believed that the food was good all or most of the time.

More than half of the staff believed that students liked the breakfast and lunch most of the time. Less than 2% of the staff indicated that students often did not like either breakfast or lunch. When asked to indicate their ratings of breakfast, fewer than 10% of the students indicated that they liked breakfast most of the time and about 21% liked lunch most of the time. Twenty-eight percent of the students indicated that they did not like breakfast while 19% indicated that they did not like lunch. The findings regarding students' ratings of lunch are not consistent with those reported by Garrett and Vaden (1978), who found that students who ate school lunch three or more times per week did so because they liked the food. More than 76% of the students reported that they ate school lunch three or more times per week. Seventy-three percent of the students in the district were eligible for free or reduced-price meals. Thus, some of the respondents may participate in school lunch out of necessity rather than desire.

Another attribute related to food
quality—the temperatures at which foods were served—also received conflicting ratings from the two groups. More than 90% of the staff believed that foods were served at the right temperatures all or most of the time compared to slightly more than half of the students. Possible explanations for this disparity may be related to the length of time food is held during service or differences in the temperature when put on the plate and temperature when students actually start eating. Prolonged holding time may affect the quality of the product and acceptability of the food by students (Johnson, 1983; Devan, Gregoire, & Spears, 1988).

Students and SPS staff differed in their opinions about the size of the servings. Staff tended to believe that portion sizes were about right while two out of three students indicated that they thought the portion sizes were too small. The students tended to rate the portion sizes as too small as their grade level increased. Only 57.9% of the sixth graders indicated that portions were too small compared to 70.1 and 74.8% of the eighth and tenth graders, respectively. There are a number of possibilities as to why students rated the portion sizes as too small. One possibility for this rating is that for a number of students, school lunch is the first meal of the day. Thirty-six percent of the students indicated that they did not eat breakfast at school, at home, or on the way to school.

Students tended to agree with the staff about the cleanliness of the dining rooms and friendliness of the food service staff. Seventy-two percent of the students reported that the staff was friendly all or most of the time. Garrett and Vaden (1978) reported that children who received free or reduced-price meals tended to believe that food service employees are friendly. In the study being reported, when SPS members were asked to assess students’ friendliness toward the staff, 96% reported that students were friendly all or most of the time.

### Table 1. Personal characteristics of students and school food service staff

<table>
<thead>
<tr>
<th></th>
<th>Number of Respondents</th>
<th>Percentage&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Students</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade (N = 812)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td>311</td>
<td>38.2</td>
</tr>
<tr>
<td>8th</td>
<td>262</td>
<td>32.3</td>
</tr>
<tr>
<td>10th</td>
<td>239</td>
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<tr>
<td>Sex (N = 837)</td>
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<td></td>
</tr>
<tr>
<td>Female</td>
<td>443</td>
<td>52.9</td>
</tr>
<tr>
<td>Male</td>
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<td>Race (N = 847)</td>
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<tr>
<td>Black</td>
<td>568</td>
<td>67.1</td>
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<tr>
<td>White</td>
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<td>25.9</td>
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<tr>
<td>Native American</td>
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<td>5.2</td>
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<td>Asian</td>
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<td>1.1</td>
</tr>
<tr>
<td>Hispanic</td>
<td>6</td>
<td>0.7</td>
</tr>
<tr>
<td>Participation in school breakfast (N = 854)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-5 times/week</td>
<td>187</td>
<td>21.9</td>
</tr>
<tr>
<td>1-2 times/week</td>
<td>106</td>
<td>12.4</td>
</tr>
<tr>
<td>Do not participate</td>
<td>561</td>
<td>65.7</td>
</tr>
<tr>
<td>Participation in school lunch (N = 854)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-5 times/week</td>
<td>653</td>
<td>76.5</td>
</tr>
<tr>
<td>1-2 times/week</td>
<td>92</td>
<td>10.8</td>
</tr>
<tr>
<td>Do not participate</td>
<td>109</td>
<td>12.7</td>
</tr>
<tr>
<td><strong>Staff</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex (N = 350)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>316</td>
<td>90.3</td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
<td>9.7</td>
</tr>
<tr>
<td>Race (N = 355)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>311</td>
<td>87.6</td>
</tr>
<tr>
<td>White</td>
<td>35</td>
<td>9.9</td>
</tr>
<tr>
<td>Native American</td>
<td>8</td>
<td>2.3</td>
</tr>
<tr>
<td>Hispanic</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Asian</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Experience (N = 347)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>31</td>
<td>8.9</td>
</tr>
<tr>
<td>1-3 years</td>
<td>38</td>
<td>11.0</td>
</tr>
<tr>
<td>3-5 years</td>
<td>55</td>
<td>15.9</td>
</tr>
<tr>
<td>5-10 years</td>
<td>94</td>
<td>27.1</td>
</tr>
<tr>
<td>10 years or more</td>
<td>129</td>
<td>37.2</td>
</tr>
<tr>
<td>Position (N = 346)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General assistant</td>
<td>127</td>
<td>36.5</td>
</tr>
<tr>
<td>Technical assistant</td>
<td>166</td>
<td>47.7</td>
</tr>
<tr>
<td>Manager</td>
<td>47</td>
<td>13.5</td>
</tr>
<tr>
<td>Supervisor/director</td>
<td>8</td>
<td>2.3</td>
</tr>
</tbody>
</table>

<sup>a</sup>Based on the number of persons responding to each item
Table 2. Comparison of school food service staff and students' assessments of selected food service quality attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>SFS Staff (N = 371)</th>
<th>Students (N = 857)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Food served is:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good all of the time</td>
<td>42.7</td>
<td>3.8</td>
</tr>
<tr>
<td>Good most of the time</td>
<td>51.0</td>
<td>21.7</td>
</tr>
<tr>
<td>Fair most of the time</td>
<td>5.1</td>
<td>49.7</td>
</tr>
<tr>
<td>Not good most of the time</td>
<td>1.1</td>
<td>24.8</td>
</tr>
<tr>
<td><strong>Breakfast is:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good most of the time</td>
<td>52.0</td>
<td>21.2</td>
</tr>
<tr>
<td>Good some of the time</td>
<td>46.0</td>
<td>50.6</td>
</tr>
<tr>
<td>Not good often</td>
<td>2.0</td>
<td>23.2</td>
</tr>
<tr>
<td><strong>Lunch is:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good most of the time</td>
<td>57.1</td>
<td>24.2</td>
</tr>
<tr>
<td>Good some of the time</td>
<td>41.0</td>
<td>56.4</td>
</tr>
<tr>
<td>Not good often</td>
<td>1.9</td>
<td>19.4</td>
</tr>
<tr>
<td><strong>Food is served at the right temperature:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, most of the time</td>
<td>94.9</td>
<td>47.4</td>
</tr>
<tr>
<td>No, most of the time</td>
<td>5.1</td>
<td>52.6</td>
</tr>
<tr>
<td><strong>Serving size is:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Too large</td>
<td>6.3</td>
<td>2.9</td>
</tr>
<tr>
<td>About right</td>
<td>88.0</td>
<td>30.9</td>
</tr>
<tr>
<td>Too small</td>
<td>5.7</td>
<td>66.2</td>
</tr>
<tr>
<td><strong>Cafeteria is clean:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All of the time</td>
<td>49.9</td>
<td>22.7</td>
</tr>
<tr>
<td>Most of the time</td>
<td>47.3</td>
<td>42.6</td>
</tr>
<tr>
<td>Some of the time</td>
<td>2.8</td>
<td>34.7</td>
</tr>
<tr>
<td><strong>Cafeteria people are:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always friendly</td>
<td></td>
<td>43.4</td>
</tr>
<tr>
<td>Mostly friendly</td>
<td></td>
<td>28.6</td>
</tr>
<tr>
<td>Neither friendly nor unfriendly</td>
<td></td>
<td>18.1</td>
</tr>
<tr>
<td>Mostly unfriendly</td>
<td></td>
<td>5.1</td>
</tr>
<tr>
<td>Always unfriendly</td>
<td></td>
<td>4.9</td>
</tr>
<tr>
<td><strong>I am:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always friendly</td>
<td>81.7</td>
<td></td>
</tr>
<tr>
<td>Mostly friendly</td>
<td>16.3</td>
<td></td>
</tr>
<tr>
<td>Neither friendly nor unfriendly</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>Mostly unfriendly</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Always unfriendly</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td><strong>Students are:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Always friendly</td>
<td>38.2</td>
<td></td>
</tr>
<tr>
<td>Mostly friendly</td>
<td>57.8</td>
<td></td>
</tr>
<tr>
<td>Neither friendly nor unfriendly</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Mostly unfriendly</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Always unfriendly</td>
<td>1.4</td>
<td></td>
</tr>
</tbody>
</table>

*aBased on the number of respondents to each item*

was one of the more preferred food groups, and both elementary and secondary students rated ice cream as the most preferred dessert item. For all three grade levels in this study ice cream received the highest score of the dessert items.

Fruits and fruit juices received the second highest mean score. The three most preferred items in this group were grapes, orange juice, and grape juice with mean scores of 3.75, 3.72, and 3.60, respectively. The least preferred food in this group was cranberry juice, which received a mean score of 2.33. Head, Giesbrecht, Johnson, and Weeks (1982) found that the least popular items in the fruit and fruit juice group were cranberry sauce, cranberry congealed salad, and cranberry apple relish.

The bread, cereal, and breakfast pastry group was rated as the third most popular group. One-third of the items in this group had mean scores of 3.50 or higher. Cinnamon rolls, glazed donuts, and honeybuns were the most preferred items in this group with mean scores of 3.94, 3.79, and 3.68, respectively. The least preferred item in the group was whole wheat toast, which had a mean preference rating of 2.69.

The fourth most preferred food group was meat and main dishes. Head, Giesbrecht, Johnson, and Weeks (1982c) reported that the entree group usually follows the milk, dessert, and bread groups in terms of student preference. The five most preferred items included two pizza items, two fried chicken items, and a cheeseburger. These findings are similar to those reported by Honson and Davis (1986).

For students in Portland, Oregon, pizza, chicken, cheeseburgers, and hamburgers were among the more popular lunch items. The tenth-grade students in the study being reported preferred cheeseburgers just slightly more than sausage pizza. Law, Lewis, Grant, and Bachemin (1972) found that 77.9% of tenth-grade students liked hamburgers while only 56% liked school pizza.

Unlike the findings reported by Head et al. (1982c), the milk group was not the most preferred food group. The milk group ranked fifth out of six. Chocolate milk was by far the most preferred form of milk with a mean score of 3.69, followed by whole milk with a mean score of 2.93, 2%- milk had a mean score of 2.26, and skim milk with a mean score of 2.02.
### Table 3. Comparison of food group preference scores

<table>
<thead>
<tr>
<th></th>
<th>Meats &amp; Main Dishes</th>
<th>Vegetables</th>
<th>Fruit &amp; Juice</th>
<th>Breakfast Pastry</th>
<th>Milk</th>
<th>Dessert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td>3.08</td>
<td>2.55</td>
<td>3.28</td>
<td>3.16</td>
<td>2.69</td>
<td>3.64</td>
</tr>
<tr>
<td>8th</td>
<td>3.32</td>
<td>2.71</td>
<td>3.42</td>
<td>3.37</td>
<td>2.73</td>
<td>3.87</td>
</tr>
<tr>
<td>10th</td>
<td>3.20</td>
<td>2.71</td>
<td>3.24</td>
<td>3.35</td>
<td>2.79</td>
<td>3.64</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>3.17</td>
<td>2.65</td>
<td>3.31</td>
<td>3.26</td>
<td>2.69</td>
<td>3.73</td>
</tr>
<tr>
<td>Male</td>
<td>3.24</td>
<td>2.65</td>
<td>3.32</td>
<td>3.33</td>
<td>2.77</td>
<td>3.71</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>3.26</td>
<td>2.63</td>
<td>3.41</td>
<td>3.28</td>
<td>2.71</td>
<td>3.81</td>
</tr>
<tr>
<td>White</td>
<td>3.24</td>
<td>2.71</td>
<td>3.12</td>
<td>3.36</td>
<td>2.84</td>
<td>3.55</td>
</tr>
<tr>
<td>Participation in school lunch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-5 times/week</td>
<td>3.26c</td>
<td>2.70c</td>
<td>3.37c</td>
<td>3.22</td>
<td>2.74</td>
<td>3.79c</td>
</tr>
<tr>
<td>0-2 times/week</td>
<td>2.92</td>
<td>2.47</td>
<td>3.10</td>
<td>3.13</td>
<td>2.67</td>
<td>2.46</td>
</tr>
<tr>
<td>Staff</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General assistant</td>
<td>3.87</td>
<td>3.52</td>
<td>3.89</td>
<td>3.98</td>
<td>3.47</td>
<td>4.31</td>
</tr>
<tr>
<td>Cook</td>
<td>3.96</td>
<td>3.58</td>
<td>3.89</td>
<td>3.98</td>
<td>3.61</td>
<td>4.29</td>
</tr>
<tr>
<td>Manager</td>
<td>4.01</td>
<td>3.61</td>
<td>3.96</td>
<td>4.15</td>
<td>3.59</td>
<td>4.39</td>
</tr>
<tr>
<td>Supervisor/director</td>
<td>3.78</td>
<td>3.61</td>
<td>3.87</td>
<td>3.97</td>
<td>3.56</td>
<td>4.31</td>
</tr>
<tr>
<td>Experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-3 years</td>
<td>3.92</td>
<td>3.46</td>
<td>3.94</td>
<td>3.97</td>
<td>3.51</td>
<td>4.35</td>
</tr>
<tr>
<td>3-5 years</td>
<td>3.89</td>
<td>3.57</td>
<td>3.85</td>
<td>4.03</td>
<td>3.48</td>
<td>4.26</td>
</tr>
<tr>
<td>Comparison of staff and students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All SFS staff</td>
<td>3.93d</td>
<td>3.56d</td>
<td>3.87d</td>
<td>4.06d</td>
<td>3.53d</td>
<td>4.29d</td>
</tr>
<tr>
<td>All students</td>
<td>3.18</td>
<td>2.65</td>
<td>3.30</td>
<td>3.28</td>
<td>2.72</td>
<td>3.70</td>
</tr>
</tbody>
</table>

The least preferred food group was vegetables. Students’ dislike of vegetables is well documented in the literature (Jansen & Harper, 1978; Lilly, Davis, Wilkening, & Shank, 1980; Head et al., 1982b; Stallings & McKibben, 1982). About 50% of the items, however, had mean scores of at least 3.00. Two of the seven items receiving mean scores of 3.00 or higher were buttered whole kernel corn and corn on the cob. Carrot-raisin salad was the least preferred food item in this group with a mean score of 1.69. These findings are consistent with literature reports. In a survey of tenth-grade students, Law et al. (1972) found that 78% of the students liked corn and only 23% liked carrot-raisin salad.

Boudreaux and Smith (1988) found a similar pattern in their study of a rural Mississippi school district. The most preferred food group in their study was the dessert group. The least preferred food groups were the vegetable and milk groups. Possible reasons for similarities of the findings in these two studies include the fact that in both school districts more than 70% of the students were eligible for free or reduced-price meals and more than 65% of the respondents in both studies were black.

A possible explanation for the differences of this study and the studies reported by Head et al. (1982a; 1982b;
1982c) may be due to the fact that blacks accounted for 19.6 to 24.1% of the samples. In an effort to determine if one group of students in this study caused the rating of any food group to be lower than previously reported in the literature, t-tests compared ratings of black students and white students and female and male students. Chi-square analysis was completed to see if the students’ grades had an influence on the mean scores for the six food groups. No significant differences were found based on race, gender, or grade level. Significant differences, however, were found between students who reported eating school lunch three to five times a week and those who ate school lunch less than three times a week. Students who ate school lunch at least three times a week had higher preference scores for meat and main dishes, vegetables, fruits and fruit juices, and desserts than those students who ate less than three times a week. This finding is consistent those reported by Garrett and Vaden (1978).

Comparison of Student and SFS Staff Preference Ratings. The SFS staff responses were divided into three groups based on experience. Staff members with less than three years experience formed one group; those with three to five years formed a second group, and those with five or more years were included in the third group. The staff was also divided according to position, including general assistant, cook, manager, and supervisor/director. Chi-square analysis did not show any significant differences in preference ratings based on either length of experience or position (Table 3).

The SFS staff’s estimations of student preferences for each food group were significantly higher than the students’ preference ratings. In fact, the staff rated each of the 99 menu items as 95% higher than the students did.

These findings suggest that the staff members are not reliable judges of student preferences for individual food items. However, when rank order correlation was applied to the rank order of the food group ratings of the staff and students, a correlation coefficient of 0.73 was obtained. The value represents a high degree of agreement between the two groups. This finding suggests that while SFS staff members overrate preferences, they are reliable judges of the relative preferences students place on food groups. When the Spearman rank order correlation was applied to foods ranked within food groups the degree of agreement between students and staff ranged from a low of 0.71 for breads, cereals, and breakfast pastries to a high of 1.00 for milk (Table 4). These values suggest a high degree of agreement between the two groups.

## Table 4. Comparison of school food service staff and students’ ranking of menu items by food groups

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Spearman Rank Order Correlation Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>1.00</td>
</tr>
<tr>
<td>Desserts</td>
<td>0.92</td>
</tr>
<tr>
<td>Vegetables</td>
<td>0.89</td>
</tr>
<tr>
<td>Fruits &amp; fruit juices</td>
<td>0.80</td>
</tr>
<tr>
<td>Meats &amp; main dishes</td>
<td>0.73</td>
</tr>
<tr>
<td>Breads, cereals, &amp; breakfast pastries</td>
<td>0.71</td>
</tr>
</tbody>
</table>

APPLICATION

Findings of this study suggest that SFS staff and students do not agree on the quality of the food service or on student preferences for menu items. Input from students as well as SFS staff about the quality of the operation would benefit food service administrators as they attempt to operate an efficient and effective program. If menu planners are to succeed in offering menus that are acceptable to students and meet the guidelines of the NSLP and SBP, periodic surveys of student preferences and acceptance of menu items must be undertaken.

SFS staff’s perception of student preferences for menu items must not be dismissed. Although, SFS staff tend to overrate student preferences for individual food items, collectively, the SFS staff are reliable judges of students’ relative preferences among foods within groups. The SFS staff’s ability to assess the relative student preferences for foods within groups is not related to position or length of experience. Members of the SFS staff interact with students every day and have a good idea of what the students are eating. Food service administrators and individuals responsible for planning menus should take advantage of the knowledge that this group of valuable food service professionals possess.

## REFERENCES


Head, M.K., Giesbrecht, F.G., & Johnson, G.N. (1977). Food acceptability research: Comparative utility of three types of data from school chil-


High School Students' Attitudes Toward, and Participation in, the National School Lunch Program

Laura Fogleman, MS, RDE; Julianne Dutcher, MS, RD; Lucy McProud, PhD, RD; Ira Nelken, PhD; and Amy Lins, RD

Marketing research is an important consideration in developing and improving consumer products. Schools are the purveyors of one of the most ubiquitous products in the world: the school lunch. Limited research exists pertaining to the food and food service preferences of high school students. Three hundred ninety-four students from an ethnically diverse, urban area in northern California completed a questionnaire designed to assess their attitudes toward, and participation in, the National School Lunch Program. Attitudes and preferences were assessed using a 5-point scale, with 5 representing the highest rating. In general, students were most satisfied with the temperature of the cold foods (3.5 ± 1.1), and least satisfied with the time it takes to get the lunch (2.0 ± 1.2). The most frequently cited reasons for not purchasing the school lunch were taste of the food (53%), and time it takes to get the lunch (53%). Most nonparticipants obtained their lunch from home, but 36% of this group identified that they usually buy their lunch from school-operated vending machines or student club food sales. Improved taste of the school lunch was identified as the major factor that might stimulate the students to purchase the school lunch more often (3.9 ± 1.1). Additionally, peer influence would have the least amount of impact on their lunch purchases (2.0 ± 1.1). Perceived nutritional value of the school lunch was rated low (2.6 ± 1.0). A high degree of concern was noted regarding the freshness of the food (4.6 ± 0.9), although this study did not identify why the reasons for the concern. Regarding nutrients, students were most concerned over the amount of vitamins/minerals (3.7 ± 1.3) and fat (3.7 ± 1.4) in the school lunch. Most students did not view the school lunch as a charity program (1.5 ± 0.9). For students in the free or reduced-price category, being identified as "low income" was not a significant factor in their decision to eat the school lunch (2.0 ± 1.2), and they were not very concerned about other kids knowing that they received a free or reduced-price lunch (2.2 ± 1.3). The study demonstrated that if a price increase were imposed, paid students may stop or reduce the frequency of their school lunch purchases. This research points to the need to improve the delivery and quality of food services provided to students, implement marketing and nutrition education campaigns, and further investigate the food and food service preferences of high school students.

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Lucy McProud is professor and chair of the Department of Nutrition and Food Science at San Jose State University.

Ira Nelken is president of Ira Nelken & Associates, a research and evaluation consulting firm in Richmond, California.

Amy Lins is director of Food Services and Nutrition Education at San Jose Unified School District.
The National School Lunch Program (NSLP) was instituted in 1946 as a result of Public Law 396, which states: "It is hereby declared to be the policy of Congress, as a measure of national security, to safeguard the health and well-being of the nation's children and to encourage the domestic consumption of nutritious agricultural commodities and other foods" (Baehr, 1986). The NSLP is currently the largest feeding program in the world (American School Food Service Association [ASFSA], 1989). In 1980, more than 7.4 billion school lunches were served (Reiling, personal communication, March 1991).

Since the inception of the program in 1946, participation rates have fluctuated due to a variety of factors. Previous research indicates participation rates at the secondary level are lower than at the elementary level (West & Hoppe, 1973; Nicholson, 1973; United States Department of Agriculture [USDA], 1980; Maurer, 1984).

Maurer (1984), in an exhaustive study of 6,556 U.S. students, representing all ages and incomes, found participation rates in the NSLP significantly correlated with several variables: a la carte sales were not included in this study. Meal price and family income were identified as the most important variables determining participation—the higher the price, the more students discontinued participating in the lunch program, and the lower the family income, the higher the participation rate.

Nationally about 55% of students from the highest quartile for income (more than $30,000/yr.) participate in the lunch program, while the participation rate for students in the lowest quartile for income ($0-$12,250/yr.) is 79%. In addition, older students participate less than younger students with peak participation rates of 3.5 days per week at age 9, declining to 1.8 days per week at age 18. Males participate slightly more than females, rural students participate more than urban students, and the more educated the students' parents, the lower the student participation rate. Children whose parents identify nutrition as the primary consideration in deciding where the child gets lunch participate less often. Lastly, students whose parents felt the school lunch was a good buy, convenient, or more nutritious when compared with a home-prepared lunch, were more likely to participate in the lunch program.

Another study (Comptroller General, 1977) discovered that in schools with longer lunch periods (40 minutes), participation in the lunch program was higher than in schools with shorter lunch periods (23 minutes). Open campus policies, sale of competitive foods (vending machines), student stores and fundraisers, and competition from local fast food restaurants are additional factors that tend to decrease participation rates.

In 1980-81, the Omnibus Reconciliation Acts significantly reduced federal reimbursement rates to participating schools for all three categories of the National School Lunch Program: free, reduced-price, and full-price lunches (Peach, 1984). As a result of the 1980 and 1981 Omnibus Acts, national participation declined from 27 million students in 1979 to 23.1 million students in 1983, with the most significant drop found in the full-price lunch category, mainly due to increases in charges to students paying the full price for a school lunch. There was a 6.5% decline in the total national student enrollment between 1979 and 1983, but the decline in the NSLP participation during the same period was 8.7%. The evaluation of the impact of the 1981-82 Omnibus Acts indicates that reductions in lunch reimbursement rates, particularly full-price reimbursements, forced hundreds of thousands of schools to drop the NSLP or significantly increase the price of the full-price lunch, which decreases participation rates of 10% or more for every 10% price increase ("Chapter II," 1989).

Participation rates are lowest in the western states (Comptroller General, 1977). In 1989, California had an average daily participation rate of only 41% of the average daily attendance (B. McDonald, personal communication, March 20, 1991). In California the passage of Proposition 13, the Jarvis-Gann legislation, significantly reduced the funding available to schools because of the 1% taxation limit imposed upon property owners. This property tax limit reduced California tax dollars that would have, in part, been allocated to public schools (Mckinley, 1984). In addition, the "noisy meal over-ride tax" was eliminated. This local tax (California) provided millions of dollars to the school lunch program. As a result of these fiscal cuts some schools needed to increase the price of the school lunch, which may have contributed to lower participation rates in the full-price category.

Dr. Elinora Stewart, in an address to 1989 ASFSA Industry Seminar participants, defined marketing as "the anticipation and satisfaction of demand through the exchange process...Do research on what your customers want, and then show how your product meets those needs" (McLaren, 1989). Schools can borrow some of the marketing techniques used by food companies and restaurants to attract customers. One school district in Tucson, Arizona, experienced an 82% increase in total participation within one month by instituting a quick-serve snack line where students could get their favorite lunch items and, with careful menu planning, the items qualified for a federally reimbursable lunch (McLaren, 1989).

In a congressional review of school lunch operational improvements, several school districts were noted to respond to students' needs, which directly influenced participation rates. For example, just by changing the menu format (fast food type service vs. conventional) and offering a wider selection of food items, participation rates increased by a minimum of 32% and a maximum of 100% (Comptroller General, 1981).

Published literature is limited regarding the satisfaction level of students who participate in the NSLP. By identifying students' needs, attitudes, and buying behavior, more effective school lunch programs can be developed. The purpose of this research was to assess high school student satisfaction with, and attitudes toward, the school lunch program, and also to identify factors that might contribute to increased participation levels.

This study addressed four main questions:

1. What are the food and environmental factors related to high school students' decisions to purchase the school lunch?
2. Are high school students concerned with the nutritional quality of the school lunch?
3. Are students who receive a free or reduced-price lunch reluctant to participate in the lunch program because they are afraid they will be labeled "low income?"
4. What type of impact would a
$0.25 increase in the lunch price have on current participation rates for the school district under study?

METHODOLOGY

A questionnaire was used to collect the data and was written at the sixth-grade level to ensure understandability. A committee consisting of a statistician, reading specialists, teachers, food service director, assistant superintendent, and San Jose State University Nutrition and Food Science Department faculty guided the development of the questionnaire. The questionnaire was printed in English only and administered at all high school sites in the school district (seven schools).

Principals and teachers were contacted in advance and instructed in procedures for administering the questionnaire. Students received consent forms one week in advance for parents to sign and return. Because English was a required subject of all students, the questionnaires were distributed to English teachers to ensure ethnic representation. Teachers received written and verbal administration instructions (memos followed up by phone calls).

Instructions for completion were attached to each questionnaire. The students were instructed to raise their hand if they had a question and to not talk to their neighbors. In addition, they were informed that there were no right or wrong answers, that their participation was voluntary, and not to put their names on the questionnaire. The teachers allowed 30 minutes to complete the four-page questionnaire. Students who completed the questionnaire received a free food coupon, redeemable at the school cafeteria or snack bar.

The questionnaire addressed several issues. Satisfaction with various quality issues such as taste and appearance of food, temperature of food and milk, amount of time spent waiting in line for lunch, perceived value of the school lunch, number of menu choices, and cleanliness of the cafeteria were evaluated by the students. In addition, nonparticipants of the NSLP were asked why they do not eat the school lunch.

Attitude statements were used to identify students’ level of agreement with issues anticipated to be related to participation rates. Issues such as “wait in line,” perceived healthfulness of the lunch, menu choices, appearance and taste of the food, peer pressure, and student involvement in planning the school lunch were rated by students.

Students’ level of concern with various nutritional aspects of the school lunch was addressed. Many professionals question whether teenagers are concerned with the healthfulness of the food they eat (“Catch the Wellness,” 1991). This section of the questionnaire addressed many of the nutritional issues—such as cholesterol, fat, salt, etc.—highlighted in current media campaigns.

Students were asked to indicate any change in their participation that might occur if school lunch prices increased. Other issues the questionnaire addressed included interest in aesthetic improvements in the cafeteria and foods that students could eat while standing up. Lastly, the questionnaire addressed the issue of whether or not students enrolled in the free or reduced-price program participated in the NSLP less because of a perceived stigma attached to not having enough money to pay the full price for a lunch.

For the majority of questions, a rating scale was used to indicate the students’ level of agreement with an attitude statement or their level of concern with a quality or nutritional issue. The questionnaire’s format and rating scale were developed following published guidelines (Aday, 1989). The rating scale used consisted of a 1-to-5-point range with only the 1 and the 5 level being attached to descriptive statements. The level 5 indicates a high level of concern, agreement, or satisfaction, depending on the issue. The level 1 connotes a low level of concern, agreement, or satisfaction.

Neutral is assumed to be a 3 level. Interpretation of the results consisted of determining means and standard deviations.

Pilot Test. Prior to the pilot test, high school reading specialists reviewed the “readability” and wording of the questionnaire and made changes as needed. The questionnaire was pilot tested with one class (25 students) of ninth graders. Students were debriefed regarding the content of the survey. They were asked for their understanding of specific terms such as “school lunch” and “nutritious.” Students also evaluated the scales used, instructions, and flow of the questionnaire. Necessary changes were made prior to the main study.

RESULTS

Sample and Respondent Characteristics. The enrollment at the seven high school study sites totaled approximately 8,100 students. The average daily attendance was approximately 7,500 students. The sample obtained was 394, which was a representative sample size according to published guidelines (Issac & Michael, 1985). Out of 495 questionnaires distributed, 394 were returned, representing an 80% return rate. All seven high schools in the district returned questionnaires, however, at varying levels of participation.

Fifty percent of the respondents were female, 42% was male, and 8% did not indicate their gender. Respondents were fairly equally distributed by grade level, with the exception of the twelfth grade: 24% in the ninth grade, 19% in the tenth grade, 20% in the eleventh grade, and 35% in the twelfth grade. Paid students represented 79% of the respondents, 14% were free, 2% were reduced-price, 0.5% were in the cafeteria work program, and 4.5% did not indicate their category.

The ethnicity breakdown of the sample was similar to the overall high school breakdown, with the major ethnic groups (white, Hispanic, and Asian) well represented. The small differences that did exist may be due to the fact that 4% of the sample did not indicate their ethnicity. In addition, because of variation in individual teacher motivation, 69% of the questionnaires came from three of the seven schools, which could alter the breakdown depending on the ethnic composition of the individual schools. The survey was conducted in the last month of the school year, which may have affected some teachers’ ability to conduct the survey due to end-of-the-year responsibilities (e.g., final exams). The higher participation in the questionnaire by the twelfth graders may have been related to individual teacher motivation.

General Satisfaction with Selected Aspects of the School Lunch. The first section of the questionnaire evaluated students’ satisfaction with specific aspects of the school lunch program. The highest rating given was for the temperature of cold foods (3.3 ± 1.1).
Current Research

and the lowest rating given was for the length of time required to wait in line (2.0 ± 1.2); 50% of the students rated this item "very poor" (Table 1).

**Reasons Why Students Don’t Eat the School Lunch.** Students who don’t eat the school lunch were asked to identify the reasons for their nonparticipation in the school lunch program. The top three reasons given for not eating the school lunch were: time it takes to get the food (53%), taste of the food (53%), and not enough menu choices (29%). The results are summarized in Table 2.

As with adults, time appears to be a valuable commodity to adolescents. Students do not like waiting in lines, especially for food. In schools that have instituted "fast serve" lanes, participation has increased (McLaren, 1989). Mobile carts are popular with students, mainly because the lines are shorter. In addition, it may be that students don’t like going into the cafeteria to buy lunch, perhaps because of a particular social reason, such as you’re not with the "in" crowd if you get your lunch from the cafeteria. Further research in this area is warranted as it might have an impact upon school lunch program participation.

The taste of the food and additional menu choices also were very important to students. The use of Youth Advisory Councils to evaluate potential new food items is an effective way to ensure new product acceptance and promote the school lunch program (Sullivan & Shanklin, 1985).

As a follow-up to the reasons why they don’t buy the school lunch, students where asked to identify where they usually obtained their lunch (Table 3). The majority of students (62%) checked the response "from home," while 36% of the students bought their lunches from vending machines or student club food sales. This was a common practice, even in light of the federal/state competitive foods policy that states that the sale of foods in competition with the National School Lunch or Breakfast Program to children in the "food service area" is prohibited (California State Department of Education, 1985). Competitive foods is an ever-present problem. This practice encourages students to eat inadequate lunches and is in conflict with the goals of the school lunch program. However, due to shrinking school budgets, administrators encour-

### Table 1. Mean responses for satisfaction with selected aspects of the National School Lunch Program

<table>
<thead>
<tr>
<th>Item</th>
<th>N</th>
<th>M^A</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature of cold foods</td>
<td>386</td>
<td>3.5</td>
<td>1.1</td>
</tr>
<tr>
<td>Cleanliness of cafeteria</td>
<td>386</td>
<td>3.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Temperature of hot foods</td>
<td>389</td>
<td>3.2</td>
<td>1.1</td>
</tr>
<tr>
<td>Temperature of milk</td>
<td>386</td>
<td>3.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Number of menu choices offered</td>
<td>393</td>
<td>2.8</td>
<td>1.0</td>
</tr>
<tr>
<td>Taste of food</td>
<td>393</td>
<td>2.8</td>
<td>0.9</td>
</tr>
<tr>
<td>The amount of food for the price</td>
<td>387</td>
<td>2.7</td>
<td>1.1</td>
</tr>
<tr>
<td>Appearance of food</td>
<td>389</td>
<td>2.6</td>
<td>1.0</td>
</tr>
<tr>
<td>Wait in line to get lunch</td>
<td>391</td>
<td>2.0</td>
<td>1.2</td>
</tr>
</tbody>
</table>

^A Scale range is 1 to 5, with 5 representing "very good".

### Table 2. Reasons for nonparticipation in the National School Lunch Program

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage of Students Responding (N = 99)^A</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t like the taste of the food</td>
<td>53%</td>
</tr>
<tr>
<td>It takes too long to get the food</td>
<td>53%</td>
</tr>
<tr>
<td>Not enough menu choices</td>
<td>29%</td>
</tr>
<tr>
<td>The lunch doesn’t fill me up</td>
<td>23%</td>
</tr>
<tr>
<td>I don’t think the lunch is nutritious</td>
<td>21%</td>
</tr>
<tr>
<td>I don’t have classes after the lunch period, so I leave campus</td>
<td>12%</td>
</tr>
<tr>
<td>I don’t have enough money</td>
<td>11%</td>
</tr>
<tr>
<td>My friends don’t eat the school lunch, so I don’t either</td>
<td>9%</td>
</tr>
<tr>
<td>I don’t like the seating arrangement</td>
<td>6%</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
</tr>
</tbody>
</table>

^A Percentages do not add up to 100 because students could check more than one response.

### Table 3. Where nonparticipating students usually obtain lunch

<table>
<thead>
<tr>
<th>Place</th>
<th>Percentage of Students Responding (N = 99)^A</th>
</tr>
</thead>
<tbody>
<tr>
<td>From home</td>
<td>63%</td>
</tr>
<tr>
<td>School vending machines</td>
<td>25%</td>
</tr>
<tr>
<td>Student club food sales</td>
<td>11%</td>
</tr>
<tr>
<td>From a nearby restaurant (like McDonald’s)</td>
<td>7%</td>
</tr>
<tr>
<td>Local convenience store (like 7-11)</td>
<td>5%</td>
</tr>
<tr>
<td>A friend’s house</td>
<td>2%</td>
</tr>
<tr>
<td>Other</td>
<td>13%</td>
</tr>
</tbody>
</table>

^A Percentages do not add up to 100 because students could check more than one response.
age candy and soda-pop purchases because they probably support the school’s athletic or other programs (“Let the Competition,” 1990).

Students’ Attitudes Toward School Lunch-Related Statements. To determine the strength of students’ attitudes toward issues related to their participation (or nonparticipation) in the school lunch program, a rating scale (similar to the one previously described) accompanied each attitude statement (Table 4). Attitudes regarding purchase behavior given specific changes in the lunch program were assessed. In addition, any associations of the school lunch as being a “charity” program were identified. Lastly, the perceived overall nutritional quality of the school lunch was assessed.

Students indicated that the top two factors that would cause them to purchase the lunch more often were improved taste of the food (3.9 ± 1.1) and more menu choices (3.7 ± 1.2). The factors that would have the least amount of impact on students’ decision to purchase the lunch more often were if their peers bought the lunch (2.0 ± 1.1) and an improved cafeteria seating arrangement (2.3 ± 1.2).

To evaluate whether or not students (purchased, free and reduced-price) identified the school lunch as a charity program, the statement: “the school lunch is only for poor kids” was posed. Students overwhelmingly disagreed with this statement (1.5 ± 0.9). In addition, free and reduced-price students were asked to rate the following statements: “I don’t like other kids knowing that I get a free or reduced-price lunch,” and “Sometimes I don’t eat the school lunch because I’m afraid other kids will think my family doesn’t have very much money.” The mean responses to these questions were 2.2 ± 1.3 and 2.0 ± 1.2, respectively.

The results from this study indicate that being identified as “low income” was not a factor in students’ decisions to eat the school lunch, and that they were not concerned about other kids knowing that they received a free or reduced-price lunch. However, it would be prudent to investigate this concept further with a larger sample of free and reduced-price students—this study sample was weighted toward full-price students.

In general, students expressed some disagreement with the statement: “I feel the school lunch is nutritious” (2.6 ± 1.0). Students also felt that their parents had similar perceptions about the nutritional value of the school lunch.

Student Concerns Regarding School Lunch. By far the most significant issue of concern was the freshness of the food (Table 5). Eighty-one percent of the students were “very concerned” about this issue (4.6 ± 0.9). Further investigation of this issue may be needed to determine basis for the concern. For example, do students think the food is of poor quality, or would they prefer items made from scratch, as opposed to the increased use of pre-made items?

Students were asked to identify their level of concern with nutritional aspects of the school lunch (Table 5). The amount of fat (3.7 ± 1.4), vitamins and minerals (3.7 ± 1.3), and cholesterol (3.6 ± 1.3) were the most issues of concern.

Table 4. Student attitudes toward school lunch

<table>
<thead>
<tr>
<th>Statements</th>
<th>N</th>
<th>M^a</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the food tasted better, I would buy the school lunch more often</td>
<td>394</td>
<td>3.9</td>
<td>1.1</td>
</tr>
<tr>
<td>If there were more menu choices, I would buy the school lunch more often</td>
<td>391</td>
<td>3.7</td>
<td>1.2</td>
</tr>
<tr>
<td>If I could help plan the menus, I would buy the school lunch more often</td>
<td>390</td>
<td>3.4</td>
<td>1.4</td>
</tr>
<tr>
<td>If the lunch line were shorter, I would buy the school lunch more often</td>
<td>394</td>
<td>3.4</td>
<td>1.5</td>
</tr>
<tr>
<td>If the lunch period were longer, I would buy the school lunch more often</td>
<td>391</td>
<td>3.3</td>
<td>1.4</td>
</tr>
<tr>
<td>If the food looked better, I would buy the school lunch more often</td>
<td>390</td>
<td>3.3</td>
<td>1.2</td>
</tr>
<tr>
<td>I feel the school lunch is nutritious (healthful)</td>
<td>394</td>
<td>2.6</td>
<td>1.0</td>
</tr>
<tr>
<td>My parents feel the school lunch is nutritious (healthful)</td>
<td>390</td>
<td>2.6</td>
<td>1.0</td>
</tr>
<tr>
<td>If the seating arrangement were improved, I would buy the school lunch more often</td>
<td>390</td>
<td>2.3</td>
<td>1.2</td>
</tr>
<tr>
<td>If more of my friends bought the school lunch, I would buy it too</td>
<td>393</td>
<td>2.0</td>
<td>1.1</td>
</tr>
<tr>
<td>The school lunch is only for poor kids</td>
<td>394</td>
<td>1.5</td>
<td>0.9</td>
</tr>
</tbody>
</table>

^aScale range is 1 to 5, with 5 representing “strongly agree”

Table 5. Student concerns for aspects of school lunch

<table>
<thead>
<tr>
<th>Concern</th>
<th>N</th>
<th>M^a</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshness of the food</td>
<td>393</td>
<td>4.6</td>
<td>0.9</td>
</tr>
<tr>
<td>Amount of vitamins/minerals</td>
<td>392</td>
<td>3.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Amount of fat</td>
<td>394</td>
<td>3.7</td>
<td>1.4</td>
</tr>
<tr>
<td>Amount of cholesterol</td>
<td>394</td>
<td>3.6</td>
<td>1.4</td>
</tr>
<tr>
<td>Amount of preservatives/additives</td>
<td>391</td>
<td>3.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Number of calories</td>
<td>394</td>
<td>3.5</td>
<td>1.4</td>
</tr>
<tr>
<td>Amount of salt</td>
<td>394</td>
<td>3.4</td>
<td>1.4</td>
</tr>
</tbody>
</table>

^aScale range is 1 to 5, with 5 representing “very concerned”
Current Research

±1.4) were the nutrients about which students expressed the most concern. Possibly these concerns are a reflection of their parents’ views, which has previously been identified as a reason for nonparticipation in the school lunch program (Maurer, 1984), or teachers may be influencing students’ attitudes toward the school lunch. This effect has been observed among students in the higher elementary grades (Perkins, Roach, & Valden, 1980).

In addition, the level of concern over the vitamin and mineral content of the school lunch was equal to the concern over the fat content. One reason for this concern may be the excessive advertising of vitamins and minerals, from soda, and elements to cereal boxes. Incorporating nutrition education into the school lunch program might help to dispel nutrition myths, while at the same time might increase participation rates. Jensen, Ferris, Neafsey, and Gorham (1985) found that a nutrition education program in elementary schools increased participation in the lunch program by 17%. College students also have responded favorably to nutrition education programs implemented in the food service area (Kubena & Carson, 1988).

Price Changes. Students were asked how they would respond to a $0.25 price increase, making the lunch $1.75 instead of $1.50. The overall finding was that if a $0.25 price increase went into effect, 33 (15%) of the paid students indicated that they would stop buying the school lunch and 48 (25%) of the paid students indicated that they would reduce their frequency of buying the school lunch.

These results are consistent with the findings of Maurer (1984). This study demonstrated that if a $0.25 price increase were imposed, participation might be significantly reduced. The perceived value of the school lunch may be a factor in the purchase decisions of students. For example, if they can get a hamburger, from soda, and french fries at a fast food restaurant for less than $1.75, they might feel that the school lunch doesn’t match their favorite fast food lunch in terms of value, so they may be reluctant to pay more for the school lunch.

Free and reduced-price students also indicated a price increase would significantly reduce their purchasing frequency. However, drawing conclusions from this information is difficult because free students would still get a free lunch and reduced-price students cannot be charged more than the current $0.40 if a price increase went into effect.

Other Issues. Students were asked to rate how they felt about foods that they could eat while standing up and improvements in the cafeteria environment. Foods that could be eaten while standing up was a popular idea with students (3.7 ± 1.3). Responses were slightly above neutral for interest in a “nice-looking cafeteria” (3.4 ± 1.3). These results suggest that it may be better to invest in mobile equipment, such as food carts, or speed-lines, rather than in expensive cafeteria renovation.

APPLICATION

Results of this research suggest that students care about the nutritional quality of the food they eat. They are exposed to nutrition-related advertising daily from television commercials, breakfast cereal boxes, etc.; they are a more aware population than, perhaps, children from a decade or two past. With the advances of food technology, convenience foods are of higher quality and better taste—children expect school food to mirror the timeliness, taste, freshness, and price of the fast food companies. School food service professionals will need to meet students’ increasingly sophisticated expectations in order to maximize the potential of the school lunch program. Practical recommendations based on the research findings are presented in Table 6.

The school lunch program is sometimes a target for criticism. By turning problems (high-fat lunch and a long lunch line), however, into possibilities (“light line,” lowfat food served in little time), criticism can turn to compliments and cash. Every student is a potential customer. By responding to students’ needs and concerns, school food service professionals can maximize participation.

Table 6. Recommendations for school food service personnel

1. Pretest new food items with student groups.
2. Serve more fresh foods and publicize their availability.
3. Offer more menu choices and involve students in menu planning.
4. Open more food windows at lunch or take lunch out to the students on mobile carts. Consider a staggered lunch hour.
5. Provide nutrition information for the students. Use the back of the menu to feature nutrition topics and information. Visit classes and sports teams to discuss what the body needs nutritionally.
6. Purchase food products that are lower in fat, and let the students know that they are lower in fat.
7. Negotiate with the school principals for the sale of competitive foods. Have a conference with the principals and teachers to discuss the nutritional impact on students of eating low nutrient dense foods from the school vending machines and student club or store food sales. Mention also the economic impact on your program of these kinds of competitive food sales. Align yourself with the principals’ goals (funding for school programs), but offer to help develop fundraising projects that are not in conflict with the goals of the school lunch program.
8. Seriously consider the necessity of a price increase. Increasing price without improving upon the items deemed important by the students is risky; revenues may suffer. If lunch lines and food quality were improved, participation may be higher—possibly enough to negate the necessity of a price increase.
9. Improving the cafeteria environment would be appreciated by students but may not increase revenues.
10. Provide additional training for cafeteria personnel in merchandising and cooking techniques.
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Development of a Wellness/Nutrition Education Program for Florida School Food Service Workers

Frank D. Rohter, PhD; Mary Ann Schmidt, MA; Carol Frazee, BS; Gerald R. Gergley, MS; and Stephanie Mullican Norris, RD

Florida school food service employees (488) participated in a three-phased wellness program. The awareness phase consisted of six regional workshops that featured degenerative disease, lower back disorders, and nutrition awareness presentations; the participants evaluated each presentation between “excellent” and “very good.” The assessment phase consisted of four physiologic measurements that showed: 30% of the participants had total cholesterol/high density lipoprotein (TC/HDL) ratios below 13% risk of coronary artery disease (CAD), 42% were between 13 and 25% risk, 25% were below 26 and 50% risk, and 3% were between 51 and 75% risk; 3% of the participants were at a low body fat percentage risk of CAD, 10% were average risk, 29% were high risk, and 58% were very high risk; 44% of the participants had normal systolic blood pressure, 17% were borderline hypertensive, and 1% were hypertensive; and 16% of the participants had normal diastolic blood pressure, 36% were high normal, 10% were mild hypertensive, and 6% were moderate hypertensive. The intervention phase showed that the participants evaluated their intervention experiences (1-mile walk, low-fat/high-energy lunch, stretching sessions, physiologic assessments, and wellness leadership manuals) between “excellent” and “very good.”

With the spiraling costs of corporate health care, predicted employee’s medical coverage will exceed salaries by the year 2000. (Karman, 1987; Frances, 1987). Since school food service workers constitute a significant segment of the school system’s corporate workforce, plans to control their soaring health insurance claims need consideration.

Major corporations such as Blue Cross, Equitable Life, Campbell’s Soup, Johnson and Johnson, and Coors have reported that health care costs can be reduced by controlling certain degenerative disease risk factors such as cholesterol profiles, body fat percentages, blood pressures, and lower back disorders (Herzlinger & Schwartz, 1985; Regin, 1987; Wilbur, 1983; Manuso, 1983; M.L. Morton, personal communication, April 1991). However, these studies have focused, for the most part, on the so-called “white collar” populations. No studies were found that have focused exclusively on “blue collar” populations.

Founded on this apparent need, a wellness program was developed for Florida school food service workers to lower their degenerative disease risk factors. The project was funded by the Florida State Department of
Education. The wellness program was designed and implemented to change the exercise and nutrition habits related to the risk factors associated with coronary artery disease (CAD) and the ergonomics related to lower back disorders—two of the major contributors to corporate health-care costs. This program consisted of three phases: awareness, assessment, and intervention.

METHODOLOGY

Awareness Phase. The awareness phase consisted of conducting a regional wellness workshop in each of the following Florida counties: Pinellas, Osceola, Flagler, Brevard, Polk, and Okaloosa. The invited participants were selected for their leadership abilities and their overt interest in wellness. Attendance at each of these regional workshops ranged between 80 and 100 participants, 98% of which were females. Each workshop featured three awareness presentations: a degenerative disease prevention presentation with coronary artery disease (CAD), hypertension, obesity, and osteoporosis and the lifestyle changes needed to inhibit degenerative progressions; a lower-back disorder prevention presentation that identified the postures and body mechanics that cause trauma to the lower back; and a nutrition presentation that identified low-fat, high-energy foods and strategies to reduce calorie intake.

Assessment Phase. The assessment phase consisted of a set of physiologic measurements that were taken at each of the regional workshops and included a cholesterol profile that entailed a total cholesterol/high density lipoprotein (TC/HDL) ratio, body fat percentage, and systolic and diastolic blood pressures.

Blood cholesterol measurements were made by a local biomedical laboratory. Body fat percentages were measured with a Lang caliper (Follock, Willmore, & Fox, 1984) and the sum of three sites and a formula (4.95/body density minus 4.5x100) devised by Siri (Bryne, 1991) were used to determine body fat percentage values. Blood pressures were taken by standard methods of auscultation and aneroid sphygmomanometry.

A team of local school food service worker volunteers were trained before each regional workshop to make the body fat percentage and blood pressure measurements. Their measurement skills were tested and were consistent with the performance criteria established by the training coordinator.

Results of these physiologic tests were confidential. Participants at each respective regional workshop received a copy of their test results and a formal slide presentation that interpreted these results and identified the nutrition and lifestyle changes needed to reduce existing risk factors. Raw scores for statistical analysis in this study were collected without references to subjects’ names.

Intervention Phase. The intervention phase consisted of three components. The first component incorporated a series of wellness intervention experiences devised to develop an appreciation for select wellness habits. These experiences included a 1-mile walk, a low-fat/high-energy lunch, and two sessions on stretching and flexibility exercises. These wellness intervention experiences were accompanied by a discourse on the physiologic and metabolic benefits accruing from these activities.

The second component consisted of a training manual that was distributed to each participant. The training manual included extensive and relevant information on nutrition, exercise and strategies to establish a cultural support system at the respective local school work sites.

The third component included the physiologic measurements that were taken of each participant. These intervention experiences encouraged participants to continue these assessment skills and to promote them to their coworkers. Thus, the physiologic measurement sessions served both the assessment and intervention phase of this program.

RESULTS AND DISCUSSION

Awareness. Participants rated the quality of the assessment programs using a 5-point scale ranging from 1, poor, to 5, excellent. Ratings by the 488 participants that attended the scheduled regional workshops revealed that all of the sessions were of high quality. Mean ratings for the individual workshop presentations were 4.75 \pm 0.63 for “Degenerative Disease Risk Factor Reduction Through Exercise”; 4.43 \pm 0.92 for “Prevention and Treatment of Lower Back Disorders”; and 4.5 \pm 0.89 for “High Energy Nutrition.” These mean values appraised all three presentations of the awareness phase of this study between “excellent” and “very good” and suggest that participants appreciated the presentations, thus implying that a certain degree of awareness was accomplished.

Assessment. The results of the TC/HDL ratio reported by the biomedical lab (Table 1) revealed that of the 488 subjects tested, 140 (or 30%) had values below the 13% risk level for CAD; 202 (or 42%) had values between the 13 and 25% risk level for CAD; and 118 (or 25%) had values between the 26 and 50% risk level for CAD; and 15 (or 3%) had values between 51 and 75% risk level for CAD. These TC/HDL ratios appear to compare closely to values reported by other investigations that have studied similar age groups (Bryne, 1991; Castelli, Abbott, & McNamara, 1983; Cooper, 1988). Since the TC/HDL ratio represents the second most powerful and independent predictor of CAD (Anderson, Castelli, & Levy, 1987), the high values reported in this study demonstrate the need for follow-up intervention programs to lower these values and reduce the risk of CAD.

The TC/HDL ratio is a much more powerful predictor of CAD than either the TC or the HDL values (Anderson, Castelli, & Levy, 1987). This is because the TC values include both the good cholesterol fraction (HDL) and the bad cholesterol fraction (LDL) and the HDL values are limited to the good cholesterol fraction. Therefore, the interpretation of cholesterol values in this study was restricted to the most powerful prediction fractions—the TC/HDL ratio. The fact that 70% of the subjects tested in this study were above the 13% risk factor for CAD makes clear the need for exercise and nutrition intervention programs to reduce the TC/HDL ratios in Florida school food service workers.

The results of the body fat percentages showed that of the 488 subjects tested, 15 (or 3%) were at low CAD risk; 49 (or 10%) were at average risk; 141 (or 29%) were at high risk; and 283 (or 58%) were at very high risk (Table 2). Since there is no direct way to correlate CAD risk with specific levels of body fat percentage, the norms used in this study were values formulated from the percentage body fat reported by Benke & Wilmore, 1974; Katch & Katch, 1984; McArdle, Katch, & Katch, 1986) and the fact that body fat percentage represents the third most powerful and independent predictor of CAD (Hubert, Feinleib, McNamara, & Castelli, 1983).

The high body fat percentages found in this study also appear to compare
Research in Action

Table 1. Total cholesterol/high-density lipoprotein ratio of Florida school food service employees

<table>
<thead>
<tr>
<th>TC/HDL Ratio</th>
<th>Male Norms</th>
<th>N</th>
<th>%</th>
<th>TC/HDL Ratio</th>
<th>Female Norms</th>
<th>N</th>
<th>%</th>
<th>CAD Distrib. Risk Range</th>
<th>Total Sample N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 3.5</td>
<td>1</td>
<td>11</td>
<td></td>
<td>&lt; 3.3</td>
<td>139</td>
<td>30</td>
<td></td>
<td>&lt; 13</td>
<td>140</td>
<td>30</td>
</tr>
<tr>
<td>3.5-3.0</td>
<td>6</td>
<td>67</td>
<td></td>
<td>3.3-4.4</td>
<td>196</td>
<td>42</td>
<td></td>
<td>13-25</td>
<td>202</td>
<td>42</td>
</tr>
<tr>
<td>5.19-9.9</td>
<td>2</td>
<td>22</td>
<td></td>
<td>4.5-7.0</td>
<td>116</td>
<td>25</td>
<td></td>
<td>26-50</td>
<td>118</td>
<td>25</td>
</tr>
<tr>
<td>&gt; 9.5</td>
<td>0</td>
<td>0</td>
<td></td>
<td>7.0</td>
<td>15</td>
<td>3</td>
<td></td>
<td>51-75</td>
<td>15</td>
<td>3</td>
</tr>
</tbody>
</table>

Closely with the values found in assessment programs conducted at other corporate entities (Nagley, personal communication, May 1990; Bowman, personal communication, March 1991). The large percentage of subjects that were at high risk (29%) and very high risk (58%) because of their body fat percentage levels provides further justification for intervention programs to help reduce the body fat levels in Florida school food service employees.

The systolic blood pressure results (Table 3) were disclosed that of the subjects tested, 400 (or 82%) were classified as “normal,” 83 (or 17%) were classified as “borderline,” and 5 (or 1%) were classified as “hypertensive” (high blood pressure).

The diastolic blood pressure results indicated that of the 488 subjects tested, 234 (or 48%) were classified as “normal,” 176 (or 36%) were “high normal,” 49 (or 10%) were “mild hypertensive,” 29 (or 6%) were “moderate hypertensive,” and none were “severe hypertensive.”

These results also agree with the values found in assessment of other similar age groups (Nagley, personal communication, May 1990; Bowman, personal communication, March 1991; Julius, Jamerson, Mejia, Shork, & James, 1990) and makes clear the need for an intervention program for food service workers to help them prevent the onset of hypertension.

Intervention. Five phases of the regional workshops were designed to provide performance intervention experiences. These experiences were considered intervention because they involved active participation by food service employees rather than passive listening, which occurred during awareness presentations.

Participants rated the quality of the presentations on a 5-point scale ranging from 1, poor, to 5, excellent. Mean ratings for the workshop components were 4.36 ± 0.85 for the physiologic assessment, 4.76 ± 0.44 for the 1-mile walk, 4.41 ± 0.65 for the lowfat/high-energy lunch experience, 4.65 ± 0.60 for the stretch breaks, and 4.26 ± 0.84 for the wellness manuals. These high values lie between “excellent” and “very good” on the evaluation questionnaire and suggest that the participants enjoyed these performance experiences.

Table 2. Percent body fat values of Florida school food service employees

<table>
<thead>
<tr>
<th>Range</th>
<th>Male</th>
<th>N</th>
<th>%</th>
<th>Range</th>
<th>Female</th>
<th>N</th>
<th>%</th>
<th>CAD</th>
<th>Total Sample N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-8%</td>
<td>0</td>
<td>0</td>
<td></td>
<td>12-16%</td>
<td>0</td>
<td>0</td>
<td></td>
<td>very low</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9-23%</td>
<td>0</td>
<td>0</td>
<td></td>
<td>17-21%</td>
<td>15</td>
<td>3</td>
<td></td>
<td>low</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>14-16%</td>
<td>2</td>
<td>17</td>
<td></td>
<td>22-26%</td>
<td>47</td>
<td>10</td>
<td></td>
<td>average</td>
<td>49</td>
<td>10</td>
</tr>
<tr>
<td>17-19%</td>
<td>3</td>
<td>25</td>
<td></td>
<td>27-31%</td>
<td>138</td>
<td>29</td>
<td></td>
<td>high</td>
<td>141</td>
<td>29</td>
</tr>
<tr>
<td>&gt; 19%</td>
<td>7</td>
<td>58</td>
<td></td>
<td>&gt; 31%</td>
<td>276</td>
<td>58</td>
<td></td>
<td>very high</td>
<td>283</td>
<td>58</td>
</tr>
</tbody>
</table>

Table 3. Blood pressure values for Florida school food service employees

<table>
<thead>
<tr>
<th>Pressure (mmHG)</th>
<th>Subjects</th>
<th>Male</th>
<th>Female</th>
<th>Hypertension Classification</th>
<th>Total Sample Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systolic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 140</td>
<td>8</td>
<td>67</td>
<td>392</td>
<td>82</td>
<td>normal</td>
<td>400</td>
</tr>
<tr>
<td>140-159</td>
<td>4</td>
<td>33</td>
<td>79</td>
<td>17</td>
<td>borderline</td>
<td>83</td>
</tr>
<tr>
<td>&gt; 160</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>1</td>
<td>hypertension</td>
<td>5</td>
</tr>
<tr>
<td>Diastolic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 85</td>
<td>6</td>
<td>50</td>
<td>228</td>
<td>48</td>
<td>normal</td>
<td>234</td>
</tr>
<tr>
<td>85-89</td>
<td>3</td>
<td>25</td>
<td>173</td>
<td>36</td>
<td>high normal</td>
<td>176</td>
</tr>
<tr>
<td>90-104</td>
<td>2</td>
<td>17</td>
<td>47</td>
<td>10</td>
<td>mild</td>
<td>49</td>
</tr>
<tr>
<td>105-114</td>
<td>1</td>
<td>8</td>
<td>28</td>
<td>6</td>
<td>moderate</td>
<td>29</td>
</tr>
<tr>
<td>&gt; 114</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td>severe</td>
<td>0</td>
</tr>
</tbody>
</table>
APPLICATION

The individual physiologic test results that were distributed to the wellness workshop participants provide a baseline to objectively track the TC/HDL ratio, percentage body fat, and blood pressure changes they may experience from their respective local unit’s anticipated wellness intervention support program. The 1-mile walk experience furnishes an activity that can

- be habituated when participants return to their respective worksites that will reduce the TC/HDL ratio,
- burn more fat than carbohydrate and lower body fat percentage,
- challenge the cardiovascular system and reduce blood pressure,
- strengthen bone tissue and help prevent osteoporosis,
- provide a divergent neurohormonal pathway to redirect the autonomic nervous system’s response to distress,
- release endorphines to create a natural high,
- enhance self-image by virtue of physical performance accomplishments as measured by distances walked and times of completion.

The lowfat/high-energy lunch experience serves as a stimuli base to encourage adherence to a lowfat, high-complex-carbohydrate diet that includes the nutritional balance and strategic eating behaviors that reduce the dietary risk factors associated with CAD. The stretching break affords and opportunity to expose the participants to some basic stretch maneuvers that can be used in a local flexibility regimen that can be incorporated into the wellness programs anticipated at each of the local worksites. And finally, the distributed wellness manual presents a printed guideline that the workshop participants can use as a reference guide as they structure and conduct their respective local unit’s wellness programs.

REFERENCES


Feeding the Special Needs Child: A New Dimension for School Food Service

Harriet H. Cloud, MS, RD

The purpose of this article is to review the role of the National School Lunch and Breakfast Programs related to legislation existent since 1975 mandating free public education in the least restrictive environment for all handicapped children. The growing recognition of the importance of adequate nutrition and the difficulty among handicapped children in attaining this is reviewed from a historical perspective. New legislation, P.L. 99-457—for bringing services, including nutrition, to preschool children and later to infants and toddlers and will have further impact on school food service—also is discussed. The nutritional needs of four chronic conditions—Down syndrome, cerebral palsy, spina bifida, and phenylketonuria—are described with the special needs these children may present related to the menu, texture considerations, seating, special utensils for feeding, and setup of the dining area.

Garrett and Dappenfield (1984) estimated that 10 to 20% of all children in the United States have a chronic disease or handicapping condition. Nutritional concerns accompany many of the disorders falling into this classification.

The first recognition of the importance of nutrition, which would later impact on the role of schools providing education for this population, was the legislation written in 1963, P.L. 88-164, also known as the Mental Retardation Facilities and Community Mental Health Center Construction Act. This legislation developed research and training centers now known as University Affiliated Programs (UAP), and developed state plans for community-based services (Oglesby, 1988). Nutrition was listed as a required component in the UAPs, thereby increasing awareness of its importance. As a result, training of nutritionists has had a far reaching effect in identifying the role of nutrition in intervention and treatment programs for infants, children, teenagers, and adults who are developmentally disabled, mentally retarded, and physically handicapped.

In 1975, landmark legislation, P.L. 94-142, the Education for All Handicapped Children Act, was passed mandating free public education in the least restrictive environment for all handicapped children ("Education for All Handicapped Children," amended 1982). Although many school systems were providing special education, this legislation increased the numbers of children with handicapping conditions attending school for which services must be provided. The impact of providing meals to increasing numbers of children with complicated nutrition problems not usually serviced by the school food service programs was inevitable.

P.L. 94-142 recognized the special needs of the mentally retarded and developmentally disabled child by funding speech therapy, audiology, physical therapy, occupational therapy, psychology, and special education services; nutrition and nursing services, however, were not included. The need for special attention to the nutritional needs of the handicapped child, including feeding and food modification, has been apparent for the institutionalized individual but has been overlooked over the years as normalization became a key issue.

In 1976 increased attention for nutrition services for children with special health-care needs was mandated through state agencies known as Crippled Children's Services (Baer, 1982). Later in 1985, P.L. 99-457 was written as an amendment to P.L. 94-142 with the intent of extending services for the special needs child who is

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3 to 5 years of age and optional services for the 0-to-2-year age group. This law adds nutrition services not covered by P.L. 94-142 along with other disciplines such as social work (National Center for Clinical Infant Programs, 1989). Following the passage of this legislation, the Surgeon General's Report on children with special health-care needs was published, promoting a conceptual framework of service that is family centered, community based, and comprehensively case managed (U.S. Department of Health and Human Services [USDHHS], 1989).

In the midst of all this legislative activity and coexisting with special education services provided these children is the school food service program. School food service is designed to provide good nutrition to children, meeting the guidelines set out by the United States Department of Agriculture (USDA). School food service menus in the elementary years are planned to provide one-third of the Recommended Dietary Allowances (RDA) for the 10-to-12-year-old child, also known as the USDA "reference child." At the high school level, quantities of food served are increased. Energy needs of the special needs child often vary from the USDA reference child. Other challenges include texture considerations, special equipment and nutrition modifications for allergies, inborn errors of metabolism, obesity, and tube-fed children.

The importance of nutrition for the school-age child has been recognized for many years by various federally funded programs such as Head Start, school food service, Women, Infants, and Children (WIC), Child and Adult Care Food Program, and Summer Food Service Program. The focus, however, has been on nonhandicapped children (Dwyer & Freeland, 1988).

As the UAPs have trained vast numbers of dietitians and nutritionists in a 20-year period, they also have conducted nutrition workshops in public health regions and individual states. These seminars and workshops have included school food service administrators and managers who recognize the challenge to the food service staff of providing services for the severely handicapped child and the importance of working with special education personnel in a problem-solving partnership (Thorius, 1986).

In a recent Congressional Record, Sen. Robert Dole (May 17, 1991) stated the importance of the National School Lunch Program and School Breakfast Program for some 25 million children, including children with developmental disabilities and special health-care needs. He further pointed out that the USDA Child Nutrition Act and Section 504 of the Rehabilitation Act regulations require schools to provide special meals at no extra charge to children with medical certification that disabilities restrict their diets. Studies conducted in various states and regions have indicated that not all school districts are aware of the Section 504 regulations and many fail to comply (Horsley, 1988).

This paper will address the challenges to school food services of four chronic disorders found frequently among handicapped populations: Down syndrome, cerebral palsy, spina bifida, and phenylketonuria (PKU).

**NUTRITION PROBLEMS OF CHILDREN WITH SPECIAL NEEDS**

**Down Syndrome.** Down syndrome is a chromosomal disorder that affects both mental and physical development. The individual with Down syndrome, named for J. Langdon Down, the British physician who described the disorder, has a distinctive physical appearance and is mentally retarded. The cause of the syndrome is the occurrence of an extra chromosome, most commonly chromosome 21, making a total of three instead of the usual pair. The incidence of Down syndrome in the United States is 1 in 800 births, sparing no race, class, or ethnic group (USDHHS, 1989).

Children with Down syndrome are distinguished by distinctive facial features such as a flat nose bridge, slanted eyes, protruding tongue, and hypotonia over most of their body. Nearly 40% of infants born with Down syndrome have a heart defect and a tendency toward an otherwise rare form of childhood leukemia. Frequently, a child with Down syndrome has problems with hearing, vision, and speech.

Growth for children with Down syndrome is slow. At birth they may be lighter and shorter in length than other infants. During the first six months of life, their growth rate is similar to the normal infant and the slowing of growth rate occurs between 6 and 24 months of age, producing a lag into adulthood. Weight gain continues with no slowing, placing the child at risk for obesity.

The generalized hypotonia found in these children contributes to delays in gross motor development, limited physical activity, and lowered energy needs. Some research related to energy needs has resulted in recommending 14 to 16 kilocalories per cm of height. For the average 8-year-old boy or girl with Down syndrome, this would amount to 1,000 kilocalories as compared to 2,000 kilocalories for a normal child.

Other problems that may influence participation in the school lunch program include feeding problems of an oral motor nature, such as poor lip control, and difficulty in chewing and drinking from a straw, coupled with difficulty in handling feeding utensils. Chewing weakness makes it very difficult for the child with Down syndrome to handle regular textured food. When it exists, training by occupational therapists and speech therapists can strengthen the oral musculature, increasing the possibility of feeding normally.

**Cerebral Palsy.** Cerebral palsy is a chronic condition resulting from nonprogressive brain damage. The incidence is estimated to be from 1.5 to 2 per 1,000 live births (Gaisel & Patrick, 1988) and can occur in the prenatal, natal, or postnatal period. Depending upon the severity of the conditions and the extent of neurological involvement, the child with cerebral palsy may have extensive gross motor delays, including the inability to sit without support, walk, or crawl.

Frequently the child with cerebral palsy has an oral motor feeding problem that interferes seriously with adequate nutrient intake. The oral motor problem consists of tongue thrust, abnormal oral reflexes, chewing difficulty, poor lip closure, gagging, choking, and swallowing difficulties. Often the child has poor head control and trunk stability, which interferes with the ability to attain appropriate positioning, thereby making feeding difficult (Kozlowski, 1990; Lane & Cloud, 1988).

The assessment and intervention of feeding problems require an interdisciplinary approach involving the parents, physical therapists, occupational therapists, speech pathologists, nutritionists, nurses, psychologists, and special educators. For optimal planning, the school food service manager also should be a member of this feeding team (Lane & Cloud, 1988).

Among the considerations for the child with cerebral palsy are modifying food texture, thickening liquids to
Professional Development

enhance swallowing, and substituting menu items that are appropriate for texture modification (Lane & Cloud, 1988). Energy needs for the child may be increased with possible consideration of supplemental beverages or between-meal feedings.

Spina Bifida. The incidence of spina bifida in the U.S. is 4.3 in 10,000 live births (USDHEHS, 1989). Manifesting itself as a lesion in the spinal column formed during the first trimester of pregnancy, this disorder is frequently accompanied by difficulty in ambulation, urological problems, neurological problems, constipation, hydrocephalus, and feeding problems when the Arnold-Chiari malformation exists (Ekvall, 1988).

Growth is slow in these children, and length or height is below normal throughout childhood, adolescence, and adulthood. Lack of growth, limited ambulation, and hypotonia contribute to obesity. This further limits ambulation and adds to frequent replacement of equipment such as wheel chairs, braces, and other appliances needed to increase physical activity.

Nutritional management of constipation requires increasing the fiber and fluid content of the diet. Often the child with spina bifida has difficulty consuming raw fruits and vegetables and whole grain cereals, which are high in fiber content. Increasing water consumption always is advised for problems with constipation and for correcting the urological problems so frequently found in this population (Ekvall, 1988).

Inborn Errors of Metabolism. Children with PKU have an inborn error of metabolism as do children with diabetes mellitus, galactosemia, arginosuccinic aciduria, and approximately 100 other metabolic problems. Dietary management is crucial for preventing mental retardation and providing the nutrients required for growth and health status throughout life.

PKU has an incidence of 1 in 12 to 14,000 live births and involves the child's inability to normally metabolize phenylalanine, one of the essential amino acids. This results in a buildup of phenylalanine in the blood, leading to mental retardation if the child is not treated after being identified. Screening for the disorder occurs shortly after birth, and once diagnosed, a special infant formula is required for treatment (Elsas & Acosta, 1988).

As the child with PKU grows, solid food, consisting of cereals, fruits, and vegetables, is added to the diet along with the formula. This then becomes the food pattern throughout life, as mandated by current treatment protocols based on research related to growth and intellectual development (Elsas & Acosta, 1988). Adherence to the diet improves the child’s ability to function successfully in the educational environment. For the girl with PKU dietary compliance leading to blood levels of phenylalanine within a range of 2 to 6 mg will ensure a normal offspring when she becomes pregnant (Elsas & Acosta, 1988).

Problems cited by parents of school-age children with PKU and other inborn errors of metabolism include storing formula, finding food items on the menu that are sufficiently low in phenylalanine, and the child's embarrassment in requiring foods different from their peers. This author has found that school-age PKU children will miss lunch or select only a beverage and eliminate their formula. This contributes to very poor control manifested in elevated blood levels that may result in learning difficulties.

**ROLE OF THE SCHOOL LUNCH PROGRAM**

Implications for the School Food Service Program to serve the child with special needs requires three key elements: menu modification related to texture, calories, and nutrients; environmental considerations; and collaboration with the special education faculty and parents (Hersley, 1988).

**Texture Modification.** Menu modification related to texture may be required for the child with oral motor problems as previously described. If blended food is required a separate menu may be necessary depending upon the regular menu (Table 1). Blending or grinding food in the main area of food production is recommend over sending food to the classroom for blending by the special education teacher. Lack of control of food-handling practices and sanitation in the classroom are obvious reasons for modifying foods in the school kitchen.

**Nutrient Modifications.** The energy requirement may be higher for the children with cerebral palsy and lower for the child who has Down syndrome or spina bifida. When nutrition assessment of the child indicates an area for menu modification related to energy, cooperation is needed between parents, teachers, and school food service personnel. Menu modification for the child with lowered energy needs could include fresh fruit in place of puddings, cakes, and cookies; avoidance of high-fat items; increased salad selections; smaller portions; and lowfat milk. Supervision of the child during meal times is beneficial to ensure no food procurement from other children or serving of second portions (Heinrich & Rokusek, 1985).

The opposite is true for the underweight child needing increased calories. Providing homogenized milk and regular-sized portions with refills and adding unsaturated fat to vegetables or blended foods along with fine bread crumbs will add extra calories. Some schools have successfully used supplemental beverages in the form of milkshakes.

**Table 1. Modification of the school lunch menu for texture, calories and phenylalanine**

<table>
<thead>
<tr>
<th>Regular Menu</th>
<th>Blended Menu</th>
<th>Calorie Controlled Menu</th>
<th>PKU Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground beef patty with gravy</td>
<td>Ground beef patty blended in gravy</td>
<td>Ground beef patty (no gravy)</td>
<td>Omit</td>
</tr>
<tr>
<td>Mashed potatoes</td>
<td>Mashed potatoes</td>
<td>Mashed potatoes</td>
<td>Baked potato</td>
</tr>
<tr>
<td>Green beans</td>
<td>Blended green beans</td>
<td>Green beans</td>
<td>Green beans</td>
</tr>
<tr>
<td>Sliced tomatoes</td>
<td>Omit</td>
<td>Sliced tomatoes</td>
<td>Sliced tomatoes</td>
</tr>
<tr>
<td>Cupcakes</td>
<td>Applesauce</td>
<td>Apple</td>
<td>Applesauce</td>
</tr>
<tr>
<td>Milk</td>
<td>Milk</td>
<td>Lowfat milk</td>
<td>Formula</td>
</tr>
</tbody>
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Menu modification related to amino acids is necessary for children with inborn errors of metabolism such as PKU and will result in a child better able to adhere to the diet. Generally, such a modification will follow the example cited in Table 1.

Inclusion of items not on the menu will require ordering, storing, and preparing foods different from the regular menu plan. This will increase work and food cost on the part of the school food service staff but is clearly important for the individual student’s well-being. A physician’s order is required by the school specifying the diet plan, and in most schools the child will provide the formula. Foods high in protein such as meat, fish, and dairy products would require substitution generally with vegetables, cereals, or fruits.

Control of the Environment. To satisfy the philosophy of normalization, increasing numbers of children with handicapping conditions will be served in the school dining room rather than the classroom. Organizing the arrangement of tables and chairs is the food service manager’s responsibility. Many children will enter the cafeteria in wheelchairs which may cause traffic flow problems. Since some children eat very slowly, they may need more than one lunch period to finish their meal (Thorius, 1986). Distractibility, caused by traffic flow and noise, is a problem for children with cerebral palsy, Down syndrome, and other children with handicaps. Locating them in a quiet part of the cafeteria in the area with the least traffic flow should reduce the problem.

Special utensils for assisting a child in learning to self-feed are needed. They may include special plastic-coated spoon-forks that are bent in a direction to facilitate hand-to-mouth coordination and special cups and plates. These utensils must be handled, sterilized, and stored differently from regular utensils (Thorius, 1985).

Collaboration with Special Education Faculty and Parents. Incorporating nutritional needs such as texture modifications or energy and nutrient modifications should be part of the Individualized Educational Plan (IEP). The IEP is developed each year by the special education teacher in collaboration with the parent and other disciplines such as speech therapy, physical therapy, etc. The food service manager and a nutrition consultant also should participate in that process. Incorporating nutritional needs and intervention as part of the IEP will make the parent aware of what the school plans to do, so that the same procedures are duplicated at home.

Summary

Increased recognition of the nutritional risk of many chronic conditions found among children with special health-care needs served in the public school system should lead to heightened awareness of the importance of the school food service program’s inclusion in special education services. Recent surveys (Horsley, 1988) have shown that nutrition is not always included in the IEP, in which the student’s needs are listed and goals set to meet these needs. Many conditions have placed this population of children at nutritional risk resulting in slower growth, lack of energy to participate in educational activities, impaired concentration, and frequent absenteeism. Gandy, Yadrick, Boudreaux, and Smith (1991) found food service supervisors in Mississippi schools reporting a need for additional training in modifying menus for children with handicaps.

Increased nutrition services have been mandated under P.L. 99-457 for the infant and preschool child and should lead to increased nutrition services in P.L. 94-142, within the present National School Lunch and Breakfast Programs. School food service personnel are encouraged to have a heightened awareness of the need for nutrition appropriate for the handicapped child and work creatively in ensuring each child’s full participation in the lunch and breakfast programs.

References


### Professional Development

#### Test Answer Sheet

"Feeding the Special Needs Child"

You must submit this answer sheet by December 1, 1992, to be eligible for one hour of ASFSA certification credit.

Please print or type

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### Circle the correct answer.

1. Estimates made in the 1980s suggested that ___% of children have chronic or handicapping conditions.
   a. 1 to 2
   b. 5 to 8
   c. 10 to 20
   d. more than 30

2. Research and training centers, now known as University Affiliated Programs, were established by P.L. 98-164, the Mental Retardation Facilities and Community Mental Health Center Construction Act.
   a. true
   b. false

3. Children with Down syndrome
   a. are mentally retarded
   b. have distinctive facial features
   c. have a slower growth rate
   d. all of the above

4. Menu modification in texture may be required for children with oral motor problems.
   a. true
   b. false

5. P.L. 94-142, the Education for All Handicapped Children Act, provided special funding for speech therapy, audiometry, and physical education, but did not provide funds for nutrition services.
   a. true
   b. false

6. Children with spina bifida
   a. usually have normal growth
   b. often have no difficulty in ambulation
   c. frequently have difficulty with constipation
   d. all of the above

7. School food service managers should consider locating children with Down syndrome and cerebral palsy near the main traffic flow of the cafeteria so the activity will help reduce their distraction and thus increase their food intake.
   a. true
   b. false

8. Dietary management is critical in children with PKU to prevent mental retardation.
   a. true
   b. false

9. P.L. 94-142 decreased the numbers of children with handicapping conditions attending school for which services had to be provided.
   a. true
   b. false

10. Considerations for feeding children with cerebral palsy may include
    a. modifying food texture
    b. thickening liquids
    c. reducing caloric content
    d. all of the above
    e. a and b only

11. Modifying the texture of a baked chicken breast suggests that the meat was ground or blanderized before being served.
    a. true
    b. false

12. Statements by Sen. Robert Dole indicate that the USDA Child Nutrition Act and Section 504 of the Rehabilitation Act require schools to provide special meals at no extra charge to children with medical certification that disabilities restrict their diet.
    a. true
    b. false

13. PKU is a chromosomal disorder.
    a. true
    b. false

14. Which of the following might be considered an appropriate menu modification for a child with spina bifida?
    a. serve a cupcake instead of a roasted fruit for dessert
    b. serve bland meat instead of regular meat
    c. serve low-fat milk instead of whole milk
    d. all of the above

15. Children with cerebral palsy may require special utensils to help them feed themselves.
    a. true
    b. false

16. Children with Down syndrome usually are very active and may require extra snacks to increase their caloric intake.
    a. true
    b. false

17. Which of the following might be characteristic of the meal offered a child with PKU?
    a. absence of meat
    b. absence of milk
    c. inclusion of special PKU formula
    d. all of the above

18. According to P.L. 98-164, the Mental Retardation Facilities and Community Mental Health Center Construction Act, nutrition is a required component of University Affiliated Programs.
    a. true
    b. false

19. Foods prepared for children with Down syndrome may need to be modified in texture because of oral motor feeding problems.
    a. true
    b. false

20. PKU involves a child's inability to normally metabolize
    a. glucose
    b. fat
    c. phenylalanine
    d. none of the above

21. Children with cerebral palsy may not be able to sit without support, crawl, or walk.
    a. true
    b. false

22. The school food service manager and a nutrition consultant should not have to participate in developing the Individual Education Plan for special needs children.
    a. true
    b. false

23. Increasing water consumption is often advised for children with spina bifida.
    a. true
    b. false

24. Down syndrome is
    a. a chromosomal disorder
    b. an inborn error of metabolism
    c. caused by a malfunction of the liver
    d. none of the above

25. Cerebral palsy is a chronic condition resulting from nonprogressive brain damage.
    a. true
    b. false

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**These articles are approved for national certification only. Check with your state certification chair to see if your state also gives credits toward certification for these articles. When you receive the graded test from national headquarters, apply to your state certification chair or process for state continuing education credit. Mail this completed answer sheet with a self-addressed, stamped envelope and $4 (ASFSA members) or $11 (nonmembers) processing charge to ASFSA, Professional Development Article (Spring 1992), 1600 Duke St., 7th Floor, Alexandria, VA 22314-3436. If after four months of submitting this test you have not received your test results, contact the ASFSA Certification Department at (800) 877-0825.**

52

School Food Service RESEARCH REVIEW, 16(1) 1992
Participation in Child Nutrition Programs

Erskine R. Smith, PhD, RD, associate director, Sharon Weatherby, MBA, research associate, Jeannie Sneed, PhD, RD, director, and Kaylene T. White, MS, research associate, Division of Applied Research, National Food Service Management Institute

Participation in the National School Lunch Program (NSLP) and the School Breakfast Program (SBP) is of concern to school food authorities (SFAs), school food service operators, and the U.S. Department of Agriculture (USDA) for two reasons: (1) both the NSLP and SBP are important components in the education of American children as the programs have a positive impact on children's receptiveness to learning activities and readiness to learn and their attention, and (2) these programs are designed to contribute to the nutritional well-being of the school-age child. The decline in NSLP participation in the early 1980s resulted from budget cuts. NSLP participation level at the end of the 1980s remains below the record high established in 1979 of an average 27 million participants daily. The daily participation in the SBP in 1989 showed a modest increase over the 1979 level of 3.32 million participants. The 1989 level for SBP participation is the same as the 1981 level. SFAs, school food service operators, and other individuals interested in school nutrition programs must become aware of factors affecting participation if these programs are to continue to serve a major proportion of the school-age child in this country and to contribute to the nutritional well-being of children.

This bibliography is a compilation of research and anecdotal reports appearing in the literature during the past 25 years related to participation in the NSLP and SBP. During that time, legislation and operational guidelines of the NSLP and SBP have changed significantly. These changes, along with budgetary allocations, have affected participation in the programs.

Many of the research citations included were from the School Food Service Research Review, reports prepared for the USDA or for the U.S. Congress, and graduate research studies. These research studies tended to concentrate on factors affecting participation, evaluation of selected aspects of school lunch and breakfast programs, and nutritional contributions of school lunch and breakfast programs.

Many of the articles related to marketing are anecdotal. Little empirical research was found on marketing in school nutrition programs. The references included in this bibliography are divided into three major categories: general factors affecting participation, including the subcategories of general studies, food preferences and acceptability, marketing, and production and delivery systems; and program outcomes. Within each category or subcategory, citations are presented in chronological order, beginning with the most recent year.

GENERAL


A summary of the trends in the NSLP is presented. The discussion of participation included comparisons made for participation in the three categories of free, reduced-price, and paid. Participation peaked at 27 million students in Fiscal Year 1979. An analysis of why participation rates peaked in the 1970s is presented as well as seasonal effects on participation. Other topics included are funding sources, federal costs, federal payments and commodities, and foods used in school. This article provides a good review of the NSLP during the 1970s.


The latest edition of this book outlines the dramatic changes in the school food service industry over the past five years. These include labor shortages, greater awareness of nutrition by the customers, food shortages, increased competition, escalating cost, increased media coverage of school lunch programs, technology changes, and increased accountability. The chapter on marketing and promoting school food service concentrates on environmental factors that have forced the marketing of school lunch in order to increase participation. An example of a 1988 participation study for one major school district listed five factors affecting nonparticipation, including a decreased interest in school lunch at the ninth-grade level or age 15, concern for food variety for senior high students, different food preferences for ethnic groups, varying attitudes toward free and reduced-price meals among ethnic groups, and the reduction in participation at schools with morning breaks. The participation rates for females are linked to programs that offer reduced-calorie meals. To increase participation, schools must understand their customers and design marketing programs to meet the customers' needs.

The third report from the National Evaluation of School Nutrition Programs obtained from a national sample of students, parents, school food service administrators, and school administrators focused on factors affecting participation and characteristics of participants in the NSLP, SBP, and Special Milk Program. Benefits of participation in school nutrition programs were identified; a major benefit of participation was the improved nutritional status of participants when compared to nonparticipants. Meal price was one factor found to influence participation in the NSLP.


In 1983, schools were required to verify 2% or 3,000 forms, whichever is less, for free and reduced-price meal applications as a result of the National Evaluation of School Nutrition Program project. The requirement assisted in targeting the students in need and attempted to maintain program integrity.


This article discusses the major changes in legislation resulting from the Omnibus Budget Reconciliation Act of 1981. Impact of the changes on school nutrition programs is discussed in detail for each program.


The article summarizes changes that occurred since 1974 in the NSLP, SBP, Special Milk Program, Child and Adult Care Food Program, Summer Food Service Program, and Special Supplementation Food Program for Women, Infants, and Children. Changes were designed to increase participation, reduce plate waste, lower costs, and increase flexibility.


The objective of the General Accounting Office's (GAO) review was to determine if "innovative" approaches were solving or aggravating problems related to school lunch. This report is a detailed presentation of GAO's evaluation of 14 high school food service programs, two each from seven school districts. High school food service programs are facing declining participation rates, increased plate waste, and increased meal cost. Some of the findings indicated that none of the "innovative" service styles used in the school districts met the nutritional requirements of the program. Data related to factors that increase participation in high schools and how to reduce plate waste also were discussed.


This report was submitted to Congress in May 1980. The first four chapters of the report address the history, focus, and cost of child nutrition programs. Chapters 5 and 6 present the nutritional outcomes of the programs and innovative approaches to implementing, funding, monitoring, and directing the programs. The concept of universal free lunch is discussed in Chapter 6.


This article compares results of a 1972 nationwide survey on school lunch participation with results of a 1975 survey. Participation rates were higher in 1975. Factors affecting partic-

ipation such as price, lunch alternatives, school size, and preparation sites were analyzed.


Issues affecting school food services are presented from three perspectives. School food service is viewed as a food delivery system, as a nutrient delivery system, and as a food nutrition, and health education delivery system. Several topics for research are presented.


This article presents a statistical breakdown of where students ate lunch in January 1975. These data were collected from schools participating in the NSLP as well as from schools that did not participate in the program.


Florida and the Food and Nutrition Service (FNS) funded the Advancement of Nutrition Service and Education Research Project to study several aspects of school nutrition programs. Participation, food habits, cooperative purchasing, and food preparation facilities were some of the topics studied.


This is an extensive report of a study comparing participation of schools and individuals in the NSLP in 1957, 1962, and 1968. An historical overview of lunch in schools is presented. Several factors that affect student participation were discussed including price per meal and advance publication of menus.


This article gives a brief overview of the NSLP. The primary emphasis is on the major difficulties affecting the NSLP. Suggestions for alleviating some of the financial problems of the program are presented. Suggested legislative and judicial changes are proposed as is the concept of universal free lunch.

FACTORS AFFECTING PARTICIPATION
A. General Studies


An ethnically diverse group of students from seven urban high schools were surveyed to ascertain their opinions and satisfaction level with respect to the nutrient content and a variety of operational procedures used in the NSLP and to identify factors that may be related to participation. Students were dissatisfied with the amount of food and the price of the meal. The most frequent reasons cited for nonparticipation were taste of food, time involved, and too few menu choices. Data suggest that income status was not a significant factor in the participation decisions of high school students receiving a free or reduced-price lunch.


Parents of third - to sixth-grade children from low-income households participating in the SBP in Lawrence, Massachusetts, were surveyed to ascertain their opinions about the program. One-third of the respondents were supportive of the program. The data suggest that children in the lower grades
Bibliography

who receive meals at no charge or are involved in the decision-making process about where they would eat breakfast were more likely to participate in the SBP.


Two of the objectives of this study were to compare 1979 and 1983 participation rates in school breakfast and lunch programs in selected schools in Colorado, Iowa, Kansas, and Missouri and to assess the impact of selected variables on participation in 1983. Lunch price, size of school, percent of reduced-price meals, and availability of other lunch alternatives were some of the variables that significantly affected lunch participation.


Factors affecting participation in the school lunch program are discussed. The following factors were identified: meal price, parental attitudes, age of student, gender, lunch at home, parents’ educational level, and the faculty and staff dining facilities.


A review of variables that affect participation in school nutrition programs is presented. Variables that have positive effects on school lunch participation included percentage of students approved for free and reduced-price meals and the food quality score. The percentage of students approved for free and reduced-price meals was a positive predictor of participation in school breakfast programs.


An overview of the variables that affect decisions to participate in the school lunch program are discussed. Variables included were: the price of the school lunch, the amount of the household’s Food Stamp Bonus, the race of the student, and consumption of selected nutrients at nonlunch meals.


This literature review was conducted for FNS as part of an equipment and menu choice study. This report focused on student participation, determinants of meal cost and economic cost, and production functions. Of particular interest is the authors’ critical review of research related to student participation in school nutrition programs. Each of the studies cited in the review is critiqued independently. A table that presents information about the sample, type of analysis, and significant findings is included.


Two models depicting factors affecting school and individual decisions to participate in the NSLP are presented. Factors that affect participation of children from low-income families are income, price, ethnic status, working mother, single parent, age, region, sex, and urban.


The primary emphasis of this study was the identification of demographic and lifestyle factors that affect junior high school students’ participation in school lunch. The students were divided into two groups, high participants and nonparticipants. Ten lifestyle factors—including concern about table manners when dining out, preference for restaurant table service, and a high grade point average—were identified as factors associated with nonparticipants. Some of the lifestyle factors related to high participation were receiving free meals, eating at least one meal with the family, and not having a snack after school. This study is of particular interest because it introduces the concept that students’ lifestyles may affect their decisions to participate in school nutrition programs.


In this detailed report submitted to Congress in June 1980, the GAO identified five barriers affecting expansion of the SBP: attitudes of the local community toward the program and its perceptions of needs and responsibility, program costs exceed federal reimbursement, low participation, difficulties related to operation of the program, and inadequacy or misguided efforts in promoting the program. Each of these points are thoroughly covered and recommendations are given on how to overcome some of these difficulties. The report also provides a history of the SBP and the rationale for its creation.


This article presents a discussion of factors that affect students’ participation in school lunch. Factors that have a positive effect on the participation rate include percentage of students who ride school buses to school and the percentage of students eligible for free and reduced-price meals. Other factors affecting participation rates were teachers’ perception of food quality and teachers’ attitude toward eating with students.


Participation in the NSLP was attributed to the lunch policies of the school and the price charged for the lunch. Administrative policies that affect participation include the use of central kitchens, sale of a la carte foods, and the open campus policy. The study used data from a 1972 survey conducted by the USDA Statistical Reporting Service. A model to analyze participation was conducted that included the three administrative policies and the price charged for school lunches. The results indicated that participation was higher in elementary schools that prepared food on campus, participation in high schools was not affected by location of preparation, and school size negatively affected participation in elementary schools.


The study presents direct price elasticities of demand from observations made in Pittsburgh schools. The direct price elasticities revealed that a 10% price increase would cause a 29.5% decrease in participation of paying students. The cross elasticities indicate that as prices increase most students cease to participate instead of transferring into the free lunch category.


The objective of this study was to assess sixth-grade students'
attitudes, school lunch participation, and plate waste when student-planned menus were served. Data from this study are inconclusive, but it does appear that plate waste can be minimized when student food preferences are considered in the menu-planning process. During the experimental phase of this study, student ratings of food items were higher than in the nonexperimental stages.


Many factors influence participation in the NSLP including the variety of food served, open campus policies during lunch time, distance of schools from students' homes or competitive eating establishments, transportation arrangements during lunch, and availability of low-priced milk to accompany sack lunches. Results indicate that the price charged for school lunch has an inverse effect on participation. For schools in the larger districts in Washington state, a $0.05 decrease in price increased participation by 6% while in smaller districts a $0.05 decrease in price increased participation by 5%.


The objective of this study was to identify program and student factors that affect student participation in the secondary school lunch programs in South Carolina. Three program factors—proportion of students bussed, the meal price, and the average home-school distance—were related significantly to participation. Significant differences were found between frequent and infrequent student participants for factors related to food, lunchroom and lunchroom conditions, price, and school food service employees’ attitudes toward students.


The objective of the study was to investigate attitudes of tenth-grade students and their parents toward school lunch programs in selected Louisiana high schools. Data related to why students choose to participate or not participate in school lunch and reasons why parents want or do not want their children to participate in school lunch are discussed. Schools that offer a choice of menus had higher participation rates than schools where only one menu pattern was offered. Students preferred food items served at home.


The primary focus of this study was to investigate factors affecting participation of tenth-grade students in selected school food service programs and to ascertain students' preference for selected food items. Some of the factors that affected participation includes open vs. closed campus, food quality, service line speed, cafeteria surroundings, and meal price. Students tended to place a high value on food quality.


The objective of this study was to identify factors that influence secondary students’ participation in school lunch programs in Utah. Number of grades included in the school, other eating facilities, lunchroom capacity, and choice vs. no choice menus were positively related to participation. Lunch price increase was inversely related to participation.

B. Food Preferences and Acceptability


Observation plate waste studies were used to determine student acceptability of specific menu items modified according to the recommendations of the Dietary Guidelines for Americans. High-fat vs. lowfat entrees, whole grain vs. enriched products, and fresh fruits and vegetables vs. canned items were compared. Lowfat entrees, whole grain rolls and fresh vegetables were as acceptable to students as traditional items, while baked and fresh fruit were less well accepted.


This article is first of a three-part series reporting findings of a two-year study of students' food preferences in North Carolina. Student ratings for entrees, vegetables, fruits, breads, desserts, and milk are given for elementary and secondary students. Elementary students ranked all groups higher than secondary students. Some of the best liked entrees for each of the two years for both elementary and secondary students were listed, as well as the most disliked entrees.


The second of the three-part series discusses preferences for fruits and vegetables served at lunch to North Carolina school children. Male students, both at the elementary and secondary levels, rated vegetables higher than the female students. Elementary students preferred that fruits and vegetables were served raw rather than prepared.


The final of a three-part series discusses acceptance of breads and desserts served in North Carolina schools over a two-year period. Yeast breads were more popular than quick breads. Sweet yeast breads were slightly more popular than plain yeast breads. The most popular desert item for both the elementary and secondary levels was ice cream.


Visual estimation, children’s ratings, and actual weighing of plate waste were three methods used to estimate consumption. Results of the study support the use of indirect measures for estimating individual plate waste and assessing effectiveness of the lunch program.


Plate waste was used as a measure of acceptability for high school students for four meal planning methods: Type A, offered vs. serve; complete Type A; Daily Food Guide; and free choice. A significant reduction in plate waste was found for the free choice method. Girls, regardless of the menu planning method used, consistently wasted more food than boys.

The authors explain how menus can be generated from students’ preferences for food items and desired frequency of the food item as well as consideration of cost and other production concerns. Samples of the instruments used to collect the data are presented.


This article discusses how a school district can make changes to increase participation and reduce plate waste. Clark County and Las Vegas, Nevada, school districts implemented the fast-food service in their operation while incorporating nutrient-fortified foods to meet one-third of the RDAs. Participation was increased while plate waste was reduced.


A sample of 29 elementary schools and 29 high schools was used to assess plate waste in schools participating the NSLP. Decreased plate waste was found when proper food service management was practiced.


This article reports results from interviews of children in their homes regarding preferences for selected food items. Comparisons of preference ratings for food items of white, black, and Mexican-Amercian children were reported.


Findings obtained from a study of elementary students that compared the utility of hedonic rating scales, amount-consumed ratings, and actual plate waste are presented. Students were asked to rate the foods they were served for lunch on both hedonic and amount-consumed scales. Plate waste measures were obtained randomly. Both the hedonic and amount-consumed scales were significantly related to consumption of food items for the group when compared with actual plate waste.


This article discusses results of interviews with 464 tenth-grade students attending school in one of 12 parishes in Louisiana. Students identified factors that they liked about school lunch as well as ones that they disliked.


This article reports findings of a student survey on school lunch in Honolulu. Students indicated that they thought school lunch was a bargain; that the food quality was low, and that portion sizes were too small. Fruits and vegetables were the most preferred food items.

**C. Marketing**


A description of how high school Youth Advisory Councils (YAC) can help increase participation in school nutrition programs is presented. Examples of how YAC groups functioned in several schools are discussed.


This article presents some of the innovative ideas implemented by the school food service director for Corona-Norco Unified School District in Corona, California. The director identifies the problems and discusses initiation of a program where the food service unit takes the food to the customer rather than having the customers come to the food service.


A discussion of how Fairfax County Public Schools have used marketing principles to increase participation. The author lists some of the methods that the food service department’s marketing consultant recommended for increasing participation.


The article highlights innovative approaches used by the Newark (California) Unified School District to attract high school students.


Schools employed a site-based management philosophy involving the entire school staff to ensure student satisfaction. The extended services included grandparents’ day, student participation in menu planning, breakfast in the classrooms, and staff and community use of facilities.


Increased participation was attributed to the development of menus that are linked to special events.


A description of how the New York City Board of Education’s “Join the Breakfast Club Campaign” increased participation by 30%.


This article discusses how La Crosse, Wisconsin, schools increased breakfast participation by 20% between September and March. The school district experienced a 34% increase in breakfast participation from the previous year following implementation of its marketing program.


This article summarizes presentations given by Elona Stewart, Nelda Downer, and Donna Anderson at the 1989 Industry Seminar. Stewart discussed principles of marketing while Downer and Anderson discussed their experiences with marketing campaigns in school nutrition programs.


Arizona schools have encountered image problems, low participation, increased competition, and financial strains but have combat these problems with a full-scale marketing campaign. The campaign included the development of a logo, advertising, public relations, fundraising, and food service employee seminars to ensure better customer relations.


A description of a project entitled “Be Better with Breakfast” was presented. The program was credited with increasing breakfast participation in elementary schools by as much as 121%.

Parcel, G.S., Simons-Morton, B.G., O’Hara, N.M., Baranowski, T.,
Bibliography


Data from "Go for Health" program substantiated the need for lowfat, low-sodium school lunches, expanded physical education classes that include more daily aerobic exercise, and increased classroom health instruction. An interview model was developed to assist in modifying these problems in an attempt to reduce the risk of cardiovascular disease.


A scientifically designed survey was employed to obtain reliable data on customer preferences, the decision-making process and parental influences, and effective channels of communication to aid in more effective planning and policy making. The article outlines important factors to consider when using market research.


The changing school lunch reflects the demands that the customer has placed on school food service programs throughout the country in recent years. The Type A school lunch is having to compete with a la carte meals, which in some instances are more popular. To satisfy student preferences and to meet the demands of balancing costs and sales, school food service programs must concentrate their efforts on developing menus that are acceptable to the customers while meeting the nutritional guidelines of the NSLP, marketing their programs to the students, and effectively managing food service programs.


Participation in school lunch programs is approximately 23.3 million students per day. The number of needy students enrolled in the free meals program increased to 10.2 million from 9.9 million in 1982. Food service directors attribute the participation levels to creative managers who use a customer-oriented marketing approach to their school lunch programs.


Student involvement consisting of planning, promoting, and serving school lunches increased interest in the program and reduced repetitious menus.


A cooperative grant from the Georgia Department of Education helped to change a noisy, untidy lunch hour at Carrolton High School into an orderly, pleasant one. The atmosphere of the cafeteria was transformed by students in various classroom projects. The more pleasant dining experience has increased participation and maintained a participation rate of at least 81% since the onset of the project.

D. Food Production and Delivery Systems


A comparison of cafeteria-style and family-style service was tested using facial hedonic scales to examine food preferences of students in grades 1 through 6. Dietary recalls were completed on random groups to measure nutrient intake. Schools operating cafeteria-style service rated the highest scores on food preferences and energy intakes were not significantly different based on serving method.


The study uses questionnaires for students in grades 4 through 6 to compare students' attitudes on eating atmosphere and food quality, quantity, and acceptance. Plate waste studies were used to compare cafeteria- and family-style food service for effects on food consumption. Schools with cafeteria-style service had a higher participation rate, which may be related to a higher number of free and reduced-price meals served and a higher food quality score. Students in the family-style service had less plate waste and higher food consumption.


Innovations in school lunches have made extraordinary changes in the types of food offered to students. School food service managers faced with increased competition and reduced federal subsidies are offering a la carte outlets to increase participation and reduce plate waste.


Improved dining atmosphere and family-style service provided social benefits for children, less plate waste, and greater acceptance of a variety of foods.


School lunch programs with limited production and storage facilities used family-style service to reduce plate waste and maximize use of production and storage facilities.


The alternative lunch types (Type A, Basic Four, and Free Choice) were compared to Type A Offer-Serve (TAOS) meal to determine the type of program favored by students and food service workers. Overall, students rated Free Choice the highest; the Basic Four was rated almost identical to TAOS. Managers indicated that students were more receptive to Free Choice, which produced less plate waste, although this method was the most difficult to serve due to problems with reimbursement, pricing, and payment.


This study compared plate waste and elementary school students' preference for four serving styles. The styles examined were the standard, optional portion size, self-serve, and family-style. All students in the study participated in each style of service. Self-serve and family-style service were more effective in reducing plate waste than the standard and optional portion size methods.


The problem of participation in an elementary school was solved with the introduction of a self-service program. Additional benefits include virtually nonexistent plate waste, faster service, and reduced service personnel. Guidelines for self-service programs are outlined.
Bibliography

Offer vs. serve: Take it or leave it. (1977). School Food Service Journal, 31(10), 49.

A five-member panel of the American School Food Service Association’s Nutrition Standards and Nutrition Education Committee discussed the October 1975 offer vs. serve regulation and its effect on reduced plate waste.


In response to low participation (45%) and increasing costs, a Type A fast-food lunch line was established with the objective of increasing participation. Participation increased by 25% and total cost decreased.


Students (customers) and food service workers benefited from the scramble-type service as compared to the old T-line service. Participation in the elementary and junior high schools increased to 68% and the high school to 80%.


Family-style lunches were tried once a week in a Denver, Colorado, elementary school with success. Food was placed on the table and the children were allowed to request the amount of food that they believed they would eat. Parents reported improved manners at home. Responses from students were positive and plate waste was reduced.


The Type A buffet line method vs. serve programs reduced plate waste, maximized cooking time, increased participation, and yielded a profit.


Two elementary schools combined nutrition education courses and family-style service to produce less plate waste and to provide more enjoyable lunches. One school reported a decrease of 3.2% in total weight of plate waste.


Evaluation of family-style dining in three elementary schools yielded favorable results from students, teachers, parents, and administrators. Benefits included a more pleasant environment, improved time efficiency, better eating habits, less plate waste, and increased participation.

Program Outcomes


The results of a study of the nutritional value of a la carte menu items at the high school level indicated that all nutrients analyzed, except vitamin C, were below adequate desired amounts. There were significant differences based on grade level and gender. The study suggests further research is necessary on a la carte menus and additional nutrition education is needed for students.


A random sample of lunches brought from home were compared with lunches following the Type A menu pattern. Percentages of sack lunches containing chips, soft drinks, and other food items are presented. Only one of the 121 home-prepared lunches studied met the Type A pattern.


School menus incorporating the Dietary Guidelines were compared to traditional menus in relation to nutrient content and student acceptance. Menus following the Dietary Guidelines exceeded one-third of the RDA for key nutrients and had higher student ratings than did traditional menus. Participation in programs with menus following the Dietary Guidelines increased 2.5% during a time of static school growth, income verification, and a price increase.


A kit developed by Connecticut’s Nutrition Education and Training (NET) Program was tested to determine its effects on school lunch participation and children’s willingness to try a variety of foods. Schools using the kit increased lunch participation and food consumption.


Calorie and nutrient intakes were compared for children who participated in school nutrition programs and those who did not participate. Participants’ intakes for almost all nutrients were higher than nonparticipants. School breakfast programs increase breakfast consumption; these meals provide more calcium, phosphorus, protein, and magnesium than breakfasts eaten elsewhere. Non-school breakfasts provided more vitamin A, B6, niacin, thiamin, and iron. The milk program was deemed extremely important to maintaining and improving children’s health.


The effects of participation in the NSLP and SBP on long-term nutritional status of children was determined. Height, weight, and triceps fatfold data were collected in this cross-sectional study. School lunch participation was related to weight but not to height. Breakfast program participation was weakly related to weight and triceps fatfold measures and not related to height. For younger children, fewer school lunch participants were below the 25th percentile for weight. The impact of school lunch participation appeared to be greatest for children participating in the program for a long time period.


Using data from the 1977-78 Nationwide Food Consumption Survey, the impact of school lunch participation on nutrient intakes for children (6 to 18 years) was determined. School lunch participation was associated with significant increases in nutrient intake, particularly for energy, calcium, riboflavin, iron, vitamin B6, and vitamin A.


A study to determine the eating patterns and caloric and nutrient intake of fourth-, eighth-, and eleventh-grade students was conducted in randomly selected public schools. Questionnaires
Bibliography

were used to determine the time of day and sources of food eaten during the school day. Nutrients provided in the school meal were compared to one-third of the RDA for the nutrients. Fourth-grade students had the highest intake of nutrients. Nutrient intakes for females in the eighth and eleventh grades often fell below one-third of the RDAs. Lunch meals provided the largest quantity of nutrients for the students.


A study to determine eating patterns during a 24-hour period and a comparison of the nutrient consumption was done by gender, grade level, and ethnic background; fourth-, eighth-, and eleventh-grade students were interviewed to obtain information about their food consumption in the last 24 hours. Male students met or exceeded the RDAs while female students failed to meet the RDAs. During school hours, the iron and vitamin A intakes for eighth and eleventh-grade students were low, especially for female students. The calcium intake of eleventh-grade females was low during school hours.


The major objective of this study was to determine if participation in the NSLP improved the nutrient intake of secondary students. Diet of students who participated in school lunch were significantly higher for all nutrients, except niacin, than were diets of nonparticipants.


Nutrient intakes were compared for black children in a low-income area in Los Angeles County. One school provided a breakfast program. Intake estimates, using 24-hour recalls, showed that all students met or exceeded the RDA for all nutrients except energy. Children in the school with a breakfast program consumed more of their daily intake before 10 a.m. than did children in the school not offering the breakfast program.


More than 700 Washington state school children were studied to ascertain relationships between dietary status and participation in the NSLP, SBP, and Food Stamp Program. Students who were full-time participants in the NSLP had higher intakes for five of 10 nutrients than partial or nonparticipants. The vitamin C intake of participants in the SBP was higher than that of partial or nonparticipants.


This study of 403 eleventh-grade students determined nutrient intakes, food attitudes, and preferences and discussed how these factors related to participation. Compared to nonparticipants, nutrient intakes for participants were higher for nine nutrients. Intakes of protein, riboflavin, and vitamins A, C, and B12 were above one-third of the RDA for all students. Students not participating in the program cited preparation of school food, school lunch period, and crowded cafeteria as reasons not to participate.


This plate waste study determined actual nutrient intake of stu-


The objective of the study was to ascertain if children who are eligible for free meals are more in need of the benefits of the NSLP than students who are not eligible for free meals. About one-third of the children eligible for free meals were considered poorly nourished based on results of anthropometric, biochemical, and dietary measures. The writers pointed out that economic need was not necessarily an indicator of nutritional need and that many students who were not eligible for free meals were as nutritionally needy as those receiving free meals.


The primary objective of this study was to determine the effect of school nutrition programs on children's nutrient intake over an extended period of time. The nutrient content of meals provided by school and those brought from home were compared. School meals were significantly more nutritious than meals brought from home.


The nutrient content of lunches served to tenth-grade students in 16 schools was determined based on actual food intake, servings and plate waste were weighed. Intake of calories, magnesium, iodine, iron, and vitamins A, B6, and B12 was less than the one-third of the RDA, although the meals as served met the nutrient requirements. Exploration of ways to increase consumption of the school lunch was recommended.


Nutritional intake, based on the Basic 4 of 54,000 Massachusetts school children was evaluated using 24-hour dietary recalls. On survey day 64% of the children purchased lunch, three-fourths of which were rated as good or satisfactory. For children purchasing at a carte meals, bringing lunch, purchasing lunch in a neighborhood store, or going home, nearly two-thirds of these meals were rated as inadequate. Meals for children from low economic areas were rated as less adequate than were those for children in more affluent areas. Factors that reduced participation included menu choices, food quality, long waits in line, and too short a lunch period.
Abstracts

Food Service Management

Contributed by Penny McConnell, MS, RD, assistant director, Office of Food Services, Fairfax County Public Schools, Springfield, Virginia


Each of us has "comfort zones" in our personal and professional lives. Our comfort zone is the status quo state, where we like things the way they are. These zones adversely impact life when their boundaries prevent us from reaching our potential. Comfort zones, rather than home, work, or societal conditions cause many of the failures in our personal or professional endeavors.

In today's climate of change, the recession and technology are challenging many employees' comfort zones. Comfort zones should be critiqued and appropriate changes made whenever life becomes routine or dull. Fear of failure restricts the desire to risk changes or leave the comfort zone.

Experts suggest strengthening risk-taking behavior by making small changes in daily routines, such as the route to work. Doing so gives confidence and reduces anxiety. Another suggestion is to break a project into phases, allowing confidence to be built as each risk is mastered. It is important to remember that change takes great effort.

Food service managers struggling with operational survival during these difficult times will find that this article forces comfort zone evaluation. The examples used give the reader a better understanding of the "comfort zone" issue. Resources for additional reading also are included.


"Sandwich generation" refers to individuals who have the responsibility of caring for both children and aging parents or relatives. In recent years, more and more couples who have postponed parenthood until later in life are finding themselves in the sandwich generation. In turn, this phenomenon is having a major impact on employers. Employees who are "sandwiched" are exhibiting increased tardiness, absenteeism, and telephone usage for personal business, as well as decreased productivity. The financial losses to employers are great, especially if the worker is experiencing both child- and elder-care problems.

Results of surveys indicate approximately 40 percent of the American workforce are in the sandwich generation. Experts anticipate that this percentage will rise as longevity increases. In addition to work related problems, the sandwich generation is experiencing physical and emotional stress, fatigue, depression, and greater incidence of dysfunction.

To date, only a few large corporations have offered support to their sandwich generation employees. Companies such as IBM and Bank of America have established programs that include flexible work hours, job sharing, on-site child care, elder-care referral services, and luncheon seminars on handling child- and elder-care concerns. In addition to assistance programs, employers need to train supervisors to be sensitive to subordinates who are experiencing sandwich generation stresses.


Despite increased responsibilities, many managers continue to fail to delegate tasks to their staff. "No one can do it as well as I can" and the insecurity of giving up some authority are common excuses used by managers who fail to delegate. Previous success of delegation efforts and the abilities of subordinates influence the decision to delegate.

The secret to successful delegation is the willingness of the manager to give authority appropriate to the delegated task. The author suggested that managers consider the following guidelines when delegating a total project:

- Provide employees with explicit expectations of what the outcome should be and when it is required.
- Explain to employees how the delegated activity relates to the overall goal of the department.
- Develop a feedback loop to be sure guidance is available; decide whether or not regular progress meetings will be held.
- Establish a tickler file as a reminder of who is responsible for which task.

Managers must remember to give subordinates the authority that goes with the delegated task and the responsibility for results. The ultimate reasons for delegation should be the professional development of the staff and increasing one's time to perform other responsibilities. Managers should remember to compliment subordinates on a job well done. Doing so will enhance subordinates' willingness to accept delegated assignments in the future.


Job descriptions are valuable tools in the recruitment, selection, training, supervision, and performance evaluation of employees. However, with the passage of the Americans with Disabilities Act, job descriptions may play an important role in future employment discrimination cases.

This article takes the reader through the process of writing job descriptions. Job descriptions should include the following elements:

- Job identification: job title, department, title of supervisor, prepared or revised, and names of preparer and approver.
- Job summary: general purpose of the position.
- Essential functions: listing of responsibilities, job duties, and major tasks, with percentage of time spent
per task included.
• Accountability: results expected from the job.
• Qualification standards: skill; experience; education; and physical, mental, safety, and other requirements.

Examples are included for the supervisor who has limited experience in writing job descriptions.

Job descriptions should be specific, written in simple language, discuss physical demands such as lifting, and list only job-related qualifications. The new law prohibits discrimination against qualified individuals with a disability who, with or without reasonable accommodation, can perform the essential functions of a job. Employers must be certain that the descriptions are well written and tailored to the actual job to avoid any misunderstandings.


Service management is a new term that has surfaced in professions. In this time of tough economics and international trade conflicts, Americans are being told that their service, product quality, productivity, and pride in workmanship are lower than their competitors. Some experts believe that service and product quality are two very separate issues and should be managed differently. This is contrary to how total quality assurance advocates view quality product and service. Some market researchers maintain product quality and service quality must be controlled by different methods and management approaches. Product quality is measured by how well the end product meets the specifications as determined by customers’ wants. Every customer’s service expectation is personal, however. The following five issues are critical in managing service delivery:
• Customer retention is essential if service companies are to be financially successful.
• Customer-driven service measurement tools that will result in customer retention, rather than just customer satisfaction, must be developed.
• The hiring, training, and support of front-line personnel is the key to a successful service organization.
• Methods to manage customers’ service expectations should be established. For example, Disneyland uses variety of methods to decrease customer awareness of the time spent waiting in line.
• Managers must be trained to be good “service-oriented” role models for their staff.

This article describes a new approach to the important subject of quality service. In addition, the author has provided a table that enables the reader to better understand the characteristics that distinguish products from services.


In an attempt to increase sales and add a spark to business, food service operators are putting their efforts into a variety of promotional programs. Successful promotions require cooperative collaboration between marketing personnel and food service staff. The former create the ideas and guidelines, but the latter are the key to the success of the program because they implement the event.

This article describes some successful promotions in different types of food service. The best way to instill excitement, train personnel, and increase sales was to “trial run” the promotion with the staff. This offers the opportunity to refine procedures and get employee feedback. If costs and time permit, refreshments can be offered at the planning meetings to enable employees to develop camaraderie and enthusiasm. Managers also are given an opportunity to discover the creative skills of employees who make special decorations for the promotion.

In a school setting, promotions are more exciting if the total school—faculty, students, and food service personnel—are involved in the promotion. Different groups can take over the responsibility for different aspects of the promotional theme. For example, students can decorate the dining room while food service staff decorate the serving line. Such total involvement can bring excitement to the entire campus and make the cafeteria a positive part of the school. If possible, photographs should be taken to help refine future promotions. By involving students and staff, the promotion may be expanded to include additional ideas such as costumes or theme music.

Suggestions for involving employees in promotions include empowering the staff by soliciting their suggestions; planning a tasting party to test special menu items; avoiding requirements that certain aspects of the promotion be mandatory, such as costumes; setting goals for the promotion and informing the staff; and involving all employees in the promotion.

Employee Training and Adult Education

Contributed by Jeanette C. Phillips, EdD, LD, and Beth F. King, MLS, MA, assistant executive director and coordinator of clearinghouse, respectively, National Food Service Management Institute, University of Mississippi


The trend in America, according to Arthur M. Schlesinger, Jr., in The Disuniting of America, is not towards the assimilation of diverse groups of people into a national melting pot. Rather, it is towards ethnicity—the celebration and exaggeration of differences in our ancestries and identities.

R. Roosevelt Thomas, president of the American Institute for Managing Diversity at Morehouse College in Atlanta, suggests that in today’s business world managing diversity means building “systems and a culture that unite different people in a common pursuit without undermining their diversity.” As Thomas notes, managing diversity is not a synonym for affirmative action nor for equal
employment opportunity. Diversity refers not only to differences in race, gender, ethnic background or disabilities, but also personality types. Thus, everyone is diverse.

Because problems of differences in the workplace can undermine employee productivity and performance, management must create an atmosphere in which everyone can perform to the best of their ability. Pointing the finger of blame is not an effective way to accomplish justice for all. Americans must get out of the cycle of guilt and beyond the belief that people can be bullied into becoming sensitive and kind towards others. Diversity must be regarded as a business rather than a moral issue.

The goal of diversity training is to help people work together more productively. Therefore, valuing differences more than coworkers exchanging lists of pet peeves or dos and don’ts. To manage diversity, people must see each other as individuals with unique strengths and weaknesses. As Thomas states, the purpose is to build an organization that is as effective heterogeneously as it was with a homogeneous workforce.


If we consider the role of training to be trouble-shooting instead of trouble-shooting, we can compare the training department to a factory control room. The job of control room operators is to identify flaws in equipment, materials, or operator functioning and then act expeditiously to eliminate the problem. Their job is not to put out fires but to prevent hot spots from erupting into fires.

The control room gets a total picture of what is happening in the operation, gathering feedback from all parts of the building. Everyone helps in information gathering, and the information web changes as needed. In a similar manner, deliverers of training should have the total picture of the operation. However, they traditionally have used only one tool—the needs analysis. Other tools that could provide a better overall picture of the operation are the performance appraisal system and internal reports describing individual departments. In addition, every training class offers information in the form of trainees' questions and course evaluation sheets.

An effective factory control room is able to respond immediately. It must have up-to-date information and personnel capable of acting swiftly and appropriately. In similar manner, the training operation should have timely data (predictive would be better) and enough know-how and experience to act quickly and intelligently in diagnosing performance problems and designing and delivering good instruction.

After the control room operators have taken action, they need to assess the way that the situation was handled. The trainer also needs to follow up to see if the training solution met the need. Perhaps a policy or procedure change was needed rather than training.

The training control room analogy gives training a critical role in the organization. Trainers have the opportunity, obligation, and excitement of keeping operations running smoothly.


According to Drucker, the single greatest challenge facing managers in the developed countries is to increase the productivity of knowledge and service workers. Meeting this challenge must be the chief economic priority for developed countries; raising the productivity of service workers, however, will be the most pressing social challenge.

Although knowledge and service workers range from research scientists to part-time fast-food cooks, their jobs are similar in what works and what does not work in raising productivity. In service industries capital cannot be substituted for labor; nor will the use of new technology by itself generate higher productivity. Capital and technology are tools of production in knowledge and service work and may not necessarily save labor.

Increases in productivity come from “working smarter,” i.e., working more productively without working harder or longer. Working smarter is the only key in knowledge and service work. The first component in increasing productivity by working smarter is defining the task and eliminating what does not need to be done. Questions to ask are “What is the task?” “What are we trying to accomplish?” and “Why do it at all?” The second component is to concentrate the work on the task and ask “What do we pay
for?” and “What value is this job supposed to add?”

Defining performance is the third component. Performance definitions vary according to the type of knowledge and service work conducted. For example, in some jobs performance means quality, whereas in others quality and quantity together constitute performance. Finally, some jobs are defined largely by quantity; these are “production” jobs, which require that standards be built into the work processes. The types of questions one should ask to improve productivity varies with the performance definition. Operations should be reassessed every three to five years and whenever work or the organization changes.

In the fourth component, management works closely with the people who hold the jobs. Employees know a great deal about their work; asking them for input is the way to address productivity and quality.

The final component of working smarter has two parts: continuous learning must accompany productivity gains, and knowledge workers and service workers learn most when they teach. Every enterprise has to become both a learning and a teaching institution.


In the mid-1980s Federal Express explored ways to provide customer-contact employees with up-to-date job information, to assure that they learned the information, and to pay them for their job knowledge. Although employees received extensive training before beginning their jobs, the job curriculum was constantly changing. The training needed to be timely and consistent. The Human Resources Development (HRD) Department researched interactive video technology as a possible solution.

The interactive video training developed consists of 25 disks covering a variety of subjects. The disks are updated every six weeks to reflect job curriculum changes. The equipment is set up in a conference room with a key operator available to provide additional information. Self-explanatory resource guides also are available. Explicit step-by-step instructions describe how to use the equipment. This approach, which has made training easy and convenient for employees, allows for individualized training, provides consistency in training, and is economical.

Federal Express took advantage of its computer network to determine employees’ knowledge. Each customer-contact employee must take a computerized job knowledge test every six months. The test begins with questions in the middle range of difficulty and moves up or down depending on employee responses. At the end of the testing period the employee receives a test score report and a student prescription. The prescription points out where to go in the interactive video training to find additional information. Employees who do not pass the test must repeat the training and pass the test before they return to their jobs. Data from test analysis help the HRD Department determine training weaknesses. Good test scores and performance evaluations are criteria for pay increases. The experience of Federal Express with interactive video training and job knowledge testing has been so successful that plans have been made to extend the program to other areas of the company.

Nutrition and Nutrition Education

Contributed by Kathleen Yadrick, PhD, RD, assistant professor, School of Home Economics, University of Southern Mississippi.


Healthy People 2000 is a national initiative for health promotion and disease prevention. Nutrition is one of the 22 areas of high public health priority reviewed in the document, with 21 specific objectives included in the nutrition priority area. The following objectives have implications, either directly or indirectly, for child nutrition programs:

- 2.4 Reduce growth retardation among low-income children aged 5 years and younger to less than 10%.
- 2.5 Reduce dietary fat intake to an average of 30% of energy or less and average saturated fat intake to less than 10% of energy among people aged 2 years and older.


The author suggested the following to help speakers overcome some of the barriers they build for themselves:

- Presenters who find it difficult to create an enthusiastic “presentation presence” should allow themselves to be forceful. They should seek to be more lively and expressive, conveying enthusiasm for the subject to their audience. Instead of focusing on delivery, they should concentrate on making sure that the audience receives the intended message.
- A presenter who assumes the audience is predisposed to a different viewpoint may give up believing that they cannot be persuaded. A sincere, enthusiastic presentation may win them over.
- Presenters who feel pressured when speaking to groups of superiors may benefit from imagining them in pajamas. The audience will not seem as intimidating when dressed that way.
- Those who fear making a mistake should acknowledge that mistakes are possible and instead focus on delivering the presentation.

Presenters who have broken down their protective barriers may feel anxious and vulnerable. One way to lessen this anxiety is to concentrate on the audience instead of worrying about oneself. Another technique is to envision oneself embracing the whole audience in one’s space.
2.7 Increase to at least 50% the proportion of overweight people aged 12 years and older who have adopted sound dietary practices combined with regular physical activity to attain an appropriate body weight.

2.8 Increase calcium intake so at least 50% of youth aged 12 through 24 years...consume three or more servings daily of foods rich in calcium...

2.17 Increase to at least 90% the proportion of school lunch and breakfast services and at least 50% of child-care food services with menus that are consistent with the nutrition principles in the Dietary Guidelines for Americans.

2.19 Increase to at least 75% the proportion of the nation’s schools that provide nutrition education from preschool through grade 12, preferably as part of quality school health education.


National Cholesterol Education Program (NCEP) guidelines recommend that all healthy individuals over the age of two consume a diet that includes no more than 30% of total energy from fat, less than 10% of energy from saturated fat, and less than 300 mg dietary cholesterol per day. In this study, researchers used computer modeling to identify dietary alterations that would meet NCEP guidelines.

Baseline menus were developed for men and for nonpregnant, nonlactating women using nutrient intake data from the Continuing Survey of Food Intakes by Individuals, with 36% of energy from fat for men and 37% for women. Menus were then modified by computer using a variety of strategies that involved replacement of higher fat menu items with lower fat ones. Strategies included replacement of higher fat meat exchanges with medium-fat or lean meat exchanges, use of fat modified dressings, sauces and spreads, and replacement of whole milk with 2% milk. For women, a combination of two or more menu modifications was required to achieve recommended levels of fat and cholesterol intake. A single strategy of replacement of higher fat meat exchanges with lean meat exchanges was successful; for men, however, combinations of strategies also yielded diets containing recommended levels of fat and cholesterol.

The authors concluded the typical American diet can be modified to conform to current dietary recommendations by using a variety of relatively simple, practical changes.


The American Dietetic Association (ADA) has adopted a position regarding the sale of competitive foods in schools. ADA recommends that "foods made available to students during the school day contribute to meeting their nutrition needs and to the development of eating habits consistent with the Dietary Guidelines for Americans."

Current trends that encourage the sale of individual food items in school snack bars, stores, and vending machines threaten both the financial integrity and the nutritional quality of school lunch and breakfast programs. Such sales decrease participation in school nutrition programs and divert income that is important for their viability. Sale of foods and minimal nutritional value in the school setting is not in keeping with goals of comprehensive health education curricula and is a deterrent to achieving the nutrition objectives of Healthy People 2000. Removing competitive foods of little nutritional value from schools would demonstrate the value placed on nutrition and encourage students to make healthy food choices.

In the face of inadequate federal statutes regulating competitive foods, some states and local school districts have taken action to limit the sale of foods of minimal nutritional value. These actions include statute prohibiting the sale of competitive foods until after the lunch period, the specification that only components of reimbursable school meals may be sold a la carte foods, and the development of nutrition guidelines for the sale of all foods and beverages sold on campuses by the state department of education.

Schools that have a responsibility to provide nutritious meals to all children in a setting that encourages wise food choices have an important role in achieving the goals of Healthy People 2000. With the growing pressures of shrinking budgets and increased instructional demands, it is imperative that all those concerned with the integrity of school nutrition programs work together to advance nutrition goals and program effectiveness. Local groups composed of educators, parents, dietetics professionals/nutritionists, and others can raise the community's awareness of the impact of school nutrition programs on student health and quality of life. At the state level these individuals can work to implement policies that support local efforts and address the financial constraints hindering local school environments.


Problems associated with feeding are common in children and may occur more frequently in children with developmental or medical disorders. Assessment of problems associated with eating and mealtime has been highly variable due to the variety of disciplines involved and the absence of a standardized assessment instrument. The purpose of this research was to establish the reliability and validity of the Children's Eating Behavior Inventory (CEBI), a parent report instrument designed to assess problems associated with eating and mealtime across a broad age span and in a wide variety of medical and developmental disabilities.

The CEBI contains 40 items grouped in two domains. Those items in the child domain assess food preferences, motor skills, and behavioral compliance. Those in the parent domain assess parental child behavior controls, cognitions and feelings about one's child, and interactions between family members. The instrument was administered to 110 mothers of children receiving care at outpatient pediatric and mental health clinics (clinic) and 206 parents of normally developing children recruited through community family physicians' offices (nonclinic).

Test-retest and internal reliability testing indicated the CEBI meets criteria for reliability. Construct validity was demonstrated by the significant difference in the number of eating problems in the clinic group compared to the non-clinic group. The instrument offers potential for use in screening for feeding problems, as well as for assessment of the type and severity of problems.

This interventional study examined the effects of classroom health education, vigorous physical education, and modification of school lunch menus on students’ diet and physical activity behavior at school. The Go For Health (GFI) program was implemented in two Texas elementary schools, with two schools in the same district serving as controls. GFI included three components: a classroom health curriculum intended to teach knowledge and skills essential for making lifelong changes in diet and physical activity; a school lunch component that emphasized decreasing fat and sodium through changes in food purchasing, menus, recipes, and food preparation techniques; and a physical education component that emphasized increased physical activity through use of cardiovascular fitness activities.

In the two intervention schools, fat content of lunches decreased 13.5 and 10.3%, saturated fat content decreased 31.7 and 18.8%, and sodium content decreased 55.6 and 40.2% Compared with students in the control group, students in the intervention group reported consuming fewer calories, and less total fat, saturated fat, and sodium on 24-hour recalls. Physical activity in physical education classes increased from less than 10% to about 40% of class time. The authors suggest that schools are a potentially important site for improving children’s diet and physical activity, but that substantial staff training should accompany policy changes affecting school foodservice and physical education programs.


Experts have recommended that health education begin in early childhood. Because health is an abstract concept, it is critical that educators know what children think about nutrition, health, and their relationship to each other so that effective educational strategies can be developed.

The purpose of this study was to describe the health perceptions of young children aged 4 to 7, determine whether food and eating behavior is part of their health perceptions, and evaluate the impact of a home-based nutrition education program on their health perceptions.

Sixty healthy children were divided into treatment and control groups and interviewed about their health perceptions, using both open- and close-ended questions. Children assigned to the treatment group completed a four-week nutrition education program consisting of eight tutorial lessons in audiocassette/picturebook format. Following completion of the treatment, both groups were interviewed again. Pre- and posttest health perception scores were compared by analysis of covariance.

The majority of children in both groups included food and nutrition concepts in their definition of health at pretest, with the treatment group showing an increased perception that health and nutrition were related concepts at posttest. The authors concluded that young children possess the ability to understand abstract concepts related to food, eating behavior, and health and presented recommendations regarding evaluation of health perceptions of children.

Environmental Issues

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This article presents an overview of consumers’ misconceptions about the volume of disposables in municipal solid waste. The impact of such misconceptions on passage of state and local legislation also is discussed. The author delineated the relationship between public health and the use of disposables and illustrated the incidence and cost of foodborne diseases in the United States between 1976 and 1988 with a table. Until recently, epidemiologists generally have not included foodborne illness in the investigation of outbreaks of foodborne illness.

The pros and cons of reusable and disposable serviceware from a sanitation perspective were discussed. Results of a 1989 study in Fairfax, Virginia, were cited, in which approximately one half of the establishments tested were found to have served food on contaminated dishes. The single service items in the same establishments were either negative for bacteria or had total plate counts of less than 10 colonies per utensil. On the average, reusable had greater than 400 colonies per utensil. These results were similar to a previous study conducted in 1983 in Ann Arbor, Michigan. Improper handling or malfunctioning dishwashing equipment were cited as potential causes for high bacterial count. The article concludes with a discussion of the advocacy position of the National Environmental Health Association (NEHA) for continued use of disposable serviceware, especially in hospitals, day-care centers, and nursing homes. Data to support the NEHA position were presented.


Environmental issues predicted to impact the food service industry in the next few years include regulations related to water, air, sewage, toxic materials, and refrigerants. Food service operators will be encouraged to control water usage, monitor emissions into the external environment, pretreat sewage, decrease the amount of toxic cleaning materials used, and replace refrigerants containing chlorofluorocarbons (CFCs) with R-22, a new refrigerant. The author noted that it may be difficult to
obtain service for existing refrigerators as CFCs that were most commonly used are phased out. Disposal of grease also is predicted to be a major challenge for many food service operations. The author discussed the importance of customer education and advocated use of a problem-solving approach to analyze complex environmental problems. Facts rather than emotion then can be used to make decisions.


A review of the history of solid waste management and relevant legislation is presented in this article. Solid waste characteristics are summarized, as are changing consumer attitudes about waste management. Misconceptions regarding waste stream volume, degradability, recycling, and chlorofluorocarbons and ozone damage are also discussed.

Examples of programs, research studies, and new technology for use by food service operators are provided. A table listing the functions, cons, and costs of various types of waste equipment is of particular interest. Readers are reminded of basic points to consider for the following components of a waste handling program: waste handling, security, trash handling, collection charges, and recycling. The author concluded the article by emphasizing the need for a comprehensive program involving households and all industries.


Recycling is the component of integrated waste management programs initiated most frequently by school food service operations. This article, one in a series of six published in the February issue of the Journal, presents an overview of recyclable items used in school cafeterias and successful recycling programs. Approaches and challenges of recycling polystyrene, aluminum, cardboard, milk and juice cartons, and milk pouches are discussed. Examples of successful recycling programs where school food service programs have collaborated with manufacturers and waste management companies are presented. The problems encountered by school districts in maintaining recycling programs and the role of education also are discussed.


The pros and cons of using disposable and permanentware in child nutrition programs are summarized. Benefits identified for use of disposables include conservation of water and electricity, reduced incidence of foodborne illness, and other forms of food contamination, increased versatility and elimination of safety concerns associated with breakage of permanentware. If a recycling program has been implemented, food service disposables will not contribute significantly to the volume of waste sent to the landfill. However, child nutrition programs that have not initiated recycling programs can be expected to experience the negative public image often associated with use of disposables. Waste hauling fees also will be increased.

The author cited the demand for natural resources such as forestland, water, electricity, and petroleum as the primary disadvantage of disposables. Positive aspects of permanentware use include decreased volume of solid waste generated, reduced demand for selected natural resources as raw materials, and enhanced educational value as students are taught how to behave with dishes and utensils similar to those used at home. The strongest argument was the ability to reuse permanentware. Increased concern for sanitation and requirements for water, electricity, and labor were identified as disadvantages. The author noted that the decision to use permanentware or disposables was not black or white. Food service directors have to assess the appropriateness and cost effectiveness of both alternatives for their operations. The following two resources are recommended to assist operators in objectively selecting appropriate serviceware: ‘Model for Evaluating the Cost of Using Reusable Ware Versus Disposable Ware’ developed by the Rochester Institute of Technology for the Foodservice Coalition for a Better Environment, and ‘Solid Waste Solutions for Foodservice Operations’ by the Foodservice & Packaging Institute, Inc.


A survey of the top 50 chains in Restaurant and Institutions’ 1991 400 ranking found that only McDonald’s, Kentucky Fried Chicken (KFC), Domino’s, Dunkin Donuts, and Walt Disney World had departments devoted to managing ecological issues for the corporation. Other companies had delegated the responsibility to operations or purchasing or among several departments. Initiatives in recycling, reduction, reuse, and disposal intended by 37 corporations were presented. Most efforts began with recycling, corrugated cardboard was the material most frequently recycled. The authors noted that environmental efforts had decreased in 1991.

Programs that have been introduced by McDonald’s, Marriott Corporation, Red Lobster, Walt Disney World, Domino’s, KFC, and ARA Services were reviewed. Red Lobster was identified as the chain that has implemented the largest waste reduction program. The corporation was expected to reduce the amount of trash by 4.7 million pounds per year systemwide by replacing paper placemats and napkins with linens. The change to linen was made despite the six-fold increase in cost. Efforts of Subway and International Dairy Queen in reuse of packaging materials and a pilot composting project sponsored by KFC were also discussed.

The authors reviewed the challenges associated with various solid wastes as well as the pros and cons of marketing environmental initiatives. Unfortunately, commitment to environmentalism has not been demonstrated by participation in food service-sponsored recycling efforts. Carl’s Jr. discontinued a pilot paper and plastic recycling program in its dining rooms when faced with irregular customer cooperation. The authors concluded the article by urging immediate use of centralized efforts to prepare for future ecological legislation.
Computer Applications

Contributed by Radesh Rao Palakurthi and Frederick J. DeMicco, PhD, RD
graduate assistant and professor-in-charge of the Graduate Program, respectively, in the School of Hotel, Restaurant, and Recreation Management at The Pennsylvania State University


Buying a computer can become very complicated because of the many options available today. A good place to start would be to first decide on the software that is most appropriate for the needs of the user, and then buy the hardware that works best with the software. In this article, the author explained in lay terms some of the main computer jargon that a potential buyer would need to know in order to make a more educated hardware buying decision. Some of the key terms covered include: Central Processing Unit (CPU), Random Access Memory (RAM), Read Only Memory (ROM), disk storage, monitors, and printers. The author, who recommends looking into such aspects as manufacturer warranties and long-term maintenance costs, also provides a useful nine-point hardware buying guide.


With the advent of nutritional analysis software, menu planning has become much easier and more flexible. It is now possible to develop an entirely new set of menus and have up-to-the-minute printouts that would give the percentage of the recommended dietary allowances (RDAs) met by each menu or menu item. The trend towards nutrition calculation assures that menu nutritional analysis will be a major component of food service operations in the '90s.

In 1989, federal and state regulations drastically revised the RDAs for certain age groups of the population. A survey of nutritional software vendors in 1990 showed that only 75% were using the updated RDAs, however. This article offers tips on selecting the right software for a food service establishment, not only to satisfy applicable federal and state regulations but also to increase operational efficiency. For example, buying software that is already equipped with a recipe, menu, and inventory database would save a lot of time for the user, who would otherwise have to input the data. Alternatively, an agreement could be made with the software supplier to enter the data.


This article describes Pizza Hut, Inc.'s on-site, multimedia training program: "Automated Restaurant Management Systems" (ARMS). ARMS was developed as a new labor management application for its restaurant managers. The application is UNIX-based and benefits managers by helping project sales, forecasting how much food and supplies to order for a given period of the year based on the previous years' data and furnishing information that can create efficient labor schedules.

Because ARMS is a complex system to learn or teach, Pizza Hut's technical training team decided against the usual method of having the restaurant managers attend classroom lectures. Multimedia training was chosen because classroom sessions would be costly and interfere with the managers responsibilities at the restaurants. Trainees who were tested on the new system completed their training on time and produced the required ARMS output without error. An added benefit to the multimedia approach is that Pizza Hut is now more equipped to determine training competency through an on-line certification process.


The author compared six computerized nutrient calculation systems on the basis of ease of use, program functionality, and database characteristics. The article is useful both for its review of current software and databases and for providing a procedure that dietitians can use to evaluate other nutrient—calculation systems. The six programs reviewed were: DINE Windows (Version 3.1), Food Processor II (Version 3.11), Minnesota Nutrition Data Survey (Version 2.2), Nutri-Calc HD (Version 4.11), Nutritionist III (Version 7.0), and Professional Dietitian (Version 1.2). The programs were selected to represent a wide variety of available nutrient system software.

A three-day food record with 73 food items was entered into each of the programs and the nutrient averages compared with the microcomputer version of the U.S. Department of Agriculture Nutrient Data Base for Standard Reference. The six programs were found to vary in cost, size of database, use of non-DSDA data and imputation of data for missing values, number of print/export options, time to analyze data, and overall ease of use. The research study demonstrates that it is important for dietitians to carefully choose dietary analysis systems after first determining their specific needs. The article may be of interest to school food service operations who are contemplating the use of nutrient analysis software.


Tom Neuhaus, a lecturer at Cornell University's School of Hotel Administration, envisioned a graphics-packed computer database that would allow his students to experience virtually all aspects of the culinary arts. The relational database in which the students will be able to view the ingredients, recipes, preparation methods, and the finished dish simultaneously is called Fabulous, an acronym for
Food and Beverage Undergraduate Learning on a UNIX system.

This article briefly explains the development of Fabulous from system selection to implementation. The user-friendly interface to the culinary and pectoral database currently is resident on four UNIX-based SparStation I computers from Sun Microsystems. Fabulous is based on Unify Corporation's database management system running on a network of SparStations. Speed, multitasking, and windowing capabilities were considered to be vital criteria in the selection of the system. Currently, the recipe file contains approximately 200 dishes, including information ranging from preparation time to a difficulty rating for each dish.


This article describes two new automation products, VideoSpecs and DAASH (Data Automated Service Helper), introduced by American Airlines to help expedite service. VideoSpecs is a personal computer-based system that combines catering specifications, purchasing information, recipes, and instructions for meal preparation into a presentation that will allow American to make a complete monthly change in six hours rather than the two weeks to two months currently required. Just eliminating the color photography, paper, printing, and distribution involved in the present menu system will save American $200,000 annually.

DAASH is a point-of-sale system aimed at eliminating the paperwork associated with on-board sales of duty-free products. The primary difference between DAASH and similar systems on the market is that American's flight attendants basically developed it by listing all the features they would like the system to have, such as a back-lit, user-friendly screen and the ability to validate a credit card automatically. Both systems are expected to be available for sale in the not-too-distant future.


In this article, the author emphasized the need to use specific software for off-premise and catering services. Restaurant managers that supplement revenues by catering or providing services off-premise quickly become aware of new challenges. The many details involved in the proposal, planning, and execution stages of the off-premise catering event make record-keeping software invaluable. Many of the files created through catering software packages also can be used to perform functions similar to traditional restaurant management applications.

Restaurant performance traditionally has been evaluated based upon customer turnover and average check. Such single-dimensional analysis becomes problematic, however, because a change in one factor is likely to cause a dysfunctional change in the other. The author suggested that yield management software, based on the concept of supply and demand, is more suitable for restaurant performance measurement. Computer modeling for catering and off-premise service thus should possess tremendous revenue potential in the near future. Such software may have relevant applications to school food service operations who plan to increase their catering activity.

### Food Safety

Contributed by Lucy McProud, PhD, RD, professor and chair of the Department of Nutrition and Food Science, San Jose University


Losses due to microbial spoilage of fresh produce have been estimated as high as 30%. Between harvest and consumption, losses occur at every stage of handling. New interest in processes for disinfection of produce has developed with the discovery that Listeria monocytogenes, Yersinia enterocolitica, and Aeromonas species are capable of growth at refrigeration temperatures and can cause gastroenteritis.

This article reviews advantages and disadvantages of various methods of preservation and disinfection. For example, chlorine washes reduce, but do not eliminate, viable microorganisms. Modified atmosphere storage and aging of produce preserve quality by retarding growth of microorganisms. Ozone and gamma irradiation kill microorganisms, but may have a negative effect on sensory quality. Natural antimicrobial compounds, such as the phytotoxins found in carrot and other vegetable juices, are being investigated as potential produce disinfectants. The method selected for disinfecting fresh produce depends on the type of fruit or vegetable, processing conditions, and desired shelf life.


Shelf life refers to the useful storage life of a food. Evaluating a food's microbial growth requirements (temperature, moisture, acidity, nutrients, and time) can assist in determining its potential for storage. This article reviews the variables that must be considered in shelf life experimentation.

Laboratory organoleptic analysis can be used for shelf life determination, but consumer assessment of taste, odor, and appearance changes varies greatly. Usually organoleptic changes are not detectable until the number of microorganisms is high. Generally, 10,000,000 bacteria per gram, 100,000 yeast per gram, or visible mold are used to estimate the end of microbiological shelf life.

Storage temperature usually predicts the length of microbiological shelf life, as temperature increases, microbial growth rate increases. Even small changes in storage temperature can affect shelf life, making it the difference between a desirable length of storage and premature deterioration of a food item. Experimental shelf life studies are
required whenever changes in ingredients, processing, packaging, or storage occur.


This paper, a scientific status summary by the Institute of Food Technologists' Expert Panel on Food Safety and Nutrition, discusses the role of federal, state, and local governments in protecting the public against hazards related to the food supply. The interplay of science and societal considerations involved in food safety policy making is also discussed. Review of the evolution of legislation related to food and definition of such terms as hazard, risk, and safety are provided.

Determination of the safety of the food supply requires scientific assessment of risk, as well as judgment regarding the social acceptability of the risk. Scientists rank foodborne illnesses and nutritional imbalances as major food-related risks to health. The public, however, perceives environmental contamination, pesticide residues, and use of drugs and hormones in animal production as greater health risks. Inappropriate, expensive, and unproductive public choices may result from misunderstanding of risk/benefit issues. Advances in analytical techniques allow scientists to detect substances at parts per trillion, but the extrapolation of human health risks from animal studies is much less precise. Public policymakers will have the responsibility of reconciling societal and scientific issues in regulating the safety of the national food supply.


This article discusses the history of Hazard Analysis and Critical Control Points (HACCP) from its origin in the chemical processing industry in Great Britain more than 40 years ago. Hazard analysis was adopted by NASA in the late 1960s to minimize foodborne illness of space crews. The contractor for space food production was the Pillsbury Company, which expanded the HACCP concept in-house to minimize liability in the manufacturing of food. The author pointed out the flaws in the premise that one to four FDA inspections per year or the USDA's continual process inspection program guarantees food safety. Snyder further stated that Statistical Process Control (SPC) technology dictates that one does not control by sampling the output of a process. Employees have the actual control of the process and can thereby ensure zero performance errors. HACCP must be a part of an organization's Total Quality Management (TQM) program enforced by top management, which has as its goal zero defects in quality and safety. Components of a TQM program include quality control, quality assurance, and quality improvement.


The purpose of the article was to discuss advantages and disadvantages of four techniques used by regulatory agencies to safeguard food served in a food service establishment. The preparation of Chinese-style fried rice was examined because it contains potentially hazardous ingredients. The traditional snapshot inspection indicates potential areas of food contamination in the operation by noting violations through a dement system. The Hazard Analysis Critical Control Point (HACCP) technique audits when and how hazards occur. HACCP notes growth curves of pathogenic microorganisms from receiving to service. The Sanitary Assessment of Food Environment (S.A.F.E.) procedure obtains information on what has to be done to reduce the incidence of foodborne illness. S.A.F.E. stresses the relation of the preparation cycle to bacterial contamination and growth for a specific menu item, emphasizing a quality product as well as foodborne illness prevention. The Self Care Action Program (SCAF) focuses on preventative factors related to food safety, in addition to promotion and intervention intended to improve the customer's food intake, health, and well-being. The SCAF technique attempts to resolve faulty food-handling practices, abuses, and waste through effective supervision and training. The traditional inspection, HACCP, and S.A.F.E. methods are valuable in identifying disease prevention. SCAF also encourages the customer to make menu choices for better health and fitness.
Current Resources

Book Reviews


*When Food Is Love* explores the relationship between eating and intimacy. It is not a typical self-help book; the information is revealed in the storytelling. Roth's previous books were about the process of resolving compulsive behavior. This one is about “engaging deeply with oneself and others and opening your heart to love.”

The book, which provides insight into why compulsive eaters avoid intimacy, reads easy. Stories from the author’s life of growing up with a physically abusive and addictive mother and an emotionally unavailable father, as well as current personal and professional relationships, are used.

The text contains an introduction and nine chapters, each dealing with major issues associated with compulsive eating and love. The main thrust of the book is that diets fall because food and weight are only symptoms, not the problem. People abuse themselves with food because they do not know they deserve better. The focus on food provides a distraction from underlying issues of trust and intimacy.

A synopsis of selected chapters follows:

- **“When Food is Love”—**The purpose of compulsive eating is to protect ourselves from the pain associated with love.
- **“Being In and Out of Control”—**The issue of control is central to compulsive eating. When we become intimate, we lose control and become vulnerable to loss, pain, and death.
- **“The Comfort of Struggling”—**Chaos, intensity, and drama are “normal” to compulsive eaters and protect them from being intimate.
- **“The One-Wrong-Move Syndrome”—**When we grow up believing that we are loved because of what we do rather than who we are, our survival depends on doing the right thing.
- **“Being a Victim, Being Powerful”—**As children we are not to blame for what happened to us, but we are responsible for what we do with our pain as adults.

This book is recommended for adults who are compulsive eaters and have challenges in maintaining loving relationships, as well as for those who love compulsive eaters. The text does include some profanity and many of the relationships described are unhealthy, as one would expect. Dietitians, health professionals, or school food service personnel also could benefit from gaining an understanding of why people who are compulsive eaters make wrong choices when it comes to relationships.

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The increasingly competitive nature of the marketplace today offers both a threat and an opportunity to service industries facing dramatic environmental changes. In the preface of *Services Marketing*, Loveland states his theme is that because service organizations differ in several important ways from manufacturing businesses, a distinctive approach is required for planning and implementing marketing strategy. The author stresses the importance of understanding service organizations on their own terms and then tailoring marketing goals and strategies accordingly.

The book is organized into four parts: understanding services, strategic issues, tools for service marketers, and challenges for senior management. Each part includes two or more chapters, followed by reprints of articles written by other authors and cases that cover different industries and marketing situations. There are a total of 12 chapters, 14 readings and 18 cases. Most chapters end with a conclusion or summary and are followed by a list of pertinent references or endnotes. Also included is an appendix titled "Studying and Learning from Cases," a selected bibliography, and an index of both the chapters and readings.

Loveland acknowledges that the services marketing function is much broader than just the activities and output of the traditional marketing department. In this book he attempts to integrate three perspectives of marketing: a strategic thrust pursued by top management, a set of functional activities performed by line management (e.g., product policy, pricing, delivery, and communications efforts); and a customer-driven orientation for the entire organization.

Loveland is a teacher, author, and consultant with extensive experience in service businesses. Readers will find this book organized, easy to read, and well illustrated. Food service educators could use this book for teaching marketing in undergraduate and graduate classes or in workshops for school food service practitioners. For example, Chapter 11, "Improving Service Quality and Productivity," could be combined with the reading "Communication and Control Processes in the Delivery of Service Quality" and the case "Domino's Pizza: A Deadly Delivery Problem" for a theory with application, teaching/learning situation. In addition to educators, Services Marketing is highly recommended for those working in management positions in nonprofit organizations such as school food services, school boards, state agencies, and professional associations.

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*Kitchen Fun for Kids*, subtitled "Healthy Recipes and Nutrition Facts for 7 to 12 Year Old Cooks," is a recipe book designed to introduce kids not only to the kitchen, but also to healthy eating. The authors' first goal, to provide healthy recipes, is met more successfully than their second, which is to convey nutrition facts. Fifty-five recipes are provided in five sections: breakfast, lunch, supper, desserts, and snacks and beverages. Each recipe is identified by level of difficulty as...
“rookie,” “intermediate,” or “master.” The recipes call for fresh, minimally processed, low-salt, low-fat ingredients. The two-page format for each recipe includes necessary tools and ingredients as well as clearly stated directions. Also included are a short “fun” description to interest readers in preparing the recipe, a nutritional analysis per serving, and an illustrated nutrition message. The nutritional analysis includes calories, total fat, saturated fat, sodium, and cholesterol. The illustrated nutrition messages are primarily related to fat, sodium, and sugar. In addition, some attention is given to vitamins, minerals, and fiber. One message relates to safe food-handling procedures.

A section titled “Before You Begin” includes basic kitchen safety rules and simple directions for preparation tasks required by the recipes. A short introduction to the kitchen encourages children to have an adult partner for their first few culinary experiences and provides tips for organizing and cleaning up.

The preface for parents offers a good overview of the purpose of the book and encourages parents to join their children in the kitchen. It also speaks well of the pleasures related to cooking and to eating.

Although the introduction has many good points, “good-bad” terminology is used. One section is titled “Good Guys and Bad Guys,” and while the authors stop short of calling foods “good” or “bad,” most children probably will associate those terms with particular foods. Fat, saturated fat, sodium, and cholesterol are labeled “bad guys.” Protein, starch, fiber, vitamins, and minerals are labeled “good guys.” Throughout the book, the former group receives more attention than the latter.

“Tricks to Help You” provides effective messages, such as eat less fat, fewer chips, etc. The general tone of the book, however, promotes fear of food, which is inappropriate for children. Replacement of phrases such as “fat, sugar, and other bad stuff” with ones that promote variety, balance, and moderation would improve the book.

*Kitchen Fun for Kids* will be a valuable resource to parents and children who share the authors’ and the Center for Science in the Public Interest’s (CSPI) Spartan opinions on eating. An understanding of the CSPI viewpoint can be of value to school food service directors who must balance the preferences of a variety of customers to insure the needs of all students are met.

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Paperback, 324 pp. ($13.95).

*A Healthy Head Start* approaches early childhood feeding with practical suggestions that turn information into action. Sound nutrition information, imaginative methods, and proven recipes are provided through collaborative efforts of Hunt, a health and nutrition writer; Hess, a registered dietitian; and Stone, an excellent cook and recipe developer. Focusing on the latest research, the authors dispel misinformation by relating nutrition topics to developmental stages for children ages one to five years. Readers are advised to seek assistance from physicians and registered dietitians for meeting the individual needs of children. Calorie, protein, carbohydrate, fat, vitamin, and mineral needs of the general preschool population are reviewed to help parents and other caregivers see the relationship of nutrition to optimum social, physical, and emotional development. Readers are motivated to provide food in a stimulating environment as a means of creating positive, lifelong food habits.

A food group plan offers guidance in providing youngsters the opportunity to consume a well-balanced diet. Food groups feature best, second best, and “other” choices for selection of foods for menu planning. Food group subheadings, such as “used moderately” and “used occasionally,” assist the reader in using a variety of foods. The “What You May Not Know” section of each food group provides key points for menu planning and feeding young children.

The authors stimulate readers with comments regarding the reactions of their own children to situations, foods, and recipes. Stone’s experiences with her first child inspired the creation of many Healthy Head Start Recipes. These recipes, which are arranged categorically, often are prefaced with nutritional points and serving tips.

The text contains 324 pages, including the index. *A Healthy Head Start* is an excellent guide for parents and caregivers for understanding and applying sound nutrition practices to the feeding of preschoolers. This book also would serve as a valuable resource for school food service directors and managers responsible for planning and serving meals for preschool programs. As public education opportunities expand to include 3- and 4-year-old children, school food service professionals will need up-to-date information that relates nutritional needs, food habits, and practices to the early stages of child development. Many of the concepts included in the book also have application for developing healthy eating behaviors and environments for young school age children.

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Hardcover, 212 pp. ($40.00 for members and $50.00 for nonmembers, plus $3.75 shipping and handling).

*Professional Procurement Practices: A Guide for Dietary Managers* is based on a manuscript developed by Jack D. Ninemeier, PhD, professor in the School of Hotel, Restaurant and Institutional Management at Michigan State University. The stated objective of the Guide is to provide information for improving the quality and cost effectiveness of dietary operations being managed.

The 16-chapter text is divided into four parts, each with an introductory paragraph in which dietary managers are told what they will learn in the ensuing chapters. In Part I, “What is Purchasing?,” an introduction and overview of the procurement process is discussed. The job description for dietary managers in small facilities, who must combine purchasing with other management duties, is seldom found in other purchasing texts. Part II, “Achieving Purchasing Goals,” includes discussions of purchasing specifications, purchasing the “right” quantity at the “right” price, and
selecting the best supplier. Quality is treated realistically with the statement that quality does not have to be the highest available, but rather that the product should do what it is supposed to do better than any other one. These concepts are applied not only to large food service operations but also to small ones.

Eight chapters in Part III, “Special Purchasing Concerns,” are devoted to the basics of purchasing, the first of which deals with accounting aspects. The source document flow in both large and small facilities is well diagramed. Make-or-buy decisions, security concerns, ethical concerns, legal aspects of purchasing, and evaluation of the purchasing process are discussed in separate chapters. The final two chapters in Part III are “Purchase of Food Products” and “Purchase of Capital Equipment Items.” For each food group (meat, seafood, dairy products, fresh fruits and vegetables, and others), purchase concerns and specification suggestions are included. An overview of purchasing capital equipment is given and the role of the purchasing department, dietary personnel, and top-level administrators in the process is discussed. If, however, information on specific food products and types of equipment is needed, additional resources will be required by the dietary manager.

Effective receiving and storage procedures are reviewed in the two chapters in Part IV, “Receiving and Storage Systems.” Two very important concepts are emphasized in these chapters: food quality can deteriorate rapidly from the time of receiving to issuing and proper recordkeeping and inventory control are essential in a well-organized food service operation. A strength of the text is the information in the appendices. Excellent examples of purchasing forms are included in the first appendix and a training outline for purchasing personnel is in the second.

More precise definitions of procurement and purchasing probably would aid the dietary manager in understanding the relationship and differences between the two terms. Also, the terms process, procedure, and system appear to be used interchangeably, causing confusion in understanding the concepts. Professional Procurement Practices: A Guide for Dietary Managers could be an excellent resource for non-commercial food service managers, including those in school food service involved in the procurement function. The concepts also are general enough to apply to commercial food service operations.

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Anyone in a managerial position today would agree with the author’s premise that “attracting, recruiting, and keeping good people is becoming an increasingly critical challenge.”

The objective of Mr. Herman’s book, clearly presented in its title, is reached through almost 300 suggestion-packed pages.

The book is divided into three sections, with Section One providing a foundation for the chapters that follow. The value of “good people” to any organization is reviewed, along with the need for managerial leadership and the promotion of teamwork in the job setting. The changing demographics of today’s workforce and the increasing competition for good workers also is discussed. A presentation of Maslow’s hierarchy of needs and other theories of motivation provides transition to Section Two, which outlines what the author calls “strategic responses” to the labor crisis.

The balance of Section Two is divided into brief discussions of more than 100 environmental, relationship, task-focused, compensation, and people-growing strategies. Unfortunately, most of these are quite simplistic and offer little new information to the reader. Strategies such as “insist on workplace safety” (environmental), “show respect for others” (relationship), or “give clear direction” (task-focused) appear to this reviewer to be statements of the obvious. Strategies for compensation and employee development or “people growing” likewise are obvious and uninspired. Although this compilation of suggestions provides little in the way of new or innovative ideas for managers, it is nonetheless a comprehensive recitation of well-known facts related to interpersonal relationships.

The final section of the book provides suggestions for implementing the strategies by involving subordinates, peers, and higher level managers in the organization. Lastly, three appendices are included. A brief overview of the four primary behavioral styles found in individuals is given in Appendix A, with the premise that the more a manager learns about behavior, the more effective he or she will be as a people manager. A short discussion of leadership styles and theories also is provided. Appendix B presents the reader with a discussion of personal and organizational values and their interface with a manager’s personal practices. Self esteem in the cooperative environment is the topic of Appendix C. The reinforcement of self esteem as crucial to keeping employees happy and productive also is discussed.

This book is clearly and simply written and could benefit those new to the supervisory ranks. Although seasoned managers would probably find the text overly simplistic, the take-home message is sound, tried, and true: managers should treat others as they would wish to be treated—a principle with which few can argue.

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Author Nancy Cooper has revised and updated the popular, health-oriented book, The Joy of Snacks. The result is an improved, easy-to-read recipe format with updated educational material and many nutritious and tasty snack recipes. The purpose of the book is to help the reader understand the benefits of snacking and provide guidance in choosing and preparing nutritious snacks.

An attractive cover puts the reader in the mood to think about good food, but the spiral binding found on the previous edition may be more durable. The book contains 13 chapters on food categories and one on convenience foods, providing a generous 234 recipes. Some recipes have been omit-
tled from the earlier edition and replaced with interesting new ones; a helpful index also has been added.

This 285-page book begins by focusing on the healthy implications of nutritious snacking for all age groups. For example, the author explains that children, who often are unable to consume all the healthy foods they need in their daily meals, can increase nutritious caloric intake with the snack recipes found in the book. Adults also may benefit, as blood cholesterol levels may be influenced positively by healthy snacking.

The introduction provides updated information on the number of servings recommended from each food group. Increased intake of complex carbohydrates is emphasized; for example, many whole grain bread and muffin recipes are featured.

Recipes in *The Joy of Snacks* have been developed according to the *Dietary Guidelines for Americans*. Emphasis on nutrition education is apparent, with analysis of major nutrients as well as serving size and food exchange values provided for each recipe. The author points out that all recipes are prepared using ingredients lower in fat than those in traditional recipes, and most recipes contain less than 1 teaspoon of sugar per serving. For example, lowfat dairy products replace high-fat products, polyunsaturated oils substitute for saturated fats, and fruits and juices are used as sweeteners. Nonetheless, half of the recipes have more than 30% of calories from fat; however, nearly all fats are poly- or monounsaturated.

Approximately 18% of the recipes have more than 50% of calories from fat. Discretion would be advised, therefore, when selecting recipes from the “Appetizers, Dips and Spreads,” or “Pies” sections. In the “Dessert” category, however, nearly every selection contained less than 200 calories per serving; 12 of the 23 recipes have less than 30% fat. For the most part, recipes have high nutrient density. Superior ratings go to the “Hearty Snacks,” “Especially for Kids,” “Muffins and Breads,” and “Beverages” categories. This reviewer did find that some recipes fail to yield as specified, however.

Recipe comments given in italics add a friendly touch, but a few appear to be placed on the wrong page. Information on recipe modification and pointers for success are most appreciated. Recipes in the “Especially for Kids” chapter include a “what you need” and “what you do” format; step-by-step directions and safety, sanitation, and success tips make this an excellent chapter for teaching. Most recipes are quick and easy to prepare.

The beverage chapter was particularly impressive, as innovative recipes for “sneaking in” nutritious calories are provided. Blender drinks made with fruit, yogurt and sugar-free soda are tasty alternatives to high-sugar, low-nutrient carbonated beverages.

Nutrition professionals as well as health-oriented cooks will find this book a useful reference. Diabetes educators can use the recipes for instruction, and child nutrition program educators can plan nutritious snacks for classroom presentations. School breakfast and lunch program directors may turn to this edition for recipe ideas, but most recipes will need to be adjusted for large-scale production. In addition, readers should review the nutritional analyses when selecting recipes since not all items are low in fat.

Nutritious snacking can be part of a healthy diet, and *The Joy of Snacks* helps make this important link. As the author states so cheerfully, “Here’s to eating well and living well.”

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NSLP PARTICIPATION

School lunch participation in total continued to increase slowly during the first quarter of fiscal year (FY) 1992, with all of the increase due to growth in participation of those getting their meals free. The number of paid meals and those paying reduced prices are both down about 3% from a year earlier (Table 1). However, these declines were more than offset by a 6% increase in participation of those getting free meals.

These data compare October to December, 1991 and 1992 (Figure 1).

In total, the rate of participation was at 24.7 million during fall 1991 compared with 24.5 million a year earlier. This rate of participation compares with 24.2 million for all of FY 1991. Looking back over the past five years, we see that total lunch participation has been creeping upward (Figure 2). Small increases in free and reduced-price participation have offset a small decline in paid participation.

The increase in free meals this year appears to be associated with the adverse economic situation. Similar increases have been noted for Food Stamp Program participation. In fact, participation in the Food Stamp Program has increased much faster than for free lunches. Participation in food stamps in October to December 1991 averaged 24.5 million, up 15% from October to December 1990 (21.3 million). These food stamp participants represented 9.7 million households in late 1991.

Each October, USDA collects data on the number of schools with programs and the enrollment and rate of participation in these schools. The data for October 1991 are not yet available for distribution at this time (March 1992), but in October 1990, there were nearly 88,000 schools and 4,500 more residential child-care institutions receiving benefits under the National School Lunch Program. Enrollment in these schools totaled 41.6 million, for an average participation rate of 59% for the month. These figures have not changed much for several years.

### Table 1. National School Lunch Program participation*

<table>
<thead>
<tr>
<th>Fiscal Year (Oct.–May and Sep.)</th>
<th>Free</th>
<th>Reduced</th>
<th>Paid</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>10.6</td>
<td>1.9</td>
<td>13.3</td>
<td>25.8</td>
</tr>
<tr>
<td>1982</td>
<td>9.8</td>
<td>1.6</td>
<td>11.5</td>
<td>22.9</td>
</tr>
<tr>
<td>1983</td>
<td>10.3</td>
<td>1.5</td>
<td>11.2</td>
<td>23.0</td>
</tr>
<tr>
<td>1984</td>
<td>10.3</td>
<td>1.5</td>
<td>11.5</td>
<td>23.4</td>
</tr>
<tr>
<td>1985</td>
<td>9.9</td>
<td>1.6</td>
<td>12.1</td>
<td>23.6</td>
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<tr>
<td>1986</td>
<td>10.0</td>
<td>1.6</td>
<td>12.2</td>
<td>23.7</td>
</tr>
<tr>
<td>1987</td>
<td>10.0</td>
<td>1.6</td>
<td>12.4</td>
<td>23.9</td>
</tr>
<tr>
<td>1988</td>
<td>9.8</td>
<td>1.6</td>
<td>12.8</td>
<td>24.2</td>
</tr>
<tr>
<td>1989</td>
<td>9.8</td>
<td>1.6</td>
<td>12.8</td>
<td>24.2</td>
</tr>
<tr>
<td>1990</td>
<td>9.9</td>
<td>1.6</td>
<td>12.6</td>
<td>24.1</td>
</tr>
<tr>
<td>1991</td>
<td>10.3</td>
<td>1.8</td>
<td>12.1</td>
<td>24.2</td>
</tr>
</tbody>
</table>

### Figure 1. NSLP participation (Oct.- Dec., FY 1991-92)

* Average number per day  
** Computed from unrounded data for school years.  
Source: Unpublished data from Food and Nutrition Service as of March 1992
LUNCH PROGRAM COSTS

Federal program reimbursements in FY 1991 totaled $4.2 million, up nearly 10% from FY 1990 (Table 2). During the first quarter of FY 1992, the rate of increase slowed to an increase of 6% due to a slower rate of increase in reimbursement rates this year. The 6% rate of increase, however, much exceeded food price increases because of the upward trend in number of free meals, which earn considerably higher reimbursement rates. Reimbursement rates this year are up 3.2% for Section 4 ($0.16 per meal) and 3.4% ($1.50) for Section 11 payments for free meals.

USDA commodities distributed to schools remained about the same in the first quarter of FY 1992 as a year earlier. Entitlement commodities were down a bit, but bonus commodities were up

Figure 2. NSLP participation (FY 1991-92)

Source: USDA Food and Nutrition Service

Table 2. Federal costs for National School Lunch Program

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Cash Payments</th>
<th>USDA Commodities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Section 4</td>
<td>Section 11</td>
</tr>
<tr>
<td>(Oct.–May and Sep.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>708.7</td>
<td>1,672.4</td>
</tr>
<tr>
<td>1982</td>
<td>421.3</td>
<td>1,764.1</td>
</tr>
<tr>
<td>1983</td>
<td>446.2</td>
<td>1,955.6</td>
</tr>
<tr>
<td>1984</td>
<td>470.9</td>
<td>2,036.8</td>
</tr>
<tr>
<td>1985</td>
<td>497.9</td>
<td>2,080.5</td>
</tr>
<tr>
<td>1986</td>
<td>524.1</td>
<td>2,190.1</td>
</tr>
<tr>
<td>1987</td>
<td>544.0</td>
<td>2,277.5</td>
</tr>
<tr>
<td>1988</td>
<td>574.8</td>
<td>2,332.3</td>
</tr>
<tr>
<td>1989</td>
<td>582.1</td>
<td>2,412.7</td>
</tr>
<tr>
<td>1990</td>
<td>622.3</td>
<td>2,537.9</td>
</tr>
<tr>
<td>1991</td>
<td>658.3</td>
<td>2,666.6</td>
</tr>
</tbody>
</table>

(Oct.–Dec.)

| 1991        | 202.6         | 862.8            | 1,065.3      | 181.9       | 33.5  | 1,280.7     |
| 1992        | 209.9         | 939.1            | 1,149.0      | 173.2       | 39.8  | 1,362.0     |

Percent Change

3.6          8.8          7.9          -4.8        18.9          6.3

Source: Unpublished data from Food and Nutrition Service as of March 1992
some. For FY 1991, entitlement commodities continued to increase in line with legislated rates, at 14.0 cents per meal served. But, bonus commodities declined by about one-half due to the lack of surplus agricultural commodities available for distribution.

Looking at longer term trends, federal support of the lunch program has increased substantially over the past decade (Figure 3). The increase amounted to 28% for total costs, comprising a 71% increase for free meals and contrasted with a 7% decline for paid meals. The data for FY 1991 are compared with FY 1981, just prior to the major cutbacks in the program enacted that year. Despite inflation, Section 4 payments have never regained previous levels. Commodity entitlements topped FY 1981 levels for the first time in FY 1991, but bonus commodities are down by two-thirds. In total, Section 11 payments represent over two-thirds of total program costs (69%) during the first quarter (Figure 4).

**PARTICIPATION AND COST**

Participation under the School Breakfast Program continued its previous growth during the first quarter of FY 1992 (Table 3). Those receiving their
meals free continue to record the largest increases in participation and now account for about 82% of all participants. Their number during the first quarter of 1992 increased by nearly 10% from year-earlier levels.

Paid breakfasts continued to grow, up 5% from a year earlier, but in total they account for only 13% of the meals served. The remaining 5% of the meals are served at reduced price, and this group increased less than 2% from a year earlier.

The largest share of the free breakfasts (about 60%) were classified as being in "severe need." That is, they are served in schools with 60% or more of their lunches qualifying for free or reduced-price reimbursements.

Costs of the School Breakfast Program increased nearly 14% during the first quarter of 1992. Federal program costs in FY 1991 totaled $677 million, which is relatively small (16%) in comparison with the lunch program's total cost of $4.2 billion. However, breakfasts are served to only about one-sixth as many children as are lunches. Reimbursement levels per meal are about the same for the two programs. Over the past decade, costs of the breakfast program have increased sharply as a result of the Federal priority given this program, but the growth rate has not been as large as that for child-care food programs (Figure 5).

CHILD AND ADULT CARE FOOD PROGRAM

Among the child-care segment of the program, food served as a component of day care in homes continues to outgrow that in child-care centers (Figure 6). Both programs are expanding; however. In the first quarter of FY 1992, the number of meals served in day-care homes increased by nearly 12% compared with nearly 5% for child-care centers. Costs increased somewhat faster as a result of the continued increase in reimbursement rates. Overall program costs increased by 11% during the first quarter (Table 4).

Over the past 9 years, federal costs of food service in day-care homes has risen by five times, from $87 million to $472 million to be the larger of the two programs, while costs in child-care centers has increased by 75% to $352 million.

Presently, there is no income or means test for participants in the day-care home program, but funding for meals served at child-care centers is based on incomes of the individuals served. This situation may change in the future. The Bush Administration has proposed some alternative means tests for future meals served in day-care homes, but legislation would be needed to implement such changes.

The average daily attendance at day-care homes totaled 0.7 million in

### Table 3. School Breakfast Program participation and cost

<table>
<thead>
<tr>
<th>Fiscal Year (Oct–May and Sep.)</th>
<th>Participation (average number)</th>
<th>( \text{Total Cost} ) million $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free</td>
<td>Reduced</td>
<td>Paid</td>
</tr>
<tr>
<td>1981</td>
<td>3.05</td>
<td>.25</td>
</tr>
<tr>
<td>1982</td>
<td>2.80</td>
<td>.16</td>
</tr>
<tr>
<td>1983</td>
<td>2.87</td>
<td>.15</td>
</tr>
<tr>
<td>1984</td>
<td>2.91</td>
<td>.15</td>
</tr>
<tr>
<td>1985</td>
<td>2.88</td>
<td>.16</td>
</tr>
<tr>
<td>1986</td>
<td>2.93</td>
<td>.16</td>
</tr>
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<td>1987</td>
<td>3.01</td>
<td>.17</td>
</tr>
<tr>
<td>1988</td>
<td>3.03</td>
<td>.18</td>
</tr>
<tr>
<td>1989</td>
<td>3.11</td>
<td>.20</td>
</tr>
<tr>
<td>1990</td>
<td>3.30</td>
<td>.22</td>
</tr>
<tr>
<td>1991</td>
<td>3.59</td>
<td>.25</td>
</tr>
</tbody>
</table>

| (Oct–Dec) | 
| 1991 | 3.60 | .26 | .59 | 4.44 | 203.4 |
| 1992 | 3.94 | .27 | .61 | 4.82 | 231.4 |

Percent Change 9.6 1.5 5.0 8.5 13.8

Source: Unpublished data from Food and Nutrition Service as of March 1992

### Figure 5. School Breakfast and Child-care program costs (FY 1982-91)

[Graph showing the cost increase for both school breakfast and child-care programs from 1982 to 1991.]

Source: USDA Food and Nutrition Service
December 1991, in comparison with 0.9 million at child-care centers.

The adult-care part of the program continues to grow rapidly. In the first quarter of 1992, the program served 3 million meals, up 28% from the previous year. Total program costs were $3.2 million for the first quarter, up 34%. There were more than 1,100 sites operating. For all of FY 1991, program costs totaled $10.9 million.

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**Figure 6. Meals served in Child and Adult Care Food Program (FY 1982-91)**

![Graph showing meals served in Child and Adult Care Food Program from 1982 to 1991](image)

*Source: USDA Food and Nutrition Service*

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**Table 4. Child and Adult Care Food Program: meals served and federal cost**

<table>
<thead>
<tr>
<th>Fiscal Year (Oct.-Sep.)</th>
<th>Day-Care Homes</th>
<th>Child-Care Centers</th>
<th>Commodities and Cash in Lieu</th>
<th>Total Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Meals</td>
<td>Total Cost</td>
<td>Total Meals</td>
<td>Total Cost</td>
</tr>
<tr>
<td></td>
<td>millions</td>
<td>million $</td>
<td>millions</td>
<td>million dollars</td>
</tr>
<tr>
<td>1982</td>
<td>153.6</td>
<td>87.5</td>
<td>339.1</td>
<td>202.5</td>
</tr>
<tr>
<td>1983</td>
<td>178.2</td>
<td>111.9</td>
<td>358.2</td>
<td>193.4</td>
</tr>
<tr>
<td>1984</td>
<td>217.3</td>
<td>141.2</td>
<td>373.2</td>
<td>205.9</td>
</tr>
<tr>
<td>1985</td>
<td>253.3</td>
<td>171.3</td>
<td>387.1</td>
<td>218.6</td>
</tr>
<tr>
<td>1986</td>
<td>277.1</td>
<td>193.8</td>
<td>401.2</td>
<td>233.5</td>
</tr>
<tr>
<td>1987</td>
<td>309.2</td>
<td>226.2</td>
<td>415.9</td>
<td>249.9</td>
</tr>
<tr>
<td>1988</td>
<td>356.7</td>
<td>270.3</td>
<td>432.7</td>
<td>266.3</td>
</tr>
<tr>
<td>1989</td>
<td>414.2</td>
<td>325.4</td>
<td>447.8</td>
<td>283.3</td>
</tr>
<tr>
<td>1990</td>
<td>482.3</td>
<td>399.1</td>
<td>475.5</td>
<td>313.1</td>
</tr>
<tr>
<td>1991</td>
<td>543.0</td>
<td>472.4</td>
<td>510.0</td>
<td>352.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fiscal Year (Oct.-Dec)</th>
<th>Day-Care Homes</th>
<th>Child-Care Centers</th>
<th>Commodities and Cash in Lieu</th>
<th>Total Cost*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>126.6</td>
<td>106.3</td>
<td>130.0</td>
<td>91.2</td>
</tr>
<tr>
<td>1992</td>
<td>141.1</td>
<td>124.7</td>
<td>136.0</td>
<td>96.9</td>
</tr>
</tbody>
</table>

| Percent Change         | 11.5           | 15.1              | 4.6                         | 6.2         |
|                       | 20.5           |                   |                             | 11.1        |

*Includes sponsor administrative costs, which totaled $66.4 million in FY 1990 and $77.2 million in FY 1991.

*Source: Unpublished data from Food and Nutrition Service as of March 1992*
In the Fall 1991 issue of the School Food Service Research Review, the Food and Nutrition Service's (FNS) Office of Analysis and Evaluation began publishing a continuing series of summaries of recently completed and current FNS work in the area of child nutrition. The summaries provide highlights of new research and educational tools that can be used to improve the nutritional status of children. This issue contains information about recent research and educational tools that can be used to improve the nutritional status of children.

RECENTLY COMPLETED RESEARCH

Child Nutrition Program Operations Study: Year Two Report. This report presents the results of the second year of a three-year study designed to provide a snapshot of school food authority (SFA) operations and an assessment of year-to-year changes in program operations for specific research areas. A telephone survey of SFAs was conducted in the spring of 1990 yielded 1,350 completed interviews for a 78% response rate. Research areas examined included program participation, meal prices and meal costs, issues related to the Food Donation Program operations, Child Nutrition Labeling, and technical assistance.

In addition, the second year of the study included on-site meal observations conducted in 20 SFAs for the purpose of collecting some general information on meals offered to, selected by, and consumed by students participating in the National School Lunch Program (NSLP) and School Breakfast Program (SBP). Two elementary schools and one middle/secondary school were selected within each of the 20 SFAs for a total of 60 schools included in the on-site meal observation study. In each school, meal service was observed for five consecutive days and detailed data were collected on meals offered (meals that were made available to children on the day of observation), meals selected (actual food selections were observed for approximately 60 children at each meal per school), and meals consumed (plate waste was observed for 12 of the 60 selected children at each school). This sample of SFAs was not nationally representative, but provided valuable insight for the School Nutrition Dietary Assessment Study, which will produce national estimates of the nutrient content of U.S. Department of Agriculture (USDA) meals and student dietary intake.

Some of the major findings of the study include:

- The overall student participation in the NSLP remained relatively constant between school year (SY) 1987-88 and SY 1988-89.
- The SBP continues to be available to an increasing number of students. Both the number of SFAs and schools offering the program is increasing.
- The average price charged for a full-price NSLP meal during SY 1989-90 increased $0.02 to $0.03 from the previous year to $0.95 in elementary schools and $1.06 in secondary schools. The average price charged for a full-price SBP meal in SY 1989-90 also increased about $0.02 to $0.50 in elementary schools and $0.52 in secondary schools.
- The average cost of producing a lunch increased about $0.05 to $1.67 in SY 1988-89. The total federal subsidy ($1.66) was about the same as the average reported cost of producing an NSLP lunch and greater than the reported cost of producing a lunch for the average SFA ($1.46).
- Most SFAs rated the overall performance of the commodity distribution system as excellent or very good.
- The Child Nutrition Labeling Program is perceived as an important program and a valuable way of ensuring that processed food products meet USDA meal pattern requirements.
- The average lunches offered and selected in 20 SFAs were nutrient-dense meals supplying one-third or more of the Recommended Dietary Allowances (RDAs) for all nutrients. The average NSLP meals offered and selected exceeded the Dietary Guidelines recommendations for total fat and saturated fat.
- Students do not consume all the foods they select, particularly elementary students. On average, elementary students wasted almost one-fourth of the nutrients contained in the meals they selected while secondary students wasted less than 10% of available nutrients.

The Homeless Shelter Demonstration. This demonstration is currently being conducted to test the feasibility and impact of delivery of year-round food assistance to preschool children below the age of 6 in homeless shelters. The initial phase of this demonstration was initiated in 1990 in four shelters in the Philadelphia area. Additional sites have been added to the demonstration.

The initial evaluation of the first nine months of the demonstration in Philadelphia used a case study methodology and focused on the context for the delivery of child nutrition benefits, how it was implemented in shelters, how many children benefited from the demonstration, and the characteristics of the children served. Data collection included on-site interviews with representatives from the service providers, and the service providers and direct observation of the meal service program in the four demonstration shelters.

Key findings of this demonstration evaluation were:

- In all, 1,110 children participated in the demonstration between May 1990 and March 1991: 363 infants younger than 12 months and 747 children between the age of 12 months and age 6.
- The Average Daily Participation (ADP) for breakfast was 60; the ADP for lunch was 64.
- Although all four shelters provided meals to residents prior to the demonstration, the quality of the meals provided to children younger than age 6 was enhanced, and resources were made available so that the nutritional value of the meals of older children and adults could be improved.
- All shelters reported that more...
fruits and vegetables were served as a result of the demonstration.
- All children received fresh fluid milk at every breakfast and lunch. Prior to
  the demonstration only one of the four shelters provided amounts of milk
  that were compatible with Child and Adult Care Food Program (CACFP)
  meal pattern requirements.
- Shelters reported that they incurred minimal additional expenses
  for the project. No additional staff were needed.

RESEARCH IN PROGRESS

In the Fall 1991 issue of the Research Review, the FNS Research Corner
reported on seven studies underway that concern the school nutrition pro-
grams. This issue provides a brief status report on those projects and pro-
vides more detailed descriptions of projects underway related to the CACFP.
Readers should refer to the Fall 1991 issue for more complete descriptions
of the school projects.

Commodity Letter of Credit (CLOC)
Modification Demonstration Evaluation.
Currently in Agency clearance. Results of the study will be presented
in the next issue.

Child Nutrition Meal Cost Methodology Study.
Currently in Agency clearance. Results of the study will be presented
in the next issue.

School Food Authority Menu Modification Demonstration Projects.
Data collection is ongoing with a final report expected in Fall 1992.

School Nutrition Dietary Assessment.
Data collection is ongoing with a final report expected in Winter 1992.

Study of Food Service Management Companies.
Data collection is ongoing with a final report expected in Summer 1993.

Data collection is ongoing with an interim report scheduled for Summer, 1993
and a final report anticipated in Summer 1994.

Study of Eligible Nonparticipating Children in the National School Lunch
Program. Data collection to occur in SY 1992-93 with a final report expected in
Fall 1993.

Low-Income Family Day-Care Home Demonstration.
This demonstration project, mandated by P.L. 101-147, is designed to test innovative
approaches to remove barriers to participation in the CACFP faced by family
day-care homes (FDCHs) that operate in low-income areas or that primarily
serve low-income children. Emphasis is placed on identifying strategies to over-
come barriers faced by FDCHs in rural areas.

Three barriers to low-income FDCH participation were identified: the inability
to become licensed or approved; the lack of coordination between CACFP
and other key child care players that serve low-income children; and the lack
of outreach strategies and technical assistance tools that address the educa-
tional deficiencies and cultural needs of low-income providers. Three strategies
were developed and tested in each of two sites:
- Facilitating CACFP eligibility among low-income FDCHs. This strategy
  uses innovative approaches at the sponsor level to help low-income
  FDCHs meet CACFP eligibility require-
  ments. These demonstrations are being
  conducted in Cleveland, Ohio and
  Nashua, New Hampshire.
- Increasing coordination at the state and local level between CACFP and key
  child-care programs. This strategy
  focuses on enhancing coordination
  between CACFP and other child-care
  programs at the state and local level
  (Title XX, licensing/regulatory agencies,
  information and referral groups). These
demonstrations are being conducted in
Washington, D.C., and Virginia.
- Developing targeted outreach
  strategies and technical assistance tools
  that attract and retain low-income
  providers. West Virginia and New
  Mexico are testing this strategy.

An evaluation is currently being con-
ducted to determine the impact of these
demonstrations. Data collection activi-
ties were completed in January 1992.
Data were collected from the demon-
strators, new FDCH providers, and par-
ents of children in the new FDCHs. The
demonstration evaluation is expected to
be completed in the summer of 1992.

For-Profit Center Demonstrations.
Statewide demonstrations are currently
being conducted in Kentucky and Iowa
to modify CACFP eligibility require-
ments for for-profit child-care centers in
efforts to increase program participation
among low-income children. The
demonstration changes for-profit center
eligibility from requiring that at least
25% of the center’s enrollment receive
Title XX benefits to requiring that at least
25% of the children in care be eligible
for free or reduced-price meals. As a
result of participating in the demonstra-
tion, centers must agree to improve
meals, lower fees to low-income chil-
dren, or both.

Data collection activities that occurred in the winter of 1992 included:
mail surveys of State Agencies to collect
data on Title XX and free and reduced-
price center participation rates, budget-
ary impact of the change in eligibili-
ty, and outreach strategies targeted to
for-profit centers; mail surveys of
demonstration centers to collect data on
characteristics of children served, types
of meals served, and child care fees; and
surveys of eligible centers that chose not
to participate in the demonstration to
obtain reasons for nonparticipation. A
final report is expected to be released in
the summer of 1992.
The National Food Service Management Institute (NFSMI) will be conducting research related to school food service to assist practitioners across the country improve the quality and operation of their programs. Beginning with this issue of the School Food Service Research Review, there will be a column to provide readers with updates on research activities of the NFSMI. The purpose of this first column is to provide background information about the NFSMI and the Division of Applied Research and to present a summary of completed research activities and research in progress.

The mission of the Division of Applied Research is to conduct research to enhance training and technical information available to food service personnel to maximize program participation; cost-effectiveness; and quality, nutrition, and acceptability of meals served in child nutrition and related programs. This mission statement clearly conveys the cooperative, synergistic relationship among the three Institute divisions. Applied research activities are planned based on current and anticipated challenges in school food service in anticipation of developing useful information to be disseminated in education and training programs or provided as technical information through the NFSMI’s clearinghouse.

A Research, Education, and Technology Advisory Board (RETAB) has been appointed by the executive director of the NFSMI to assist in developing plans (called Statements of Work) for the three divisions. This Board, which meets twice each year, consists of practitioners and administrators in various types of school food service operations, researchers from colleges and universities, and industry leaders. Research activities, which were initiated in June 1991, reflect ideas and recommendations from the RETAB members.

**COMPLETED RESEARCH ACTIVITIES**

Directory of Researchers in Food Service Management. A short questionnaire was mailed to researchers in food service management, dietetics, and restaurant management at colleges and universities across the nation to determine research interests. A Directory was compiled and includes names, addresses, and areas of research for 81 researchers. This Directory serves as a resource to the research division as they send out requests for proposals and seek individuals to serve on review committees. Practitioners, particularly state directors, can use the Directory as a resource for identifying speakers and consultants, and it will serve as a good networking tool for researchers.

Report of Current Federal Research on Child Nutrition Programs. This report compiles information about past and current research studies sponsored by the U.S. Department of Agriculture’s (USDA) Food and Nutrition Services (FNS) Division. Information from legislation about future research also is included.

**Trends: School Food Service in the Year 2000 and Beyond.** A trends conference was held in October 1991 to identify trends and forces that would affect school food service in the future, how those trends are likely to impact school food service, and directions that the NFSMI should take in its research, education, and training programs based on those trends/forces. Ten experts representing futurology, education, demographics, health, child care, aging, food, technology, food service, and food service equipment addressed the future. Fifteen food service practitioners, along with seven NFSMI staff members and three USDA and FNS staff members participated in the conference. The practitioners, working in two groups, developed reports on trends and forces and their anticipated impact and directions for the NFSMI based on these forces and trends. When the groups convened, a joint vision statement for child nutrition programs was developed along with value statements. A conference proceedings was developed and includes copies of the speeches presented and the consensus report developed based on participants’ discussions.

**Participation in Child Nutrition Programs.** A two-part report on participation in child nutrition programs was developed. Part I is a review of literature, focusing on literature published in the past 25 years since passage of the Child Nutrition Act in 1966. Part II is an annotated bibliography containing both research and anecdotal articles in three major categories: general, factors affecting participation, and program outcomes.

**RESEARCH IN PROGRESS**

Competencies and Training Needs of School Food Service Managers. A research plan and questionnaire was developed to determine competency statements and training needs for managers at the school level. The materials have been submitted for review by the Office of Management and Budget (OMB), and data collection will begin when the plan it approved by OMB. Anticipated completion of this study is June 1992.

Energy Consumption and Conservation in School Food Service Operations. A request for proposals was extended by the Division of Applied Research to conduct a study on energy consumption and conservation in school food service, and a contractor has been selected. As part of the deliverables for the project, the contractor will develop a manual suitable for use by school food service managers on how to reduce energy consumption by implementing energy conservation practices in school food service operations. This manual will serve as a basis for education and training programs and will be made available to food service managers through the NFSMI.

Standards for Quality Assurance and Improvement in School Food Service Operations. A request for proposals has been extended for a project on developing standards for quality assurance and improvement in school food service.

Factors Impacting Productivity and Resource Utilization. The research staff members are currently examining the research literature and past studies of FNS to determine what has been done in relation to productivity and resource...
utilization in school food service. Annotated bibliographies are being prepared on productivity and resource utilization. This background research will serve as the basis for 10 in-depth case studies that are being planned for the next year.

SUMMARY

The Division of Applied Research has made good progress in establishing research activities during the past eight months and has ambitious plans for the next year. In addition to the activities described, a lot of time has been spent in organizing the new division and developing policies and procedures. One important policy and procedure implemented is a research review process to ensure the quality and application to school food service of all research conducted or sponsored by the Division. You are invited to provide feedback on your ideas and needs for research and how you use the products developed by the NFSMI. For more information about research activities and/or publications, contact the Division of Applied Research at (601) 266-5773. For more information about the NFSMI, contact Dr. Josephine Martin, executive director, at (601) 232-7658.
Include name, address and job title. 
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American School Food Service Association, 1600 Duke St., 7th Floor, Alexandria, VA 22314-3436; (800) 877-8822
Guide to Authors

The School Food Service Research Review contains Current Issue, Research and Research in Action articles focusing on food service facilities, food quality and production, management, program evaluation, nutrition standards and nutrition education with implications for school food service. Manuscripts must be original, unpublished, and not submitted for publication elsewhere. Membership in the American School Food Service Association is not a prerequisite for submitting manuscripts. No payment is made to authors, nor is there a fee required for submitting manuscripts. Letters to the editor of the School Food Service Research Review expressing responsible criticism and reaction to material published are encouraged.

Types of Articles
Current Issues: A Current Issue article may be a review of the literature or discussion of a subject of current interest or controversy. The article may evaluate methodology, suggest theory or delineate areas requiring research.

Research: Papers should report original research within the scope of the School Food Service Research Review and include sections titled "Introduction," "Methodology," "Results and Discussion" and "Applications." The introduction should state the purpose of the study and provide a brief discussion of relevant literature. The Methodology should describe the research sample, the research instruments used and how data were collected and analyzed. Research methods used should be described concisely, yet provide sufficient detail to allow the work to be repeated. Any questionnaires or other test instruments used in the research should be submitted for review with the manuscript. Findings should be presented concisely in the Results and Discussion section in the form of tables and figures and should give enough data to justify conclusions. The discussion should point out the significance of the findings and, if possible, relate the new information to previous knowledge. The Application section should suggest how research results can be applied to school food service practice.

Research in Action: Research in Action papers contain reports of ongoing projects and brief descriptions of original research. Preliminary findings or studies that failed to obtain significant results may be reported. Project reports should include discussion of effectiveness or possible shortcomings.

Topics in Brief: Topics in Brief papers are designed to be a brief presentation of an idea. Their purpose is to provide updates on research projects or stimulate thought.

Manuscript Preparation
Length of Articles: Current Issue and Research articles may be up to 12 pages (typed double-spaced), excluding tables, figures, and references. Research in Action articles may be up to 10 pages (typed double-spaced), excluding tables, figures, and references. Topics in Brief articles may be up to four pages (typed double-spaced), excluding tables, figures, and references and should not include more than one table or figure.

Manuscript, Biographical Information, and Abstract: Authors should submit five copies of the manuscript. The title should appear on the first page of the manuscript. The manuscript should be typed double-spaced on 8 1/2-by-11 paper with margins of one inch on all edges. Each page should be clearly numbered. As an aid to reviewers, authors are encouraged to number each line of manuscript copy down the left-hand margin, beginning each page with line one. The title page should include title of article; name; present address and telephone number of authors; name, address, and telephone number of person to whom galleys should be sent; and acknowledgments, if appropriate. Identification of the author should be made only on the title page so the manuscript may be reviewed confidentially. The following information should be included for each author: name, professional suffixes, job title, and place of employment.

An abstract of 250 words or less must be submitted with Current Issue, Research, and Research in Action articles. No abstracts are required for Topics in Brief articles. The abstract should summarize the objectives and key points of the article and be self-explanatory. The title of the article should be included on the abstract page.

Upon notification that their manuscript has been accepted for publication, authors are requested to submit their manuscript on diskette and to include two printed copies.

References: References should be typed double-spaced on a separate sheet and in alphabetical order. Referencing in the text should follow the American Psychological Association (APA) style.

Style: Spell out numbers under 10; however, only use numerals in reporting statistical data (1 percent, 2 inches, $5). Spell out acronyms the first time used with acronym following in parentheses—for example, American School Food Service Association (ASFSA). For other questions of style—for example, title, spelling, abbreviating, punctuation—refer to the APA Style Manual.

Tables: Each table should be typed double-spaced on a separate sheet, numbered, titled and cited in the text. Limit tables to those essential for clarification of the text.

Illustrations: Illustrations should be done in black India ink on white paper and should not be larger than 8 1/2 by 11 inches. Larger illustrations should be reduced photographically and submitted as 8-by-10-inch black-and-white glossy prints. Include author's name, address, illustration number, as well as any other identifying information, in pencil on the back of the illustration. Limit illustrations to those essential for clarification of the text.