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The school lunch program as a vehicle for nutrition education in Iowa public schools

Chi-Ting Chen  
Iowa State University

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The school lunch program as a vehicle for nutrition education in Iowa public schools

by

Chi-Ting Chen

A dissertation submitted to the graduate faculty in partial fulfillment of the requirement for the degree of

DOCTOR OF PHILOSOPHY

Co-majors: Hotel, Restaurant, and Institution Management
Family and Consumer Sciences Education

Major Professors: Shirley A. Gilmore and Rosalie J. Amos

Iowa State University
Ames, Iowa
1999
Graduate College
Iowa State University

This is to certify that the Doctoral dissertation of

Chi-Ting Chen

has met the dissertation requirements of Iowa State University

Signature was redacted for privacy.

Co-major Professor

Signature was redacted for privacy.

Co-major Professor

Signature was redacted for privacy.

For the Co-major Program

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For the Co-major Program

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For the Graduate College
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ABSTRACT

The purpose of this study was to determine the extent to which the Iowa public school food service (SFS) district directors incorporated nutrition education into SFS programs. A preliminary qualitative study was conducted to obtain in-depth information about nutrition education in SFS programs. The resulting information from interviews with 12 private SFS directors was used to develop a self-administered questionnaire for this study.

The questionnaire consisted of three parts: demographic information, nutrition education activities, and attitudes toward nutrition education. The questionnaire was pilot tested, revised, and mailed to 377 Iowa public SFS district directors. The return rate was 74% (n=280).

The majority of respondents were female, between the ages of 40 and 59, had the job title of SFS director, and possessed the minimum of a high school diploma. Findings indicate that three major sources of nutrition education materials were commodity groups, state government, and the United States Department of Agriculture. Nutrition education materials were received on a monthly basis. Posters, newsletters, brochures, and flyers were the most frequently used nutrition education materials.
Respondents performed most nutrition education activities with SFS personnel and students but seldom with nurses, principals, school boards, superintendents, other school administrators, teachers, and/or parents. Nearly half of the respondents used marketing activities to promote healthy eating habits and involved students in the preparation of nutritious meals in the school cafeteria. In general, respondents had positive attitudes toward nutrition education and recognized the importance of incorporating nutrition education into SFS programs.

Results of the study indicate that Iowa public SFS district directors significantly differed in backgrounds, nutrition education activities, and attitudes toward nutrition education among small, medium, and large school districts. Positive differences in backgrounds, nutrition education activities, and attitudes toward nutrition education were associated with the size of the school district. The results of this study can be used to enhance nutrition education in Iowa SFS programs.
CHAPTER 1. INTRODUCTION

The National School Lunch Program (NSLP) was authorized by the National School Lunch Act of 1946. The statute reads: 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 food, by assisting the States, through grants-in-aid and other means, in providing an adequate supply of foods and other facilities for the establishment, maintenance, operation, and expansion of nonprofit school-lunch programs. (National School Lunch Act of 1946, p. 230)

Since then, providing school-age children with nutritious meals and promoting healthy food choices are two important responsibilities assigned to all local school food service (SFS) professionals participating in the NSLP (National School Lunch Act of 1946; NSLP, 1998a). SFS professionals should use the school lunch program to deliver and reinforce nutrition messages in the school environment.

It is recognized that healthy diets and food choices are two critical components of promoting health and reducing the risk of chronic disease (McConnell & Shaw, 1996). Studies
have shown that the meal patterns of the NSLP strongly influence children's food habits. Students who participate in the school lunch program have better food consumption patterns than nonparticipants (Burghardt & Devaney, 1993; Centers for Disease Control and Prevention [CDC], 1996; Gordon & McKinney, 1995; Melnik, Rhoades, Wales, Cowell, & Wolfe, 1998). Both Dwyer (1995) and Fitzgerald (1996) identified that children obtain a significant portion of their daily nutrition from school. Crockett and Sims (1995) stated that meals and foods available to children at school are important for them to meet their nutritional needs and develop healthy eating habits. These authors indicated that the NSLP has an important role in children's daily food intakes and school personnel have a responsibility to help children develop healthy eating habits.

Today, children are facing immediate and serious health problems such as iron deficiency anemia, obesity, and eating disorders, many of which are caused by poor dietary habits (CDC, 1996; McConnell & Shaw, 1996). At least one in five children is overweight, a 50% increase in the last two decades (McMabon & Cameron, 1998). School personnel need to help children develop lifelong eating habits consistent with the Dietary Guidelines for Americans (DGA) and the Food Guide Pyramid (FGP) as well as provide them with nutritious meals.
Comprehensive school nutrition education programs that include opportunities for and reinforcement of healthy eating should be available to all students in the school environment (Olson, 1995). Teachers, administrators, and SFS personnel are recognized as key components in providing nutrition education in the school environment (Norton, Falciglia, & Wagner, 1997). Involving teachers, administrators, school board members, SFS personnel, communities, students, and family members in supporting and reinforcing nutrition education is critical to the effective implementation of school-based nutrition education programs (CDC, 1996).

SFS personnel are recognized as primary links to increasing acceptance of school nutrition education programs by students. SFS personnel have a positive influence on students' knowledge about foods and encourage good food habits by providing them with nutritious meals and participating in nutrition education programs (Neill, 1979). White (1994) encouraged all SFS personnel to take a leadership role in the integration of SFS programs and nutrition education.

At the school district level, SFS programs and Child Nutrition Programs (CNP) are administered and managed by SFS district directors. They are encouraged to involve school faculty and the community in the delivery of nutrition education to help students develop good food choices (NSLP,
evaluation of their job functions indicated that the majority of SFS district directors rated nutrition education as the least important function of their jobs, and they seldom participated in nutrition education (Conklin, 1995; Gregoire & Sneed, 1994). Thus, based on conclusions from these national data, it is important to examine the extent to which Iowa SFS district directors use nutrition education activities and to determine their attitudes toward nutrition education.

Statement of Problem

The role of the SFS director is not only to provide adequate nutrition for students, but also to educate students in developing healthy food choices. Using the cafeteria as a learning laboratory for nutrition education is one of the primary goals for SFS programs (The White House Conference on Food, Nutrition, and Health, 1970). Implementing nutrition guidelines and providing nutrition education resources also are regarded as critical duties of Iowa SFS district directors. Therefore, it is important to understand the role of Iowa public SFS district directors in nutrition education.
Purpose and Objectives

The purpose of this study was to determine the extent to which the Iowa public SFS district directors incorporated nutrition education into SFS programs. Specifically, the study was designed to attain the following objectives:

1. Observe the extent to which Iowa private SFS directors incorporate nutrition education into SFS programs and obtain in-depth information to develop a self-administered instrument for use with district directors in Iowa public SFS programs.

2. Examine the extent to which Iowa public SFS district directors use nutrition education activities.

3. Determine attitudes of Iowa public SFS district directors toward nutrition education.

4. Determine whether Iowa public SFS district directors differ on background and district variables including attitudes toward nutrition education and incorporation of nutrition education activities.

Assumptions of the Study

1. The respondents will be honest in their responses.

2. The respondents will interpret the questionnaire correctly.
3. The questionnaire, in terms of construction and administration, will be a reliable and valid instrument to provide meaningful information about Iowa public SFS district directors' nutrition education activities and their attitudes toward nutrition education.

Definitions

SFS district director: One who is responsible for the management and administration of SFS programs at the district level.

The size of public school districts: District size is determined by the enrollment in each Iowa public school district. In this study, Iowa public school districts have been divided into three groups: small school districts < 450, medium school districts ≥ 450 and < 1500, and large school districts ≥ 1500.

Nutrition education: "Any set of learning experiences designed to facilitate the voluntary adoption of eating and other nutrition-related behaviors conducive to health and well-being" (Olson, 1995, p. 2).
CHAPTER 2. REVIEW OF LITERATURE

The review of literature includes four major sections: the National School Lunch Program (NSLP), Iowa school lunch programs, job functions of school food service (SFS) district directors, and nutrition education in SFS programs.

The National School Lunch Program

In 1946, the NSLP was authorized to safeguard the health and well-being of children in the United States (U.S.) by providing healthful meals, and to encourage the domestic consumption of nutritious agricultural commodities and other foods (National School Lunch Act of 1946). The U.S. Department of Agriculture (USDA) provides:

States with general and special cash assistance and donations of foods acquired by the Department to be used to assist schools in serving nutritious lunches to children each school day. In furtherance of Program objectives, participating schools shall serve lunches that are nutritionally adequate, as set forth in these regulations, and shall to the extent practicable, ensure that participating children gain full understanding of the relationship between proper eating and good health. (NSLP, 1998a, p. 7)
According to the American School Food Service Association (ASFSA) (1989), the NSLP is the oldest and the largest school feeding program in the world. In 1990, more than 7.4 billion school lunches were served (Fogleman, Dutcher, McProud, Nelken, & Lins, 1992). In 1993, Burghardt and Devaney reported that the NSLP was available to 92% of all students in the country and on a typical school day, 56% of them participated. The NSLP is the largest federal child nutrition program and the second largest single source of federal funding for elementary and secondary schools, with nine child nutrition programs that receive federal cash and commodity support.

Administration and meal pattern requirements

The NSLP is administered at the federal level by the USDA and Food and Nutrition Service (FNS), and at the state level by the department of education. In order to qualify for cash reimbursement and commodity assistance, a school district or a single school must implement federal regulations. The main regulations include meal requirements, free and reduced-price meal eligibility, and meal accountability. Schools participating in the NSLP are required to meet nutritional requirements and provide reimbursable school lunches to students (VanEgmon-Pannell, 1990). Reimbursable meals are
designed to provide students with one-third of the Recommended Dietary Allowances (RDA) using a serving of meat or meat alternative, two or more servings of fruits and/or vegetables, enriched or whole-grain bread or bread alternate, and milk. The serving quantity depends on the ages and grade levels of students (Burghardt & Devaney, 1993). All age groups must be offered the five food components at the minimum quantity specified to meet the meal requirements. Students must select at least three food components to meet reimbursable lunch requirements (VanEgmond-Pannell, 1990).

Implementation of nutrition guidelines and regulations

It is important to ensure the quality of the NSLP and to provide healthy food choices to all children. In 1980, the first edition of Dietary Guidelines for Americans (DGA) was issued by the USDA as a guide for states and local school districts to meet nutritional requirements for SFS programs. In 1992, the Food Guide Pyramid (FGP) was developed by the USDA as a system to guide specifically the selection and consumption of foods for children and adults to meet the DGA (Caldwell, 1995). In the Healthy Meals for Healthy Americans Act of 1994, school food authorities in the NSLP were required to comply with the DGA. The School Meals Initiative for Healthy Children Rule (1995) amended the nutrition standards
for the NSLP to ensure that school food authorities adapt a variety of menu planning alternatives and update nutrition standards for school meals to meet the DGA. In the Healthy Meals for Children Act (1996), school food authorities were allowed to plan menus by using the traditional meal pattern or any reasonable approach to meet the nutrition standards established in the DGA.

Obstacles that impeded SFS directors from implementing the DGA were identified by DeMicco (1990). They were lack of classroom education and parental support for reinforcing practices of SFS programs, lack of students' interest in nutrition, financial constraints of changing menus, and available government commodities and vendor food products inconsistent with the DGA. SFS directors suggested that being linked with nutrition education programs may enhance integration of the DGA into the school lunch program.

Hahn (1996) surveyed 900 SFS directors' concerns about meeting nutrition standards in SFS programs. More than half of SFS directors stated that their top concern was the acceptance of lower fat meals by students. Barriers to compliance with nutrition standards included lack of time, lack of computer software capabilities, and lack of training. To enhance the implementation of nutrition standards in SFS programs, SFS directors expressed a need for computer
training, computer equipment and software, and nutrition education.

To evaluate the implementation of the DGA into the Child Nutrition Programs (CNP), Hurd, Friedman, and Cise (1996) surveyed 1063 SFS district directors in Texas. The researchers indicated that the directors in large school districts followed the DGA more than those in smaller school districts. Large school district food service directors were assumed to have better access to food products and greater economic and educational resources. They encouraged all SFS directors to work to overcome these challenges.

Children’s food choices

Increasingly, awareness of the importance of diet for health promotion and disease prevention has led to a great concern about the diet and food consumption patterns of children. In 1992, the School Nutrition Dietary Assessment study was conducted to examine school meals and students’ 24-hour food and beverage consumption over a five-month period and to determine whether students’ diets and school meals met the RDA for nutrients. From the study, it was found that the sources of students’ lunches influenced their dietary intakes. Students who did not participate in school meals consumed less than 20% of the RDA for several key nutrients. School lunch
participants consumed more fruits, vegetables, and grains than nonparticipants, and they consumed almost twice the amount of milk and milk products as nonparticipants. School lunch participants had better food consumption practices than nonparticipants (Burghardt & Devaney, 1993).

Burghardt and Devaney (1993) reported that NSLP participants consumed about one-third or more of the daily RDA for food energy and most vitamins and minerals at school lunch. Except for adolescent female NSLP participants, vitamin and mineral intakes for all age and gender subgroups exceeded the RDA. In general, NSLP participants consumed more than the recommended amount of fat, saturated fat, and sodium at school lunch. To reduce the amount of fat in NSLP lunches, the authors suggested SFS professionals choose low-fat foods in menu planning and limit added fats in food preparation. SFS professionals need guidance in keeping fat at an appropriate level while planning and preparing meals that appeal to students. Additionally, students must be educated about the importance of selecting a variety of healthy foods.

In the study of teenage noontime meal consumption, Johnson, Johnson, and Schulz (1994) surveyed 933 teenagers who consumed a total of 2,223 noontime meals over a three-day period. Sources of noontime meals were divided into five categories: school lunch meals (40%), meals eaten at home
(38%), bag lunches from home (7%), restaurant meals (10%), and other meals sources from stores, vending machines, and friends' homes (5%). The researchers reported that school lunch meals contained the highest levels of several key vitamins and minerals but also the highest amount of total and saturated fat among the five categories. The noontime selections teenagers made from restaurants and other meal sources were of poor quality. These meals contained high amounts of total and saturated fat, contained some of the highest levels of cholesterol, and lacked the amount of essential vitamins and minerals contained in the school lunch meals. The researchers determined that school lunch was still one of the best sources of critical vitamins and minerals among school children of all ages. They encouraged SFS professionals to meet the DGA for reducing total and saturated fat intake in the school lunch program.

In the School Nutrition Dietary Assessment Study, Gordon and McKinney (1995) analyzed the dietary intakes of 3350 students in grades 1 through 12. The researchers compared the dietary intakes of students who participated in the NSLP with intakes of nonparticipants. NSLP participants were more likely than nonparticipants to consume milk, meats, grain mixtures, fruits, and vegetables, leading to higher intakes of protein, fat, sodium, calcium, and vitamin A. Also, NSLP
participants were less likely than nonparticipants to consume cakes and cookies, soft drinks, and fruitades, which do not count toward the program requirements. Nonparticipants in the NSLP were three times as likely as NSLP participants to eat sugar, sweets, and sweetened beverages. The researchers concluded that the meal-pattern requirements of the NSLP strongly influenced what participants consumed and had a positive impact on students' food choices.

A report from the Centers for Disease Control and Prevention (CDC) (1996) indicated that only 20% of youth ages 12-18 consumed the recommended five or more servings of fruit and vegetables daily, and nearly 50% of youth ate fewer than one serving of fruit per day. The average calcium intake of the female youth was 30% less than the RDA. Only 15% of youth met the RDA for total fat intake. To improve the youth's diets, SFS programs are identified as one of the most important sources for promoting healthy eating in the school environment. Students can have a positive improvement in their daily food intakes by participating in the SFS programs and practicing healthy food choices.

Food consumption patterns of 693 2nd-grade students and 704 5th-grade students from public and private schools in New York City school children were examined (Melnik, Rhoades, Wales, Cowell, & Wolfe, 1998). Participants in the school
lunch program were compared with nonparticipants. The researchers developed diet indexes based on the FGP and 5-A-Day for Better Health recommendations (5-A-Day) to record data. The researchers reported that children consumed less than the recommended number of daily FGP servings for bread, vegetables, and fruits, but met the recommendations for milk and meat regardless of grade. About 75% of 2nd-grade students and 72% of 5th-grade students did not meet the 5-A-Day recommendation. School lunch participants consumed more fruits and vegetables and less fats, oils, and sweets than nonparticipants in both grades. The researchers indicated that participating in the school lunch program caused positive improvements in food consumption patterns of children.

These studies have shown that children and youth who participated in the NSLP positively improved their daily food intakes. Through promoting the NSLP, SFS professionals can reinforce messages about nutrition and help students at all grade levels develop healthy food choices. It is important to promote the integration of SFS programs and nutrition education. Caldwell (1995) urged that whatever happens to federal funding and to nutrition guidelines for the NSLP, those who are committed to good nutrition for all students to continue to encourage students' participation in the school
lunch program, provide them with nutritious meals, and incorporate nutrition education into SFS programs.

**Iowa School Lunch Programs**

At the state level, the Iowa Department of Education, Department of Food and Nutrition Bureau, is authorized to administer school lunch programs in public and nonpublic schools (School Meal Programs, 1995a). School lunch program was defined as a program serving public school children in the state of Iowa on a nonprofit basis, incorporating any school assistance from funds appropriated by the Congress of the United States (School Meal Programs, 1995b).

Through school lunch programs, it was authorized that:

All school districts shall operate or provide for the operation of school lunch programs at all public schools in each district. The programs shall provide students with nutritionally adequate meals and shall be operated in compliance with the rules of the state board of education and pertinent federal rules, for all students in each district who attend public school four or more hours each school day and wish to participate in school lunch program. School districts may provide school lunch programs to other students. (School Meal Programs, 1995c, p. 2237)
Iowa school lunch programs are administered by the director of the Iowa Department of Education and Iowa school food authorities who are defined as "the governing body which is responsible for the administration of one or more schools, and has the legal authority to operate the Program" (NSLP, 1998b, p. 10). The director of the Department of Education gives technical advice and assistance to school boards in connection with the establishment and operation of school lunch programs and assistance in training personnel engaged in the operation of the program (School Meal Programs, 1995a). Also, the director provides "educational resources and technical assistance to schools relating to the implementation of the nutrition guidelines for food and beverages sold on public school grounds or non-public schools receiving funds under section 283A.10" (Department of Education, 1995, p. 1968).

School food authorities are empowered to promote activities such as menu planning, enhancement of the eating environment, and related student-community support activities to involve students and parents in school lunch programs. School food authorities are given the mission to teach students about good nutrition practices as well as involve school faculty and the general community in activities which would enhance school lunch programs (NSLP, 1998c).
Job Functions of School Food Service District Directors

The responsibilities of SFS district directors involved planning, coordination, and administration of the district CNP (Conklin, 1995). SFS district directors oversee the preparation and serving of nutritious meals and incorporate nutrition education to assist students in developing healthy food attitudes and making wise food choices, not only for the present, but also for a lifetime (Neill, 1981).

Job functions and training needs of 342 SFS district directors in Pennsylvania were studied by DeMicco, Palakurthi, Sammons, and Williams (1994). Job functions were categorized into 11 areas: life skills, nutrition education, financial management, food production, personnel functions, community relations, property management, legal aspects, customer service, products, and management skills. SFS district directors reported that the five most important tasks of their jobs included knowledge of USDA and Pennsylvania Department of Education regulations, establishment and evaluation of quality programs, integration of the DGA into menu planning and nutrition education, budgeting, and time management. The management skills area was rated highest in training needs, followed by financial management, legal aspects, and nutrition education. The researchers indicated that the foundation for
a successful SFS program was based on the knowledge, skills, and abilities of SFS directors.

The importance and frequency of performance that included 192 competency statements in 16 functional areas were rated by 600 SFS district directors (Gregoire & Sneed, 1994). Functional areas included service, sanitation and safety, financial management and recordkeeping, food production, procurement, program accountability, nutrition and menu planning, general management, personnel management, facility layout and design and equipment selection, research and development, environmental management, marketing, computer applications, professional development, and nutrition education in descending order of importance. The first three functional areas were rated as the most important. Service and food production areas were performed most frequently. Nutrition education was seldom performed and rated as the least important of the competencies. The researchers determined that importance and frequency of job functions differed based on the size of the district (district enrollment) and SFS district directors’ personal variables (education and certification status). SFS directors in small school districts perceived many aspects of their jobs as less important than directors in large school districts.
Job functions of 616 SFS district directors were examined by Conklin (1995). The perceived importance of their job functions and tasks were determined. The required 16 job function areas of a SFS district director were customer service, sanitation and safety, financial management and record keeping, food production, procurement, program accountability, nutrition and meal planning, general management, personnel management, equipment, research, environmental management, marketing, computers, professional development, and nutrition education. Job functions rated highest by SFS district directors were customer service, sanitation and safety, financial management and record keeping, food production, procurement, and program accountability in descending order. Nutrition education was rated as the least important function of their job.

Conklin (1995) stated that the emphasis on nutrition education, nutrition integrity, and the implementation of the DGA has become increasingly important. Customer service is perceived by the SFS district directors as a major job function. SFS district directors should focus more attention on strategies to provide quality services and meet students' expectations and needs. Brown, Gilmore, and Dana (1997) stated that students' perceptions and expectations about food quality were different from those of SFS personnel and
faculty. The importance of listening and communicating with student customers should be emphasized. Fogleman et al. (1992) also stated that SFS professionals need to meet students’ increasingly sophisticated expectations in order to maximize the potential of SFS programs. Therefore, continuous professional development and training programs associated with job functions should be provided to all SFS district directors.

Robinson and Hamilton (1995) conducted a needs assessment for the Iowa NET Program to identify the nutrition education and training needs of SFS district directors, SFS managers, and health educators, and to determine problems encountered in coordinating nutrition education with the CNP. A total of 102 (77%) SFS district directors, 217 (48%) SFS managers, and 177 (33%) health educators completed their questionnaires.

More than half of the SFS district directors reported that they completed training programs about using the DGA and job-related areas during the 1994 school year. However, only 17.6% of SFS district directors met with the curriculum director to discuss ways that SFS programs can support classroom nutrition education activities. Over 50% of SFS district directors lacked time to work with teachers on classroom nutrition education activities. Approximately 84% of SFS district directors indicated that the job description
for their district-level SFS management staff did not include classroom nutrition education for students.

Responses of SFS managers indicated that half did not perceive their role as the primary resource person in nutrition education for their school. Approximately 37% of SFS managers provided information on the DGA and/or the FGP to classroom teachers. The majority of SFS managers (70%) recognized the importance of discussing current nutrition issues with teachers, school administrators, parents, and students. The researchers reported that over 85% of Iowa health educators did not respond positively about working with SFS managers to use the cafeteria as a laboratory for students to practice making healthy food choices, and did not agree with school principals encouraging teachers to use the cafeteria as a learning laboratory for classes on food and nutrition.

**Nutrition Education in School Food Service Programs**

SFS "can function as laboratories for applying nutrition principles taught in classrooms" (The White House Conference on Food, Nutrition, and Health, 1970, p. 25). Lytle, Kelder, and Snyder (1992) indicated that "SFS programs have been long recognized as an important component of a comprehensive school health program, directly affecting the nutrition of children"
SFS programs and nutrition education are an integral part of the total education process in the school environment. SFS programs can be used as a resource for nutrition information and guidance, a source of nutritious meals, a laboratory for learning experiences, and a catalyst for an integrated approach to nutrition and nutrition education (White, 1994).

Schools are a critical part of the social environment that shape children's eating behaviors. Fitzgerald (1997) stated that SFS programs and nutrition education can be integrated to provide students with healthy food choices. Over the years, studies have shown that effective nutrition education can result in increased knowledge about nutrition, positive attitudes toward healthy eating, and changes in patterns of food consumption at all school levels (CDC, 1996; Crockett & Sims, 1995; Fitzgerald, 1997; Johnson, D. W. & Johnson, R. T., 1985; Olson, 1995; Penner & Kolasa, 1983; Skinner & Woodburn, 1983; Skoog, 1995). In the Nutrition Education Training (NET) Program of the USDA, nutrition education is advocated as a major educational component of all child nutrition programs. Nutrition education should be offered in all schools, child care facilities, and summer sites by the year 2000 (Mandell, 1993).
Purposes and goals of nutrition education

The process of nutrition education has been defined as: The teaching of validated, correct nutrition knowledge in ways that promote the development and maintenance of positive attitudes toward, and actual behavioral habits of eating nutritious foods (within budgetary and cultural constraints) that contribute to the maintenance of personal health, well-being, and productivity (Johnson, D. W. & Johnson, R. T., 1985, p. S2).

They stated that the purpose of nutrition education is to create informed customers who value good nutrition, make healthy food choices, and consume nutritious foods throughout their life. For students, the goals of nutrition education include:

1. Mastering knowledge taught in nutrition units.
2. Building conceptual and behavioral frameworks for nutrition principles and applications.
3. Developing positive attitudes toward good nutrition habits.
4. Consuming nutritious foods.

Lytle and Achterberg (1995) identified five elements of successful nutrition education programming:

1. Programs are behaviorally based and theory driven.
2. Programs for elementary-aged children include family involvement.

3. Programs for middle to senior high school students include self-assessment of eating patterns.

4. Behavior change programs include intervening in the school environment and communities.

5. Programs include intensive instruction time.

**Nutrition problems of school-age children**

Problems and issues involving food and nutrition have been a major national and international concern over the years. Undernourished children are more likely than other children to become sick, miss school, and score lower on tests. Poor eating habits cause overweight and obesity. Eating disorders such as anorexia nervosa and bulimia nervosa are increasing among young people (CDC, 1996). Excess fat and sodium intakes are found in children’s diets that may cause heart disease and certain cancers. The focus of nutrition education should be on preventing children from developing these chronic diseases (McConnell & Shaw, 1996). McMabon and Cameron (1998) reported that at least 20% of children were overweight, a 50% increase in the past 20 years. The authors indicated that children’s low energy expenditure and increased
fat intakes were the major reasons for the increase in obesity.

The food offered in SFS programs has an important impact on children's diets. Dwyer (1995) reported that more than one-half of children eat one of their three main meals in school and one in ten children and adolescents have two of their three main meals in school. Fitzgerald (1996) stated that school-age children most often eat at the school cafeteria, followed by someone else's house, then quick-service restaurants. One in three school-aged youth obtain more than 40% of their total calories from food served outside the home. The school cafeteria is the most frequent source of daily food intake. Because children and adolescents frequently decide what to eat with little adult supervision, school-based nutrition education becomes very important for them (Crockett & Sims, 1995). CDC (1996) urged that children and adolescents receive nutrition education to help them develop lifelong eating patterns consistent with the DGA and the FGP.

Effective nutrition education materials and activities

Nutrition education materials and activities are utilized to attain and reinforce positive food-related behavior changes (Anderson, 1994). Suppliers of nutrition education materials
may include government agencies, non-profit organizations, commodity groups, commercial sources, educational institutions, and professional associations. The nature of these nutrition education materials is unlimited (Tagtow, 1997). To promote nutrition education, school authorities are encouraged to "develop classes on food, diet, and health; to purchase books, posters, and videocassettes; and to develop education programs using the school kitchen as a nutrition laboratory" (Citizen's Commission on School Nutrition, 1990, p. 2).

Opitz (1993) reviewed nutrition education materials for use in nutrition education programs. The author indicated good nutrition education materials were available that effectively combine fun and learning and recommended ones to use. The Dairy Council and Cooperative Extension were rated as most helpful nutrition education resources by 141 elementary and secondary school teachers in northwestern Nevada (Woodson, Benedict, & Hill, 1995). Approximately 68% of 73 elementary teachers and 38% of 68 secondary teachers stated that nutrition education resources and activities were limited and unavailable to them. In addition, elementary teachers were less likely to seek support from community agencies and other professionals. Secondary teachers had more resources compared to elementary teachers. To enhance the
effectiveness of nutrition education, the researchers suggested that nutrition education sources and training programs must be provided to all teachers.

In the study of nutrition education in Ohio elementary schools, the school-based system, the Dairy and Nutrition Council, and the American Heart Association were identified by 534 teachers as the most available and useful nutrition education materials in descending order (Norton, Falciglia, & Wagner, 1997). Teachers generally were willing to work with their SFS directors and personnel in a variety of nutrition education activities to promote the effective teaching of foods and nutrition. SFS personnel were perceived as resource people in the classroom and the school cafeteria as a learning laboratory. Teachers were more likely to participate in nutrition education if nutrition education materials were available.

To enhance nutrition education and promote nutrition education activities, Hahn (1996) suggested that SFS directors should involve students in planning, preparing, tasting, and promoting foods in SFS programs. CDC (1996) encouraged SFS professionals to help students adopt healthy eating habits by:

1. Providing students with nutritious meals that meet USDA nutrition standards and the DGA.
2. Displaying educational posters about healthy food choices and posting the nutritional content of foods served to reinforce nutrition information taught in the classroom.

3. Involving students and families in planning school menus.

4. Coordinating activities with classroom and physical education teachers and other staff.

School-based nutrition education programs

Comprehensive school-based nutrition education programs and services should be provided to all students. Students should have opportunities to practice and reinforce healthy eating choices in the school environment. The involvement of school administrators, teachers, child nutrition professionals and educators, parents, and the community in school-based nutrition education programs is critical to the success of school health services (Olson, 1995). In addition, federal and state governments must be involved with and encourage the development of partnerships among government, food service industry, schools, families, communities, and the media to improve children’s diets (Crockett & Sims, 1995; Lytle & Achterberg, 1995).

Clawson, Sumner, and McPherson (1984) reported the results of a three-year school-based nutrition education
program for middle school students in North Carolina. The nutrition education program was implemented successfully through the school lunch program by a team approach involving teachers, students, food service personnel, community, and parents. Positive changes were observed in nutrition knowledge, food intake, and physical fitness of 335 students.

Norton et al. (1997) assessed the status of nutrition education in Ohio elementary schools to identify intervention targets and potentially effective strategies for increasing the effectiveness of school-based nutrition education programs. The researchers identified teachers, administrators, and SFS personnel as key components of the school environment in the delivery of nutrition education programs. The researchers recommended that teachers and SFS professionals build strong collaborations as a team to ensure that meals provided in the cafeteria reinforce principles to good nutrition taught in the classroom, and to provide students with learning opportunities and knowledge about nutrition to practice healthy food choices.

To implement the most effective school-based nutrition education programs, guidelines were developed as follows:

1. Help students learn healthy eating skills.

2. Provide students opportunities to practice healthy eating.
3. Make nutrition education activities fun.

4. Involve teachers, administrators, food service personnel, families, communities, and students in delivering strong, consistent messages about healthy eating as part of a coordinated school health program.

It was recommended that SFS personnel coordinate SFS programs with nutrition education and with other components of the school health programs to reinforce messages about healthy food choices (CDC, 1996).
CHAPTER 3. METHODOLOGY

The purpose of this study was to determine the extent to which the Iowa public school food service (SFS) directors were incorporating nutrition education into SFS programs. This chapter describes the research procedures followed in the study. It includes five sections: use of human subjects in research, preliminary qualitative study, study, data collection, and data analysis.

Use of Human Subjects in Research

The Iowa State University Committee on the Use of Human Subjects in Research reviewed and approved the proposal for this study (Appendix A). The Committee ruled that the rights and welfare of the human subjects were adequately protected, no risks or discomforts to the participants were anticipated, the confidentiality of data were assured, and a cover letter to subjects clearly stated the purpose of the research and guaranteed the confidentiality of their responses.

Preliminary Qualitative Study

In order to accomplish the purpose of this study, the first objective was to observe the extent to which Iowa private SFS directors incorporate nutrition education into SFS
programs and obtain in-depth information to develop a self-administered instrument for use with district directors in Iowa public SFS programs. To meet this objective, the researcher developed an interview schedule (Appendix B).

**Interview schedule**

A review of literature was undertaken to choose relevant content to support construct-related evidence of validity for the development of items. Items were written to determine: demographic information, nature and extent of nutrition education activities, and attitudes about the importance of nutrition education. A seven-point scale was used to determine frequency of SFS directors' nutrition education activities (1=daily to 7=never), and a five-point Likert-type scale (1=strongly disagree to 5=strongly agree) was used to determine SFS directors' attitudes toward nutrition education. Content-related evidence of validity for the items was established by a panel of experts in SFS research at Iowa State University and the coordinator of the Nutrition Education and Training Program (NET) in the Iowa Department of Education.

The completed interview schedule included items related to demographic information, nutrition education activities, and nutrition education attitudes. In addition, three
open-ended questions concerned aspects about implementing nutrition education. The schedule then was used as a guide to ensure consistency across the individual interviews.

**Sample selection**

Purposive sampling was used to select 12 private SFS directors to interview in 8 different Iowa counties. The names and addresses of selected private schools were provided by the NET coordinator from the Iowa Department of Education. Interviewees represented private SFS directors in small, medium, and large schools (n=4 for each). The size of schools was determined by the enrollment in each school. Iowa private schools were divided into three groups: small schools < 300, medium schools ≥ 301 and < 500, and large schools ≥ 501.

**Interviews**

The researcher conducted individual interviews, using the interview schedule, in either the interviewee's office, SFS kitchen, or a school cafeteria. After all interviews were completed, data were compiled and analyzed. The results of this preliminary study are in Appendix B.
Study

To address objectives two, three, and four the researcher developed a self-administered questionnaire for surveying Iowa public SFS district directors.

Instrument development and pilot testing

Based on the findings from the interviews in the preliminary study and the experts’ recommendations, items were revised and a self-administered questionnaire was developed. The self-administered questionnaire, a cover letter, and a self-addressed, stamped envelope were sent to another 12 Iowa private SFS directors for pilot testing. Completed questionnaires were returned by eight of the Iowa private SFS directors (67%). Following the review of the pilot test results, the questionnaire was finalized and printed for mailing to the research sample.

Data Collection

The names and addresses of Iowa public school districts were provided by the Iowa Department of Education. Enrollments in Iowa public school districts were used to determine the relative size of each school district (Market Data Retrieval, 1998). Enrollments ranged from 38 to 31,878. School districts were divided into three groups: small
districts < 450, medium districts > 450 and < 1500, and large
districts > 1500. The sample included 88 small districts
(23%), 211 medium districts (56%), and 78 large districts
(21%). District enrollment was categorized into groups 1, 2,
and 3: group 1=small school districts, group 2=medium school
districts, and group 3=large school districts. The
questionnaire with a cover letter and procedural instructions
(Appendix C) was mailed to all Iowa public SFS district
directors (n=377). These SFS district directors are
responsible for the management and administration of food
service programs in Iowa public schools at the school district
level.

A record (Appendix D) was kept of school districts,
addresses, and responses of SFS district directors. About two
weeks after the initial mailing, follow-up postcards
(Appendix E) were sent to encourage the participation of
non-respondents.

Data Analysis

Data were analyzed using Release 6.0 of the Statistical
Package for the Social Sciences (SPSS). Raw data for
nutrition education attitude items 1, 2, 9, 10, 11, 12, 13,
15, 16, 18, 20, and 24 were reversed prior to computing
descriptive statistics and Cronbach’s coefficient alpha
because they were stated with a negative valence. Descriptive statistics including frequencies, percentages, means, and standard deviations were computed for each variable in the study. A reliability test was performed on each factor with resulting Cronbach's alpha.

To examine and determine if Iowa public SFS district directors significantly differed in district and background variables, frequencies of nutrition education activities, and responses to the nutrition education attitudes, nonparametric tests were used. Frequency distributions of variables were used to identify the level of normalcy of the distributions prior to conducting nonparametric tests. The Kruskal-Wallis test (Gibbons, 1976; Hinkle, Wiersma, & Jurs, 1994) was applied to determine if there were significant differences in SFS district directors' backgrounds, nutrition education activities, and nutrition education attitudes among the three groups: small (group 1), medium (group 2), and large (group 3) school districts. A statistical significance of $p<0.05$ was used to determine the significance of the tested relationships. The Mann-Whitney test and the Bonferroni method were performed to identify if there were significant differences between any of two groups.
t-test with alpha=0.05 would have a significance level of $p<0.017 \ (0.05/3)$ if three different t-tests were calculated. The effect of using Bonferroni method is to control for the Type I error rate. In this study, use of the Bonferroni method would lower the number of significant differences found in background variables, nutrition education activities frequencies, and nutrition education attitude responses of SFS district directors between two groups when compared to the results using the traditional t-test with $p<0.05$. However, the need to control for the Type I error rate to increase the accuracy of findings was important for this study. The results of this study and the implications of data analyses were presented and discussed in the next chapter.
CHAPTER 4. RESULTS AND DISCUSSION

Results

In this quantitative part of the study, the specific objectives were to examine the extent to which Iowa public school food service (SFS) district directors use nutrition education activities, to determine attitudes of Iowa public SFS district directors toward nutrition education, and to determine whether Iowa public SFS district directors differ on background and district variables including attitudes toward nutrition education and incorporation of nutrition education activities. A self-administered questionnaire was used to collect data about Iowa public SFS district directors' demographic information, nutrition education activities, and nutrition education attitudes. Results of the study are presented in three parts: description of the sample, analysis of nutrition education activities, and analysis of attitudes toward nutrition education.

Description of the Sample

The demographic data for the Iowa public SFS district directors are described in this section. Descriptive statistical procedures were used to determine frequencies and percentages. Responses of 280 (74.3%) Iowa public SFS
district directors from 68 small school districts, 159 medium school districts, and 53 large school districts were used for data analysis. In the first part of the questionnaire, respondents were asked to provide district and demographic information. Information was collected on district enrollment and mission statement for SFS programs, demographic information on SFS district directors, and sources of and frequency of receiving nutrition education materials. Demographic information included job title, gender, age, education level, academic major, certification status, years in SFS, and years in the present position.

**Characteristics of the school districts and sample**

The data indicate that 56.8% of respondents were in programs with a district enrollment 450 to 1500 (medium school districts), 24.3% under 450 (small school districts), and 18.9% over 1500 (large school districts). These percentages closely reflect the original distribution. The majority of respondents (70.7%) reported that there was no mission statement in their district SFS programs.

Approximately 77% of respondents in the large school districts reported their job title as food service director (Table 1). In the medium school districts, job titles used most often were food service director (46.5%) and head cook
Table 1. Demographic characteristics of the sample (N=280)

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*Group 1=small school districts (n=68), group 2=medium school districts (n=159), and group 3=large school districts (n=53).

*More than one response possible.
Table 1. (continued)

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(27.0%). Over 50% of respondents in the small school districts had the job title of head cook.

The majority of respondents were female (94.3%) between the ages of 40 and 59 (70.0%). The age group of 60 and over
comprised 18.3% of the sample, followed by the 30-39 age group (8.9%) and the under 30 age group (2.1%). Over two-thirds (69.6%) of respondents were high school graduates/GED. Of the 19.3% who had a bachelor’s degree or higher, 8.2% were in Dietetics, 8.2% in Family and Consumer Sciences Education and Studies (FCEdS), and 7.5% in Hotel, Restaurant, and Institution Management (HRIM). The majority of respondents (62.9%) were not certified by the American School Food Service Association (ASFSA) or the Iowa School Food Service Association (ISFSA), nor were they registered dietitians (RD).

Work experience in SFS ranged from less than one year (4.6%) to over 20 years (22.9%). The majority of respondents had worked in SFS from 6 to 20 years (55.4%). Over half (51.1%) reported that they had been in their present positions for more than five years.

Respondents obtained nutrition education materials from commodity groups (87.5%), state government (86.8%), the United States Department of Agriculture (USDA) (70.4%), vendors (67.9%), and non-profit organizations (42.9%) (Table 2). They received nutrition education materials monthly (49.6%), followed by twice a month (18.2%), weekly (17.9%), twice a year (11.4%), and annually (2.9%).
Table 2. Sources of and frequency of receiving nutrition education materials (N=280)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group 1 (^a)</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Sources of nutrition education materials (^b)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commodity groups</td>
<td>58</td>
<td>85.3</td>
<td>138</td>
<td>86.8</td>
</tr>
<tr>
<td>State government</td>
<td>60</td>
<td>88.2</td>
<td>135</td>
<td>84.9</td>
</tr>
<tr>
<td>USDA</td>
<td>40</td>
<td>58.8</td>
<td>111</td>
<td>69.8</td>
</tr>
<tr>
<td>Vendors</td>
<td>41</td>
<td>60.3</td>
<td>111</td>
<td>69.8</td>
</tr>
<tr>
<td>Non-profit organizations</td>
<td>18</td>
<td>26.5</td>
<td>65</td>
<td>40.9</td>
</tr>
<tr>
<td>Frequency of receiving nutrition education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weekly</td>
<td>6</td>
<td>8.8</td>
<td>27</td>
<td>17.0</td>
</tr>
<tr>
<td>Twice a month</td>
<td>7</td>
<td>10.3</td>
<td>36</td>
<td>22.6</td>
</tr>
<tr>
<td>Monthly</td>
<td>40</td>
<td>58.8</td>
<td>78</td>
<td>49.1</td>
</tr>
<tr>
<td>Twice a year</td>
<td>11</td>
<td>16.2</td>
<td>15</td>
<td>9.4</td>
</tr>
<tr>
<td>Annually</td>
<td>4</td>
<td>5.9</td>
<td>3</td>
<td>1.9</td>
</tr>
</tbody>
</table>

\(^a\)Group 1=small school districts (n=68), group 2=medium school districts (n=159), and group 3=large school districts (n=53).

\(^b\)More than one response possible.

Analysis of background and district variables

Differences in Iowa public SFS district directors' background and district variables were examined. These variables included job title, age, education level, academic major, certification status, sources of nutrition education materials, and frequency of receiving nutrition education materials. Frequency distributions of background and district
variables to identify the level of normalcy of the distributions are shown in Appendix F. Results of the Kruskal-Wallis test indicated that respondents significantly differed in job title (p<0.001), age (p=0.012), education level (p<0.001), academic major (p<0.001), certification status (p<0.001), sources of nutrition education materials (p<0.001), and frequency of receiving nutrition education materials (p=0.001) (Table 3).

Results of the Mann-Whitney test indicated that job title was significantly different (p<0.001) based on the size of

Table 3. Results of the Kruskal-Wallis test for the background and district variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall Mean</th>
<th>Overall SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job title</td>
<td>2.55</td>
<td>1.75</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Age</td>
<td>3.58</td>
<td>0.96</td>
<td>0.012*</td>
</tr>
<tr>
<td>Education level</td>
<td>2.43</td>
<td>0.96</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Academic major</td>
<td>0.24</td>
<td>0.55</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Certification status</td>
<td>0.60</td>
<td>0.86</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Sources of nutrition education materials</td>
<td>3.55</td>
<td>1.21</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Frequency of receiving nutrition education materials</td>
<td>2.63</td>
<td>1.00</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

*Significant differences at p<0.05.
school district (Table 4). Respondents from the large school districts differed significantly (p<0.015) from small and medium school districts on education levels, academic majors, certification status, and sources of nutrition education materials. Respondents in large school districts had the

Table 4. Results of the Mann-Whitney test for the background and district variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Group 1*</th>
<th>Group 2*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job title</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>68</td>
<td>3.47</td>
<td>1.78</td>
<td>&lt;0.001*</td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td>159</td>
<td>2.52</td>
<td>1.74</td>
<td></td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Group 3</td>
<td>53</td>
<td>1.45</td>
<td>0.93</td>
<td>&lt;0.001*</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>67</td>
<td>3.67</td>
<td>0.92</td>
<td>0.848</td>
<td>0.004*</td>
</tr>
<tr>
<td>Group 2</td>
<td>158</td>
<td>3.68</td>
<td>0.90</td>
<td></td>
<td></td>
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<tr>
<td>Group 3</td>
<td>53</td>
<td>3.15</td>
<td>1.08</td>
<td>0.021</td>
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<tr>
<td>Education level</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
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<td>2.09</td>
<td>0.62</td>
<td>0.099</td>
<td>0.001*</td>
</tr>
<tr>
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<td>2.27</td>
<td>0.78</td>
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<td></td>
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<tr>
<td>Group 3</td>
<td>53</td>
<td>3.38</td>
<td>1.23</td>
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<td>&lt;0.001*</td>
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<tr>
<td>Academic major</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>0.35</td>
<td>0.658</td>
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</tr>
<tr>
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<td>159</td>
<td>0.14</td>
<td>0.44</td>
<td></td>
<td></td>
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<tr>
<td>Group 3</td>
<td>53</td>
<td>0.72</td>
<td>0.74</td>
<td>&lt;0.001*</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

*Group 1=small school districts, group 2=medium school districts, and group 3=large school districts.

*Using the Bonferroni method, p<0.017.
Table 4. (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Group 1*</th>
<th>Group 2*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>68</td>
<td>0.31</td>
<td>0.58</td>
<td>0.308</td>
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<tr>
<td>Group 2</td>
<td>159</td>
<td>0.45</td>
<td>0.75</td>
<td></td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Group 3</td>
<td>53</td>
<td>1.43</td>
<td>0.97</td>
<td></td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Sources of nutrition education materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Group 1</td>
<td>68</td>
<td>3.19</td>
<td>1.19</td>
<td>0.396</td>
<td>0.015*</td>
</tr>
<tr>
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<td>3.53</td>
<td>1.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 3</td>
<td>53</td>
<td>4.11</td>
<td>1.07</td>
<td>&lt;0.001*</td>
<td></td>
</tr>
<tr>
<td>Frequency of receiving nutrition education materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>68</td>
<td>3.00</td>
<td>0.93</td>
<td>0.014*</td>
<td>0.232</td>
</tr>
<tr>
<td>Group 2</td>
<td>159</td>
<td>2.57</td>
<td>0.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 3</td>
<td>53</td>
<td>2.36</td>
<td>1.11</td>
<td>0.015*</td>
<td></td>
</tr>
</tbody>
</table>

highest education level, were most often certified, and received the most nutrition education materials among the three groups. Frequencies of receiving nutrition education materials were significantly different between small and both the medium school districts (p=0.014) and large school districts (p=0.015). Respondents in medium school districts received nutrition education materials more often than in small school districts, but less frequently than in large school districts. Respondents' ages significantly differed
between medium and large school districts (p=0.004) with those in large school districts being younger than those in medium school districts. Because the largest cohort had the job title of SFS district director, that title will be used for the respondents.

Analysis of Nutrition Education Activities

SFS district directors provided information about their nutrition education activities. These nutrition education activities were examined in seven parts: discuss nutrition education materials, plan nutrition education activities, organize nutrition education workshops or training programs, discuss menus in relation to the Food Guide Pyramid (FGP), use of nutrition education materials, involvement in nutrition education activities, and analysis of differences in nutrition education activities.

Discuss nutrition education materials

Approximately 68% of respondents discussed nutrition education materials with SFS personnel about once a month or more (Table 5). Over half discussed nutrition education materials with students (59.6%), superintendents (58.6%), principals (57.9%), other school administrators (56.4%), and/or teachers (51.1%) about once a year or more. Over one-
Table 5. Discuss nutrition education materials (N=280)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFS personnel</td>
<td>3.51</td>
<td>2.18</td>
<td>27.9</td>
<td>15.0</td>
<td>6.4</td>
<td>18.6</td>
<td>8.2</td>
<td>8.9</td>
<td>15.0</td>
</tr>
<tr>
<td>Students</td>
<td>5.30</td>
<td>1.90</td>
<td>5.4</td>
<td>8.6</td>
<td>3.6</td>
<td>13.2</td>
<td>12.5</td>
<td>16.3</td>
<td>40.4</td>
</tr>
<tr>
<td>Superintendents</td>
<td>5.62</td>
<td>1.57</td>
<td>1.4</td>
<td>5.0</td>
<td>3.6</td>
<td>15.0</td>
<td>11.4</td>
<td>22.2</td>
<td>41.4</td>
</tr>
<tr>
<td>Principals</td>
<td>5.66</td>
<td>1.50</td>
<td>0.7</td>
<td>4.3</td>
<td>3.9</td>
<td>16.1</td>
<td>11.8</td>
<td>21.1</td>
<td>42.1</td>
</tr>
<tr>
<td>Other school administrators</td>
<td>5.56</td>
<td>1.63</td>
<td>1.1</td>
<td>6.1</td>
<td>4.6</td>
<td>15.3</td>
<td>13.6</td>
<td>15.7</td>
<td>43.6</td>
</tr>
<tr>
<td>Teachers</td>
<td>5.80</td>
<td>1.54</td>
<td>1.8</td>
<td>3.6</td>
<td>3.6</td>
<td>11.4</td>
<td>11.8</td>
<td>18.9</td>
<td>48.9</td>
</tr>
<tr>
<td>Nurses</td>
<td>5.99</td>
<td>1.48</td>
<td>1.1</td>
<td>2.5</td>
<td>4.3</td>
<td>11.0</td>
<td>10.0</td>
<td>11.8</td>
<td>59.3</td>
</tr>
<tr>
<td>Parents</td>
<td>6.18</td>
<td>1.30</td>
<td>0.7</td>
<td>1.8</td>
<td>1.8</td>
<td>10.0</td>
<td>7.9</td>
<td>16.4</td>
<td>61.4</td>
</tr>
<tr>
<td>School boards</td>
<td>6.40</td>
<td>0.97</td>
<td>0.4</td>
<td>0.4</td>
<td>0.4</td>
<td>5.0</td>
<td>8.6</td>
<td>22.0</td>
<td>63.2</td>
</tr>
</tbody>
</table>

*aScale: 1=daily, 2=weekly, 3=twice a month, 4=monthly, 5=twice a year, 6=annually, and 7=never.

third of respondents discussed nutrition education materials with nurses (40.7%), parents (38.6%), and/or school boards (36.8%) about once a year or more.

**Plan nutrition education activities**

Over two-fifths of respondents (41%) planned nutrition education activities with SFS personnel about twice a year or
more (Table 6). Respondents planned nutrition education activities with students (40.4%) and/or teachers (33.2%) about once a year or more. More than 70% of respondents never planned nutrition education activities with principals, superintendents, other school administrators, nurses, parents, and/or school boards.

Table 6. Plan nutrition education activities (N=280)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFS personnel</td>
<td>5.45</td>
<td>1.95</td>
<td>7.1</td>
<td>5.7</td>
<td>2.9</td>
<td>12.1</td>
<td>13.2</td>
<td>9.4</td>
<td>49.6</td>
</tr>
<tr>
<td>Students</td>
<td>6.04</td>
<td>1.47</td>
<td>2.2</td>
<td>2.1</td>
<td>2.9</td>
<td>8.2</td>
<td>11.8</td>
<td>13.2</td>
<td>59.6</td>
</tr>
<tr>
<td>Teachers</td>
<td>6.34</td>
<td>1.12</td>
<td>0.4</td>
<td>0.7</td>
<td>1.4</td>
<td>6.4</td>
<td>11.1</td>
<td>13.2</td>
<td>66.8</td>
</tr>
<tr>
<td>Principals</td>
<td>6.52</td>
<td>0.94</td>
<td>0.0</td>
<td>0.4</td>
<td>0.4</td>
<td>6.4</td>
<td>6.7</td>
<td>11.8</td>
<td>74.3</td>
</tr>
<tr>
<td>Superintendents</td>
<td>6.52</td>
<td>1.03</td>
<td>0.0</td>
<td>1.4</td>
<td>1.1</td>
<td>3.9</td>
<td>7.5</td>
<td>10.0</td>
<td>76.1</td>
</tr>
<tr>
<td>Other school administrators</td>
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<td>0.82</td>
<td>0.0</td>
<td>0.0</td>
<td>0.4</td>
<td>5.0</td>
<td>4.6</td>
<td>10.7</td>
<td>79.3</td>
</tr>
<tr>
<td>Nurses</td>
<td>6.66</td>
<td>0.84</td>
<td>0.3</td>
<td>0.3</td>
<td>0.4</td>
<td>2.9</td>
<td>4.6</td>
<td>10.4</td>
<td>81.1</td>
</tr>
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<td>Parents</td>
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<td>0.7</td>
<td>0.3</td>
<td>2.9</td>
<td>5.4</td>
<td>7.5</td>
<td>82.9</td>
</tr>
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<td>0.68</td>
<td>0.0</td>
<td>0.0</td>
<td>0.4</td>
<td>2.1</td>
<td>4.6</td>
<td>8.6</td>
<td>84.3</td>
</tr>
</tbody>
</table>

*Scale: 1=daily, 2=weekly, 3=twice a month, 4=monthly, 5=twice a year, 6=annually, and 7=never.*
Organize nutrition education workshops or training programs

Nutrition education workshops or training programs for SFS personnel were organized about once a year or more by 34.3% of respondents (Table 7). Less than 21% organized nutrition education workshops or training programs for students, teachers, nurses, superintendents, other school administrators, principals, parents, and/or school boards.

Table 7. Organize nutrition education workshops or training programs (N=280)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFS personnel</td>
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<td>1.1</td>
<td>1.1</td>
<td>1.1</td>
<td>7.5</td>
<td>11.0</td>
<td>12.5</td>
<td>65.7</td>
</tr>
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<td>Students</td>
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<td>0.4</td>
<td>0.0</td>
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<td>5.7</td>
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<tr>
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<td>0.0</td>
<td>0.0</td>
<td>0.4</td>
<td>0.7</td>
<td>2.5</td>
<td>7.1</td>
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<td>0.4</td>
<td>1.3</td>
<td>3.9</td>
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<td>0.4</td>
<td>0.7</td>
<td>0.0</td>
<td>0.0</td>
<td>1.1</td>
<td>3.9</td>
<td>93.9</td>
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<td>0.4</td>
<td>5.0</td>
<td>4.6</td>
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<td>0.7</td>
<td>0.7</td>
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<td>93.2</td>
</tr>
<tr>
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<td>0.33</td>
<td>0.0</td>
<td>0.0</td>
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<td>0.0</td>
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<td>3.9</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.4</td>
<td>4.3</td>
<td>95.4</td>
</tr>
</tbody>
</table>

*Scale: 1=daily, 2=weekly, 3=twice a month, 4=monthly, 5=twice a year, 6=annually, and 7=never.*
Discuss menus in relation to the Food Guide Pyramid

Over half of respondents (58.2%) discussed menus in relation to the Food Guide Pyramid (FGP) with SFS personnel about once a month or more, and 43.9% with students about once a year or more (Table 8). Over one-fourth of respondents discussed them with superintendents (28.6%) and/or teachers (28.2%) about once a year or more. Nearly 25% discussed them

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<th>Variable</th>
<th>Mean*</th>
<th>SD</th>
<th>1</th>
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<tbody>
<tr>
<td>SFS personnel</td>
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</tr>
<tr>
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<td>2.5</td>
<td>2.5</td>
<td>2.5</td>
<td>10.4</td>
<td>11.0</td>
<td>15.0</td>
<td>56.1</td>
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<tr>
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<td>1.5</td>
<td>4.6</td>
<td>5.7</td>
<td>14.6</td>
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</tr>
<tr>
<td>Teachers</td>
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<td>1.00</td>
<td>0.4</td>
<td>0.7</td>
<td>0.7</td>
<td>3.9</td>
<td>8.6</td>
<td>13.9</td>
<td>71.8</td>
</tr>
<tr>
<td>Principals</td>
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<td>3.9</td>
<td>5.7</td>
<td>12.5</td>
<td>75.4</td>
</tr>
<tr>
<td>Nurses</td>
<td>6.61</td>
<td>1.00</td>
<td>0.7</td>
<td>1.1</td>
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<td>3.2</td>
<td>4.3</td>
<td>9.6</td>
<td>80.7</td>
</tr>
<tr>
<td>Other school administrators</td>
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<td>0.7</td>
<td>1.1</td>
<td>2.9</td>
<td>4.6</td>
<td>10.7</td>
<td>80.0</td>
</tr>
<tr>
<td>Parents</td>
<td>6.68</td>
<td>0.77</td>
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<td>0.4</td>
<td>0.7</td>
<td>2.5</td>
<td>3.5</td>
<td>12.5</td>
<td>80.4</td>
</tr>
<tr>
<td>School boards</td>
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<td>0.0</td>
<td>0.0</td>
<td>0.4</td>
<td>1.4</td>
<td>3.2</td>
<td>10.7</td>
<td>84.3</td>
</tr>
</tbody>
</table>

*Scale: 1=daily, 2=weekly, 3=twice a month, 4=monthly, 5=twice a year, 6=annually, and 7=never.
with principals about once a year or more. Over 80% never discussed menus in relation to the FGP with nurses, other school administrators, parents, and/or school boards.

**Use of nutrition education materials**

Approximately 45% of respondents used posters about once a month or more and newsletters about twice a year or more (Table 9). Over one-third of respondents used brochures (39.3%) and/or flyers (36.4%) about twice a year or more. Videotapes were used about once a year or more by 26.1% of respondents. Less than 20% of respondents used computers, audiotapes, CD-ROMs, televisions, and/or table tents.

Table 9. Use of nutrition education materials (N=280)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean⁹</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posters</td>
<td>4.64</td>
<td>1.97</td>
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<td>3.2</td>
<td>2.5</td>
<td>26.4</td>
<td>18.9</td>
<td>9.4</td>
<td>25.7</td>
</tr>
<tr>
<td>Newsletters</td>
<td>5.49</td>
<td>1.57</td>
<td>1.4</td>
<td>2.9</td>
<td>3.6</td>
<td>26.1</td>
<td>11.8</td>
<td>12.1</td>
<td>42.1</td>
</tr>
<tr>
<td>Brochures</td>
<td>5.61</td>
<td>1.61</td>
<td>1.4</td>
<td>4.3</td>
<td>4.6</td>
<td>17.9</td>
<td>11.1</td>
<td>15.0</td>
<td>45.7</td>
</tr>
<tr>
<td>Flyers</td>
<td>5.80</td>
<td>1.60</td>
<td>1.4</td>
<td>3.9</td>
<td>2.9</td>
<td>16.8</td>
<td>11.4</td>
<td>7.5</td>
<td>56.1</td>
</tr>
<tr>
<td>Videotapes</td>
<td>6.53</td>
<td>0.95</td>
<td>0.0</td>
<td>0.7</td>
<td>1.1</td>
<td>3.6</td>
<td>8.2</td>
<td>12.5</td>
<td>73.9</td>
</tr>
</tbody>
</table>

⁹Scale: 1=daily, 2=weekly, 3=twice a month, 4=monthly, 5=twice a year, 6=annually, and 7=never.
Table 9. (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean(^{a})</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computers</td>
<td>6.36</td>
<td>1.59</td>
<td>4.3</td>
<td>2.9</td>
<td>1.4</td>
<td>3.6</td>
<td>1.4</td>
<td>4.6</td>
<td>81.8</td>
</tr>
<tr>
<td>Audiotapes</td>
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<td>0.0</td>
<td>0.4</td>
<td>2.1</td>
<td>4.6</td>
<td>8.6</td>
<td>83.2</td>
</tr>
<tr>
<td>CD-ROMs</td>
<td>6.79</td>
<td>0.78</td>
<td>0.4</td>
<td>0.7</td>
<td>0.4</td>
<td>2.1</td>
<td>0.7</td>
<td>6.4</td>
<td>89.3</td>
</tr>
<tr>
<td>Televisions</td>
<td>6.80</td>
<td>0.90</td>
<td>1.4</td>
<td>0.4</td>
<td>0.4</td>
<td>1.4</td>
<td>0.7</td>
<td>2.1</td>
<td>93.6</td>
</tr>
<tr>
<td>Table tents</td>
<td>6.85</td>
<td>0.68</td>
<td>0.4</td>
<td>0.4</td>
<td>0.0</td>
<td>2.1</td>
<td>1.4</td>
<td>1.8</td>
<td>93.9</td>
</tr>
</tbody>
</table>

Involvement in nutrition education activities

Over 45% of respondents involved students in the preparation of nutritious meals in the school cafeteria (47.9%) and/or used marketing activities to promote healthy eating habits (45.7%) about once a year or more (Table 10). Approximately 30% of respondents taught nutrition education in the classroom about once a year or more. Slightly less than one-fourth of respondents developed nutrition education materials for classroom use.

Analysis of differences in nutrition education activities

Nutrition education activities include six items. These are: discuss nutrition education materials (Item 13), plan
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use marketing activities to promote healthy eating habits</td>
<td>5.87</td>
<td>1.61</td>
<td>3.9</td>
<td>2.1</td>
<td>1.8</td>
<td>11.1</td>
<td>12.5</td>
<td>14.3</td>
<td>54.3</td>
</tr>
<tr>
<td>Involve students in the preparation of nutritious meals in the school cafeteria</td>
<td>6.09</td>
<td>1.30</td>
<td>1.8</td>
<td>1.1</td>
<td>1.1</td>
<td>8.9</td>
<td>9.3</td>
<td>25.7</td>
<td>52.1</td>
</tr>
<tr>
<td>Teach NED in the classroom</td>
<td>6.44</td>
<td>1.04</td>
<td>0.4</td>
<td>1.0</td>
<td>0.7</td>
<td>4.3</td>
<td>8.6</td>
<td>15.7</td>
<td>69.3</td>
</tr>
<tr>
<td>Develop NED materials for classroom use</td>
<td>6.62</td>
<td>0.88</td>
<td>0.3</td>
<td>0.3</td>
<td>0.7</td>
<td>2.9</td>
<td>5.0</td>
<td>12.9</td>
<td>77.9</td>
</tr>
</tbody>
</table>

*Scale: 1=daily, 2=weekly, 3=twice a month, 4=monthly, 5=twice a year, 6=annually, and 7=never.*

Nutrition education activities (Item 14), organize nutrition education workshops or training programs (Item 15), discuss menus in relation to the FGP (Item 16), use of nutrition education materials (Item 17), and involvement in nutrition education activities (Item 18). Differences in nutrition education activities of SFS district directors among small, medium, and large school districts were examined.
Frequency distributions of nutrition education activity variables show that data were not from normal populations with equal variances (Appendix F). Results from the Kruskal-Wallis test indicated that there were significant differences on Items 14 (p=0.025), 15 (p<0.001), 17(p=0.040), and 18 (p<0.001) among the three groups (Table 11). No significant differences were found on Items 13 (p=0.311) and 16 (p=0.732). Findings indicate that respondents significantly differed in planning nutrition education activities, organizing nutrition education workshops or training programs, use of nutrition education materials, and involvement in nutrition education activities among the three groups.

Table 11. Results of the Kruskal-Wallis test for nutrition education activities (N=280)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Label</th>
<th>Overall Mean</th>
<th>Overall SD</th>
<th>p value</th>
</tr>
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<tr>
<td>Item 13</td>
<td>Discuss NED materials</td>
<td>5.56</td>
<td>1.13</td>
<td>0.311</td>
</tr>
<tr>
<td>Item 14</td>
<td>Plan NED activities</td>
<td>6.40</td>
<td>0.77</td>
<td>0.025*</td>
</tr>
<tr>
<td>Item 15</td>
<td>Organize NED workshops</td>
<td>6.81</td>
<td>0.37</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>Item 16</td>
<td>Discuss menus &amp; FGP</td>
<td>6.26</td>
<td>0.77</td>
<td>0.732</td>
</tr>
<tr>
<td>Item 17</td>
<td>NED materials</td>
<td>6.15</td>
<td>0.79</td>
<td>0.040*</td>
</tr>
<tr>
<td>Item 18</td>
<td>NED activities</td>
<td>6.25</td>
<td>0.86</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

*Significant differences at p<0.05.
Results from the Mann-Whitney test indicated that SFS district directors' responses differed significantly (p<0.01) on Items 15, 17, and 18 between small and large school districts (Table 12). SFS district directors in medium and large school districts differed significantly (p<0.01) on Items 14, 15, and 18. No significant differences were found in the involvement in nutrition education activities between SFS district directors in small and medium school districts. SFS district directors in large school districts participated in these nutrition education activities and used these nutrition education materials most often among the three groups.

Analysis of Attitudes Toward Nutrition Education

Four major concepts were developed for the nutrition education attitude inventory. These included importance of nutrition education in SFS programs (Concept 1), individuals involved in nutrition education (Concept 2), difficulties in implementing nutrition education (Concept 3), and use of FGP in nutrition education (Concept 4). A total of 24 attitude items were constructed to determine Iowa public SFS district directors' attitudes toward nutrition education. Attitude items in each concept contained Items 1 to 4 for Concept 1,
Table 12. Results of the Mann-Whitney test for nutrition education activities (N=280)

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
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<th>SD</th>
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<th>Group 2</th>
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</thead>
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<td>Item 13</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
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<td>5.71</td>
<td>1.13</td>
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</tr>
<tr>
<td>Group 2</td>
<td>159</td>
<td>5.48</td>
<td>1.16</td>
<td>0.133</td>
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<tr>
<td>Group 3</td>
<td>53</td>
<td>5.59</td>
<td>1.03</td>
<td>0.343</td>
<td>0.698</td>
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<tr>
<td>Item 14</td>
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<td>Group 1</td>
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<td>6.38</td>
<td>0.85</td>
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<td>Group 3</td>
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<td>0.70</td>
<td>0.039</td>
<td>0.007*</td>
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<td>68</td>
<td>6.83</td>
<td>0.37</td>
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<td>Group 2</td>
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<td>0.39</td>
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<td>&lt;0.001*</td>
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<td>Item 16</td>
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<td>Group 1</td>
<td>68</td>
<td>6.25</td>
<td>0.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td>159</td>
<td>6.26</td>
<td>0.79</td>
<td>0.732</td>
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<tr>
<td>Group 3</td>
<td>53</td>
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<td>0.66</td>
<td>0.459</td>
<td>0.534</td>
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<td></td>
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<tr>
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<td>6.36</td>
<td>0.56</td>
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<td></td>
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<td>6.11</td>
<td>0.88</td>
<td>0.143</td>
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<td>0.70</td>
<td>0.009*</td>
<td>0.129</td>
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<td>Item 18</td>
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<tr>
<td>Group 2</td>
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<td>6.32</td>
<td>0.82</td>
<td>0.150</td>
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</tr>
<tr>
<td>Group 3</td>
<td>53</td>
<td>5.80</td>
<td>0.89</td>
<td>&lt;0.001*</td>
<td>&lt;0.001*</td>
</tr>
</tbody>
</table>

*Group 1=small school districts, group 2=medium school districts, and group 3=large school districts.

*Using the Bonferroni method, p<0.017.
Items 5 to 14 for Concept 2, Items 15 to 19 for Concept 3, and Items 20 to 24 for Concept 4.

Reliability tests were computed for each concept and the overall attitude inventory. The coefficient of reliability for the attitude inventory was $r=0.85$ (Table 13). The overall mean score of the attitude inventory was 3.76 with a standard deviation of 0.41. For Concepts 1, 2, 3, and 4, the coefficients of reliability were $r=0.69$, $r=0.73$, $r=0.37$, and $r=0.79$, respectively. The low coefficient of reliability for Concept 3 indicates that respondents had a wide range of attitudes toward difficulties in implementing nutrition education. The mean scores of attitude items for Concepts 1, 2, 3, and 4 were 4.12 (SD=0.69), 3.75 (SD=0.47), 3.04 (SD=0.54), and 4.18 (SD=0.52), respectively.

Table 13. Means, standard deviations, and coefficients of reliability for attitude responses

<table>
<thead>
<tr>
<th>Concept</th>
<th>Item No.</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>Cronbach's alpha</th>
</tr>
</thead>
<tbody>
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<td>1 - 4</td>
<td>279</td>
<td>4.12</td>
<td>0.69</td>
<td>0.69</td>
</tr>
<tr>
<td>2</td>
<td>5 - 14</td>
<td>277</td>
<td>3.75</td>
<td>0.47</td>
<td>0.73</td>
</tr>
<tr>
<td>3</td>
<td>15 - 19</td>
<td>276</td>
<td>3.04</td>
<td>0.54</td>
<td>0.37</td>
</tr>
<tr>
<td>4</td>
<td>20 - 24</td>
<td>276</td>
<td>4.18</td>
<td>0.52</td>
<td>0.79</td>
</tr>
<tr>
<td>Total Inventory</td>
<td>1 - 24</td>
<td>271</td>
<td>3.76</td>
<td>0.41</td>
<td>0.85</td>
</tr>
</tbody>
</table>
Among the standard deviations in Table 14, those for Items 1, 10, 11, 16, 18, and 19 were greater than 1.00, reflecting respondents' wide range of attitudes toward these items. These items included Item 1 (mean=4.00, SD=1.20), "It is not important to provide students with nutrition information;" Item 10 (mean=3.26, SD=1.06), "Students are not interested in nutrition information;" Item 11 (mean=3.44, SD=1.08), "The school administration doesn't support nutrition education activities in the SFS program;" Item 16 (mean=3.06, SD=1.14), "I don't feel competent to teach nutrition education;" Item 18 (mean=2.29, SD=1.13), "There isn't time to discuss nutrition education with students;" and Item 19 (mean=3.33, SD=1.01), "Qualified SFS staff is required to implement nutrition education." Responses on these items may imply that respondents did not feel positive or comfortable with their concerns about students' interest in nutrition education. Further concerns might have been over their qualifications and competencies in teaching nutrition education, and the availability of time and support for involvement in nutrition education activities.

In general, SFS district directors did not have positive attitudes toward Item 15 (mean=2.44, SD=0.96), "Special funding is required to provide nutrition education activities," and Item 18 (mean=2.29, SD=1.13), "There isn't
Table 14. Attitude responses by item

<table>
<thead>
<tr>
<th>Item</th>
<th>Label</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Provide nutrition information</td>
<td>280</td>
<td>4.00</td>
<td>1.20</td>
</tr>
<tr>
<td>2</td>
<td>Healthy food choice</td>
<td>280</td>
<td>4.42</td>
<td>0.82</td>
</tr>
<tr>
<td>3</td>
<td>SFS learning environment for NED</td>
<td>279</td>
<td>4.03</td>
<td>0.90</td>
</tr>
<tr>
<td>4</td>
<td>SFS significant part of NED</td>
<td>280</td>
<td>4.05</td>
<td>0.93</td>
</tr>
<tr>
<td>5</td>
<td>My responsibility to provide NED</td>
<td>280</td>
<td>3.62</td>
<td>0.98</td>
</tr>
<tr>
<td>6</td>
<td>Parents' responsibility for NED</td>
<td>280</td>
<td>4.15</td>
<td>0.80</td>
</tr>
<tr>
<td>7</td>
<td>Teachers' responsibility for NED</td>
<td>280</td>
<td>3.94</td>
<td>0.73</td>
</tr>
<tr>
<td>8</td>
<td>SFS responsibility for NED</td>
<td>279</td>
<td>3.84</td>
<td>0.84</td>
</tr>
<tr>
<td>9</td>
<td>Involved in NED curriculum</td>
<td>280</td>
<td>3.80</td>
<td>0.91</td>
</tr>
<tr>
<td>10</td>
<td>Student interested in NED</td>
<td>279</td>
<td>3.26</td>
<td>1.06</td>
</tr>
<tr>
<td>11</td>
<td>School adm support NED in SFS</td>
<td>280</td>
<td>3.44</td>
<td>1.08</td>
</tr>
<tr>
<td>12</td>
<td>Work with teachers in NED</td>
<td>280</td>
<td>4.00</td>
<td>0.72</td>
</tr>
<tr>
<td>13</td>
<td>Parents involved in NED</td>
<td>279</td>
<td>3.90</td>
<td>0.92</td>
</tr>
<tr>
<td>14</td>
<td>Participate in planning NED</td>
<td>280</td>
<td>3.59</td>
<td>0.78</td>
</tr>
<tr>
<td>15</td>
<td>Special funding required in NED</td>
<td>279</td>
<td>2.44</td>
<td>0.96</td>
</tr>
<tr>
<td>16</td>
<td>Competent in NED</td>
<td>280</td>
<td>3.06</td>
<td>1.14</td>
</tr>
<tr>
<td>17</td>
<td>Knowledge in healthy food choice</td>
<td>279</td>
<td>4.05</td>
<td>0.75</td>
</tr>
<tr>
<td>18</td>
<td>Time for NED with students</td>
<td>277</td>
<td>2.29</td>
<td>1.13</td>
</tr>
</tbody>
</table>

*aScale: 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly disagree.

*Items were constructed in a negative orientation and the raw data were reversed.
Table 14. (continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>Label</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Qualified SFS to implement NED</td>
<td>280</td>
<td>3.33</td>
<td>1.01</td>
</tr>
<tr>
<td>20b</td>
<td>FGP important to student</td>
<td>280</td>
<td>4.24</td>
<td>0.72</td>
</tr>
<tr>
<td>21</td>
<td>FGP taught in classroom</td>
<td>280</td>
<td>4.17</td>
<td>0.76</td>
</tr>
<tr>
<td>22</td>
<td>NED reinforces the use of FGP</td>
<td>277</td>
<td>4.09</td>
<td>0.70</td>
</tr>
<tr>
<td>23</td>
<td>Use FGP to teach NED</td>
<td>279</td>
<td>4.22</td>
<td>0.61</td>
</tr>
<tr>
<td>24b</td>
<td>FGP knowledge</td>
<td>280</td>
<td>4.15</td>
<td>0.75</td>
</tr>
</tbody>
</table>

Some respondents provided comments about difficulties in implementing nutrition education in SFS programs including lack of time and support from students' family members and teachers (Appendix G).

**Analysis of differences in nutrition education attitudes**

SFS district directors' attitudes toward nutrition education in small, medium, and large school districts were examined. SFS district directors' attitude responses on each concept and the overall nutrition education attitude inventory were compared by groups. Frequency distributions of each nutrition education concept are shown in Appendix F.
Results of the Kruskal-Wallis test indicated that SFS district directors' attitude responses on Concept 1 (p=0.006), Concept 3 (p=0.005), Concept 4 (p=0.002), and the overall nutrition education attitude inventory (p=0.001) were significantly different among the three groups (Table 15). No significant differences were found on Concept 2 (p=0.154).

Table 15. Results of the Kruskal-Wallis test for nutrition education attitude responses

<table>
<thead>
<tr>
<th>Variable Label</th>
<th>N</th>
<th>Overall Mean</th>
<th>Overall SD</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept 1 Implement NED in SFS</td>
<td>279</td>
<td>4.12</td>
<td>0.69</td>
<td>0.006*</td>
</tr>
<tr>
<td>Concept 2 People involved in NED</td>
<td>277</td>
<td>3.75</td>
<td>0.47</td>
<td>0.154</td>
</tr>
<tr>
<td>Concept 3 Difficulties in NED</td>
<td>276</td>
<td>3.04</td>
<td>0.54</td>
<td>0.005*</td>
</tr>
<tr>
<td>Concept 4 FGP &amp; NED</td>
<td>276</td>
<td>4.18</td>
<td>0.52</td>
<td>0.002*</td>
</tr>
<tr>
<td>Attmean Mean of Items 1-24</td>
<td>271</td>
<td>3.76</td>
<td>0.41</td>
<td>0.001*</td>
</tr>
</tbody>
</table>

*Attmean=Mean scores of total attitude items.
*Significant differences at p<0.05.

Findings from the Mann-Whitney test indicated that SFS district directors in small and large districts significantly differed in their attitude responses on Concept 3 (p=0.005), Concept 4 (p<0.001), and the overall nutrition education attitude inventory (p=0.003) (Table 16). In addition, SFS
Table 16. Results of the Mann-Whitney test for nutrition education attitude responses

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Group 1*</th>
<th>Group 2</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>68</td>
<td>4.11</td>
<td>0.67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td>158</td>
<td>4.05</td>
<td>0.70</td>
<td>0.554</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 3</td>
<td>53</td>
<td>4.38</td>
<td>0.64</td>
<td>0.020</td>
<td>0.002*</td>
<td></td>
</tr>
<tr>
<td>Concept 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>66</td>
<td>3.76</td>
<td>0.51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td>159</td>
<td>3.72</td>
<td>0.45</td>
<td>0.546</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 3</td>
<td>52</td>
<td>3.86</td>
<td>0.48</td>
<td>0.248</td>
<td>0.052</td>
<td></td>
</tr>
<tr>
<td>Concept 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>66</td>
<td>2.95</td>
<td>0.54</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td>157</td>
<td>2.99</td>
<td>0.52</td>
<td>0.933</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 3</td>
<td>53</td>
<td>3.28</td>
<td>0.56</td>
<td>0.005*</td>
<td>0.002*</td>
<td></td>
</tr>
<tr>
<td>Concept 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>68</td>
<td>4.06</td>
<td>0.55</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td>157</td>
<td>4.16</td>
<td>0.49</td>
<td>0.284</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 3</td>
<td>51</td>
<td>4.40</td>
<td>0.49</td>
<td>&lt;0.001*</td>
<td>0.003*</td>
<td></td>
</tr>
<tr>
<td>Attmeanb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 1</td>
<td>65</td>
<td>3.72</td>
<td>0.42</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td>155</td>
<td>3.72</td>
<td>0.40</td>
<td>0.911</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 3</td>
<td>51</td>
<td>3.94</td>
<td>0.41</td>
<td>0.003*</td>
<td>&lt;0.001*</td>
<td></td>
</tr>
</tbody>
</table>

*Group 1=small school districts, group 2=medium school districts, and group 3=large school districts.

bAttmean=Mean scores of total attitude items.

*Using the Bonferroni method, p<0.017.
district directors' attitude responses on Concept 1 (p=0.002), Concept 3 (p=0.002), Concept 4 (p=0.003), and the overall nutrition education attitudes (p<0.001) were significantly different between medium and large school districts. SFS district directors' attitude responses were not significantly different between small and medium school districts as a possible result of their similar backgrounds.

Discussion

Results from an analysis of Iowa public SFS district directors' background information indicate that differences existed in SFS district directors' job title, age, education level, academic major, certification status, and sources of and frequency of receiving nutrition education materials among small, medium, and large school districts. In large and medium school districts, a job title of FS director was most reported. In small school districts, head cook was the job title most used. Most of the SFS district directors in large school districts had a college degree in Dietetics, FCEdS, and/or HRIM, and were certified by ASFSA or ISFSA. In general, SFS district directors in small and medium school districts were high school graduates and not certified. Of the three groups, SFS district directors in large school districts received the most nutrition education materials.
SFS district directors in medium school districts received nutrition education materials more often than SFS district directors in small school districts.

These background differences may have an important impact on the significant differences found in the analyses of nutrition education activities and nutrition education attitudes of SFS district directors in small, medium, and large school districts. In large school districts, SFS district directors may be provided with more training opportunities and resources for nutrition education. Therefore, they feel more competent and motivated to participate in nutrition education activities.

Analysis of nutrition education activities indicates that SFS district directors performed most nutrition education activities with SFS personnel and students. SFS district directors seldom participated in nutrition education activities with nurses, other school administrators, parents, principals, school boards, superintendents, and/or teachers. The most frequently used materials in nutrition education were posters, newsletters, brochures, and flyers in descending order. As a result of better access to nutrition education resources, SFS district directors in large school districts used more nutrition education materials and participated in
more nutrition education activities than SFS district directors in small and medium school districts.

Between small and large school districts, SFS district directors significantly differed in organizing nutrition education workshops or training programs, use of nutrition education materials, and involvement in nutrition education activities. SFS district directors in large school districts performed these nutrition education activities more often than SFS district directors in small school districts. Also, SFS district directors in large school districts planned nutrition education activities, organized nutrition education workshops or training programs, and were involved in nutrition education activities more often than SFS district directors in medium school districts. These positive differences in nutrition education activities may be associated with SFS district directors' job title, education level, certification status, and frequency of receiving nutrition education materials. SFS district directors' nutrition education activities between small and medium school districts were not significantly different as a result of their similar backgrounds and nutrition education experiences.

Results from analyzing SFS district directors' responses on nutrition education attitude indicate that SFS district directors generally had positive attitudes toward nutrition
education. SFS district directors recognized the importance of nutrition education. Attitude items related to the difficulties in implementing nutrition education were more likely to be responded to in a neutral way. These responses may reflect SFS district directors' discomforts in expressing their personal concerns about implementing nutrition education in SFS programs.

SFS district directors in large school districts had more positive attitudes toward nutrition education than SFS district directors in small and medium school districts. They also had more positive attitudes toward facing difficulties in implementing nutrition education and teaching the FGP in SFS programs than SFS district directors in small and medium school districts. SFS district directors' responses on the importance of implementing nutrition education in SFS programs were significantly different between medium and large school districts. Overall, attitudes toward nutrition education of SFS district directors were not significantly different between small and medium school districts. Differences found in SFS district directors' backgrounds among the three groups such as job title, education level, certification status, and frequency of receiving nutrition education materials may have an important impact on SFS district directors' attitudes toward nutrition education.
CHAPTER 5. SUMMARY AND RECOMMENDATIONS

Summary

The purpose of this study was to determine the extent to which the Iowa public school food service (SFS) district directors incorporated nutrition education into SFS programs. Specific objectives were to:

1. Observe the extent to which Iowa private SFS directors incorporate nutrition education into SFS programs and obtain in-depth information to develop a self-administered instrument for use with district directors in Iowa public SFS programs.

2. Examine the extent to which Iowa public SFS district directors use nutrition education activities.

3. Determine attitudes of Iowa public SFS district directors toward nutrition education.

4. Determine whether Iowa public SFS district directors differ on background and district variables including attitudes toward nutrition education and incorporation of nutrition education activities.

A preliminary qualitative study was conducted with 12 Iowa private SFS district directors to obtain in-depth information about nutrition education activities in SFS programs. The resulting information was used to develop a questionnaire for this study. The questionnaire consisted of
three parts: demographic information, nutrition education activities, and attitudes toward nutrition education. The questionnaire was pilot tested, revised, and mailed to 377 Iowa public SFS district directors. The return rate was 74.3, representing 280 Iowa public SFS district directors in 68 small school districts, 159 medium school districts, and 53 large school districts.

Data were analyzed using Release 6.0 of the Statistical Package for the Social Sciences (SPSS). Descriptive statistics including frequencies, means, and standard deviations were computed for each variable. The Kruskal-Wallis test, the Mann-Whitney test, and the Bonferroni method were used to determine if respondents significantly differed in their backgrounds, nutrition education activities, and attitudes toward nutrition education among small, medium, and large school districts.

Demographic characteristics

The majority of respondents were female, high school graduates, aged 40 to 59, not certified, and with over 6 years of SFS work experience. Seven out of ten respondents reported no mission statement related to nutrition education in their district SFS programs. Three major sources of nutrition education materials were: commodity groups, state government,
and the United States Department of Agriculture. In general, nutrition education materials were received on a monthly basis.

Results of the study indicated that Iowa public SFS district directors in small, medium, and large school districts significantly differed in their backgrounds: job title, age, education level, academic major, certification status, and sources of and frequency of receiving nutrition education materials. The majority of respondents in large school districts had a job title of SFS director, a college degree, and were certified. They had better access to nutrition education materials and received them more often than the respondents in small and medium school districts. Over half of respondents in small school districts had a job title of head cook. They received fewer nutrition education materials than in medium school districts.

Nutrition education activities

Nutrition education activities consisted of six parts: discuss nutrition education materials, plan nutrition education activities, organize nutrition education workshops or training programs, discuss menus in relation to the Food Guide Pyramid (FGP), use of nutrition education materials, and involvement in nutrition education activities. Responses were
recorded as 1=daily, 2=weekly, 3=twice a month, 4=monthly, 5=twice a year, 6=annually, or 7=never.

Findings indicate that Iowa public SFS district directors most frequently performed nutrition education activities with SFS personnel and students. The most frequent nutrition education activities engaged in by respondents and SFS personnel were: discuss nutrition education materials (twice a month) and discuss menus in relation to the FGP (monthly). Respondents discussed nutrition education materials with students about twice a year, planned nutrition education activities with students about once a year, and discussed menus in relation to the FGP with students about once a year. Nurses, principals, school boards, superintendents, other school administrators, teachers, and/or parents seldom were involved in the delivery of nutrition education in SFS programs.

Nutrition education materials used most frequently were posters, newsletters, brochures, and flyers (in descending order). Nearly half of respondents involved students in the preparation of nutritious meals in the school cafeteria and/or used marketing activities to promote healthy eating habits. Less than one-third of respondents taught nutrition education in the classroom and/or developed nutrition education materials for classroom use. Iowa public SFS district
directors' responses about planning nutrition education activities, organizing nutrition education workshops or training programs, use of nutrition education materials, and/or involvement in nutrition education activities were significantly different among small, medium, and large school districts. Respondents in large school districts performed these nutrition education activities most often among the three groups. Nutrition education activities were not significantly different between small and medium school districts.

**Nutrition education attitudes**

A total of 24 nutrition education attitude items, using a five-point Likert-type scale format (1=strongly disagree to 5=strongly agree), were developed into an inventory to determine Iowa public SFS district directors' attitudes toward nutrition education. The attitude inventory consisted of four major concepts: importance of nutrition education in SFS programs, individuals involvement in nutrition education, difficulties in implementing nutrition education, and use of the FGP in nutrition education. The coefficient of reliability for the attitude inventory was r=0.85.

Results of analyses indicate that Iowa public SFS district directors had positive attitudes toward nutrition
education (mean=3.76). The importance of incorporating nutrition education into SFS programs was well recognized. Lack of funding and time for nutrition education were identified as difficulties in implementing nutrition education in SFS programs.

Attitudes toward nutrition education of Iowa public SFS district directors were significantly different among small, medium, and large school districts. Respondents in large school districts had more positive nutrition education attitudes than in small and medium school districts. Respondents' attitudes toward nutrition education were not significantly different between small and medium school districts.

Factors affecting implementing nutrition education

Results of the study indicate that the size of the school districts may have an impact on the distribution of nutrition education resources, leading to the differences in Iowa public SFS district directors' nutrition education activities and nutrition education attitudes. Notable differences in demographic information, nutrition education activities, and nutrition education attitudes were found in the comparison of respondents in large school districts with small and medium school districts. The availability of nutrition education
resources in large school districts may positively influence the involvement of respondents in nutrition education activities and their attitudes toward nutrition education. In the attitude responses toward nutrition education, concerns about lack of time and financial constraints for nutrition education, students' interest in nutrition education, and qualifications and competencies in teaching nutrition education were addressed. Any of these also may affect the implementation of nutrition education in SFS programs. These are some of the challenging factors in extending and enhancing nutrition education in SFS programs into the 21st century.

**Recommendations**

Based on the findings from this study, the following recommendations are made for further study:

1. Survey Iowa SFS district directors regarding needs for nutrition education training and provide them with opportunities to attend nutrition education training programs to enhance their competencies in nutrition education. The federal government, state government, private businesses, and community agencies could be approached for funding for such programs.

2. Identify difficulties of Iowa SFS district directors' ability to obtain and apply nutrition education materials.
The findings can be used to enhance the distribution and utilization of nutrition education materials.

3. Identify other obstacles that may impede Iowa SFS district directors from implementing nutrition education in SFS programs.
APPENDIX A. HUMAN SUBJECTS APPROVAL FORM
Checklist for Attachments and Time Schedule

The following are attached (please check):

12. □ Letter or written statement to subjects indicating clearly:
   a) purpose of the research
   b) the use of any identifier codes (names, #’s), how they will be used, and when they will be removed (see Item 17)
   c) an estimate of time needed for participation in the research and the place
   d) if applicable, location of the research activity
   e) how you will ensure confidentiality
   f) in a longitudinal study, note when and how you will contact subjects later
   g) participation is voluntary; nonparticipation will not affect evaluations of the subject

13. □ Consent form (if applicable)

14. □ Letter of approval for research from cooperating organizations or institutions (if applicable)

15. □ Data-gathering instruments

16. Anticipated dates for contact with subjects:

   First Contact
   April 8, 1996

   Last Contact
   May 31, 1996

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

   December 31, 1996

18. Signature of Departmental Executive Officer

   Date
   3/1/96

   Department or Administrative Unit
   HRIM
   FCEdS

19. Decision of the University Human Subjects Review Committee:

   □ Project Approved
   ____ Project Not Approved
   ____ No Action Required

   Patricia M. Keith
   Name of Committee Chairperson

   Date
   4/4/96

   Signature of Committee Chairperson
APPENDIX B. PRELIMINARY QUALITATIVE STUDY
INTRODUCTION

The National School Lunch Program (NSLP) was instituted in 1946 in a statute which reads "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 food..." (National School Lunch Act of 1946, p. 230). Since then, school lunch programs have been initiated to improve the health and well-being of school-age children (Nestor & Glotzer, 1981).

All students are encouraged to participate in school lunch programs to obtain nutritious meals and learn healthy eating habits. These habits can be developed in school by applying principles of learning, using effective educational techniques, and creating an appreciation for foods. School food services "can function as laboratories for applying nutrition principles taught in classrooms" (The White House Conference on Food, Nutrition, and Health, 1970, p. 25). The director of the school food service oversees nutritious meals and incorporates nutrition education to assist students in developing healthy food attitudes and making wise food choices, not only for the present but also for a lifetime (Neill, 1981).
Because of the importance of reaching school-age children with nutrition education information, a joint statement has been developed by three prestigious professional groups:

It is the position of the Society for Nutrition Education, The American Dietetic Association, and the American School Food Service Association that comprehensive school-based nutrition programs and services be provided to all the nation's elementary and secondary students. These programs and services include effective education in foods and nutrition; a school environment that provides opportunity and reinforcement for healthful eating and physical activity; involvement for parents and the community; and screening, counseling, and referral for nutrition problems as part of school health services. (Olson, 1995, p. 1)

The school food service program was an important way to ensure that children and adolescents in the United States would have access to healthful food that followed the recommendations of the Dietary Guidelines for Americans (DGA), as outlined in the Food Guide Pyramid. To enhance consistent support and reinforcement to meet the child or adolescent needs, it was emphasized that nutrition professionals, school food service professionals, school nurses, coaches, health
educators, parents, physicians, and members of the school and community who assist with the nutritional management of the child or adolescent should participate in the food and nutrition programs. In the position statement of the ADA about child and adolescent food and nutrition programs, it was stated:

It is the position of The American Dietetic Association that all children and adolescents should have access to adequate food and nutrition programs, regardless of economic status, special needs, and cultural diversity. Appropriate child/adolescent food and nutrition programs include food assistance and feeding programs and nutrition education, screening, assessment, and intervention. (McConelll & Shaw, 1996, p. 913)

The Joint Committee on Health Education Terminology (1990) reported that comprehensive school health programs should include school food service and cover the content of nutrition in school health instruction. To evaluate current attitudes, Robinson and Hamilton (1995) conducted a needs assessment for the Iowa Nutrition Education and Training (NET) program. A total of 177 health educators responded to the survey. The researchers reported only 7.1% of the sample responded "Agree" or "Strongly Agree" on working with the school food service managers to plan ways to use the cafeteria
as a laboratory for students to apply what they have learned about making healthful food choices. Of the participants, 12.3% responded "Agree" or "Strongly Agree" with school principals encouraging teachers to use the cafeteria as a learning laboratory for classes on food and nutrition. Approximately 14% of respondents reported that they would contact the district school food service director (supervisor) if they needed to consult with another educational professional about a question on nutrition. It would seem that health educators' orientations toward incorporating local sources of nutrition education are limited.

Robinson and Hamilton (1995) reported that 52% (n=102) of the school food service district directors lacked time to work with teachers on nutrition education activities for classes. Results also were identified in the White Paper of the Citizen's Commission on School Nutrition (1990) and in a report by DeMicco (1990). Moreover, DeMicco (1990) reported barriers that impeded school food service directors from implementing the DGA included lack of classroom education and parental support for reinforcing practices of the school food service program.

Hurd, Friedman, and Cise (1996) surveyed school food service directors in 1,063 school districts in Texas to evaluate the implementation of the DGA into the Child
Nutrition Programs (CNP). They found that school food service directors in large school districts followed the DGA more than those in smaller districts. They assumed that large school district food service directors had better access to food products and greater economic and educational resources. They encouraged all school food service directors to work to overcome these challenges.

Neill (1979) identified school food service personnel as the key to increased acceptance of school nutrition programs. A district director of school food service assumes responsibility for planning, organizing, directing, and administering the district's program. One of the duties legislated in 1994 by the Iowa Department of Education, was to "Provide educational resources and technical assistance to schools relating to the implementation of the nutritional guidelines for food and beverages sold on public school grounds or on the grounds of non-public schools receiving funds under section 283A.10" (Department of Education, 1995, p. 1968). Thus, it is important to examine the extent to which Iowa school food service directors use nutrition education activities and to determine their attitudes toward nutrition education.

As a part of the larger research study, a qualitative approach using in-depth interviews was employed to obtain
information related to incorporating nutrition education into school lunch programs. It is understood that in a qualitative approach, the researcher and participants interact and influence each other. This interaction is used to expand the inquiry, and the inquirer is seen as an instrument gaining in knowledge and insight. Qualitative research helps us understand attitudes, behaviors, and contexts from many points of view (Patton, 1990). Using qualitative methods, articulated values are used to formulate theory, problem statements, methods, and analysis of data (Stainback & Stainback, 1984). In-depth interviews provide an unique way to examine nutrition education activities incorporated into school lunch programs and to understand school food service directors' attitudes toward nutrition education. This method provides rich contextual data to reveal the depth and dynamics of intervention by school food service and nutrition education professionals in a multitude of contexts.

Specifically, the objectives of this study were to:

1. examine the extent to which Iowa private school food service directors incorporate nutrition education activities into school lunch programs.

2. determine attitudes of Iowa private school food service directors toward nutrition education.
3. validate items to be used in developing a self-administered questionnaire to enhance the validity of the survey when used with directors in the Iowa public school food service programs.

METHODOLOGY

For the purpose of this study, in-depth interviews were used as the vehicle for collecting both qualitative and quantitative data. In a qualitative approach, truth is believed to be primarily a matter of perspective, an in-depth understanding of issues or phenomena within particular contexts (Patton, 1990). Qualitative research is valid when the data represent a true picture of what is being investigated (Stainback & Stainback, 1984). Credibility, dependability, and transferability are suggested guidelines to ensure quality in qualitative research (Guba, 1981). These considerations are incorporated into the following sections.

Selection of sample

Interviewees were selected using purposive sampling. Purposive sampling is used to identify interviewees who represent targeted diversity. All 12 interviewees were food service directors who were responsible for the management and
administration of food service programs in Iowa private schools. The size of schools was divided by enrollment into three groups: small schools < 300 (n=4), medium schools ≥ 301 and < 500 (n=4), and large schools ≥ 501 (n=4). Information about selected interviewees and schools was provided by the NET coordinator from the Iowa Department of Education.

Interview development

An interview schedule (Attachment A) was developed for this study. A review of literature was undertaken to choose relevant content for writing items contained in the original survey that was developed for the study of district directors in the Iowa public school food service programs. Questions were written to establish construct-related evidence of validity. Content-related evidence of validity for the original survey was established by a panel of experts in school food service research at Iowa State University (ISU) and the NET Coordinator from the Iowa Department of Education. Few changes were made in the interview schedule based upon recommendations of the experts. The interview schedule consisted of four parts: demographic information, 24 attitude items about the importance of nutrition education, 11 items concerning the nature and extent of nutrition education activities, and open-ended questions concerning aspects for
implementing nutrition education. A five-point, Likert-type scale format was used for the attitude items with 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, and 5=Strongly Agree.

Data collection

Individual interviews were conducted with 12 school food service directors in 8 Iowa counties. For purposes of confidentiality, each interviewee was assigned a number. Interviews were conducted in either the interviewee's office, a school food service kitchen, or a school cafeteria. The atmosphere was familiar, and the place was comfortable for interviewees to express their attitudes, feelings, and opinions about topics under discussion. The length of time for each interview varied from 30-to-45 minutes. The researcher recorded information during the interviews using the interview schedule as a guide to ensure consistency across the individual interviews. After all interviews were completed, data were collected and analyzed.

Data analysis

Data collected from each individual interview were analyzed by assigning code words to specific lines of text. The following steps were used to analyze the qualitative data:
debriefing period, analyzing records, developing and merging themes, and determining reliability. Quantitative data were analyzed using Release 6.0 of the Statistical Package for the Social Sciences (SPSS). Demographic information and attitudinal data were analyzed by descriptive statistics. A reliability test was performed on each factor using Cronbach's alpha.

RESULTS AND DISCUSSIONS

In this study, qualitative data were analyzed in nonstatistical ways, while quantitative data were analyzed using descriptive statistics. Results of the study are presented in four parts: demographic characteristics of interviewees, interviewees' responses to interview questions, analysis of materials for nutrition education, and analysis of attitude responses.

Demographic characteristics of interviewees

All 12 interviewees were female and in charge of school food service programs in private schools. The 12 private schools studied included high school (n=5); followed by kindergarten through 8th grade (n=4); and preschool through 8th grade, kindergarten through 6th grade, and preschool
through 12th grade (n=1 for each). Most interviewees' job titles were food service manager (n=4); followed by food service supervisor (n=3); and cafe manager, cook manager, kitchen manager, food service director, and principal (n=1 for each).

Interviewees were quite similar in their levels of education. The majority of interviewees (n=10) have attended ISU School Food Service Short Courses I, II, and III. The length of their work experiences in school food service ranged from 2 to 35 years, and they had been at their current position from 1 year to 20 years. Most interviewees reported lunch was served in the cafeteria (n=5), followed by a multifunctional room (in use for such things as lunch and study) (n=3), a gym (n=3), and a classroom (n=1) (Table 1).

Interviewees' responses to interview questions

1. Do you use nutrition education materials?
   All interviewees responded "Yes".

2. What materials do you use? Where do you get them?
   "We use textbooks from area education agency, Heartland, Johnston, Iowa. Get posters from hot lunch programs, Dairy Council, and some materials from Dairy Council and the state." (R#1, 4/8/97).

   "Nutrition labeled products, other materials such as posters (e.g. Got Milk); recipes; and newsletters from Dairy Council, Food Nutrition, Team Nutrition, and Bureau of Education. Sometimes, we get materials from
Table 1. Demographic characteristics of interviewees

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</tbody>
</table>

"Dietary Guidelines, basic requirements from the state, Bureau of Food and Nutrition, Department of Education. A few from vendors." (R#3, 4/17/97).

"Got Milk Poster. Shape Your Future—milk, grains, fruits, vegetables poster. A Tool Kit for Healthy
School Meals, recipes and training materials from Team Nutrition, USDA.” (R#4, 4/17/97).

“Labels, State recommended Food Guide Pyramid, Team Nutrition from USDA. I put posters in the gym but they don’t work. Now, I put them on a bulletin board near the entrance.” (R#5, 4/18/97).

“Food Guide Pyramid, Dietary Guidelines, State Monthly Newsletters, and posters. Next Thursday or Friday, the State will analyze nutrition values for a week’s menus. I get newsletters from USDA. Get information like tips, products. Sometimes, get booklets with nutrition information from vendors. If I can get many posters, it’s better. Sometimes, I buy posters from Fort Dodge Party Production. (R#6, 4/18/97).

“New Program for Kids, some recipes from the state and USDA, monthly newsletters from the state.” (R#7, 4/18/97).

“Government sent recipes, Food Guide Pyramid, Food Production Menu, a few posters from vendors (F&H or Farmer).” (R#8, 4/21/97).

“I get brochures once to twice a year from the Dairy Association, books and Dietary Guidelines from the state. I also use CD-ROM. The science class teaches nutrition at 1-5 grades.” (R#9, 4/22/97).

“Materials from Iowa State Short Courses, Team and Healthy School meals from the state, Milk posters from Dairy Council about twice a year. I put the Food Guide Pyramid on the bulletin board.” (R#10, 4/23/97).

“I get standardized recipes and follow guidelines from the state. Some from vendors (H&H, Dairy Council, meat vendors) about 2-3 times a year. I get newsletters from the state once a month.” (R#11, 4/24/97).

“I get Dietary Guidelines, State standardized recipes for monthly menu planning, State monthly newsletters. Sometimes, I get materials from vendors (Martin Bros). I don’t have posters.” (R#12, 4/24/97).
Interviewees reported that most nutrition education materials (85%) were acquired from the Bureau of Food and Nutrition, Iowa Department of Education and the USDA, some (15%) were from commodity groups and vendors. Most interviewees (n=10) indicated that nutrition education materials were used mostly for planning menus. They seldom shared the information with students and teachers. During the interview, some interviewees (n=5) reported that nutrition education was taught by health teachers or classroom teachers; it is not a part of their work. Half of the interviewees stated that preparing nutritious meals for students was the only and most important part of their jobs. None of the interviewees used a computerized nutrition analysis program for menu planning. All of them planned menus based on the state requirement. The majority of interviewees (n=9) found posters were effective to deliver nutrition education but had little access to them. Furthermore, interviewees who had lunch served in a gym or room used for multi-purposes reported no storage or display areas for posters or other nutrition education materials.

The researcher visited dining areas and found very limited in materials related to nutrition education, even in cafeterias. Interviewees kept most materials in their offices for menu planning.
3. How often do you receive them?

"About 4 times a year." (R#1, 4/8/97).

"About every month." (R#2, 4/16/97; R#5, 4/18/97; R#6, 4/18/97; R#8, 4/21/97; R#11, 4/24/97; R#12, 4/24/97).

"About twice a year." (R#3, 4/17/97; R#9, 4/22/97; R#10, 4/23/97).

"Once in a while I receive them. About twice a year from the state." (R#4, 4/17/97).

"2-3 times a year when I do a major commodity order." (R#7, 4/18/97).

Half of the interviewees reported that they received nutrition education materials monthly, while five others responded "about two to three times a year" and one reported "four times a year".

4. How often do you use them?

"I use them very often, almost every day for planning menu." (R#1, 4/8/97; R#3, 4/17/97; R#4, 4/17/97; R#6, 4/18/97).

"Once a month I use them for menu planning." (R#2, 4/16/97; R#7, 4/18/97; R#8, 4/21/97; R#9, 4/22/97; R#10, 4/23/97; R#12, 4/24/97).

"I use them to plan menus about twice a week." (R#5, 4/18/97).

"Every week." (R#11, 4/24/97).

Interviewees reported that they used nutrition education materials about once a month (n=6), followed by daily (n=4),
twice a week (n=1), and weekly (n=1). Interviewees indicated that the main usage was for menu planning.

5. Do you have problems in getting and using nutrition education materials? Could you explain?

"I have problems incorporating nutrition education materials into the classroom because health education co-teachers teach the curriculum "Food and Nutrition" in the senior year." (R#4, 4/17/97).

"Parents make changes in menu planning. They want all the children in the school district to have the same menu." (R#5, 4/18/97).

"I don't get posters! I am quite new at my current position. When I first started I didn't know how to get information... I think new food service managers should have access to information." (R#12, 4/25/97).

None of the interviewees reported having a problem getting nutrition education materials. However, they had little involvement in teaching or delivering nutrition information in a classroom setting. Factors may include time constraints and curriculum planning. The nutrition education materials they had were seldom or never shared with teachers. Many interviewees (n=9) showed interest in working with students and teachers to deliver nutrition education if given opportunities.
6. What other suggestions do you have for delivering nutrition education in your school food service program?

"I can do more to involve people in the kitchen." (R#1, 4/8/97).

"Have chefs from hotels prepare food, with unfamiliar, but good food." (R#2, 4/16, 97).

"Tie with food and work with their projects. Work with teachers more. Fit into their curriculum, such as planning menus with them." (R#3, 4/17/97).

"More opportunities to work with the Health Education Department. Better time frame. Lack of time. Nutrition education is important. We better start at an earlier age than high school kids to encourage them to try different items, and to offer them a variety foods." (R#4, 4/17/97).

"Use standardized recipes in menu planning." (R#5, 4/18/97).

"It would be better if we have kids together and we present guidelines of what we do. Get involved in the classroom to share nutrition information." (R#6, 4/18/97).

"I need more time. Not enough time to do food service preparation." (R#7, 4/18/97).

"Not my responsibility to let kids learn nutrition. It's the job for health teachers. I just provide nutritious meals daily. Kids don't ask; they tell the food service staff their opinions of food service." (R#8, 4/21/97).

"Make them understand the importance of nutrition values." (R#9, 4/22/97).

"Send government materials to health teachers." (R#10, 4/23/97).

"Vending machines closed during lunch and closed campus." (R#11, 4/24/97).
"Put articles related to nutrition information in school newsletters and use bulletin boards to post information." (R#12, 4/25, 97).

Again, these statements showed that the interviewees generally recognized the importance of delivering nutrition education. They were willing to initiate a collaboration with students, parents, communities, and teachers to enhance nutrition education.

7. How often do you discuss menus with school food service personnel, teachers, nurses, principals, superintendent, other school administrators, school board, students, and parents?

Responses were recorded with 1=Daily; 2=Weekly; 3=Twice a month; 4=Monthly; 5=Annually; and 6=Never. Most interviewees (n=5) discussed menus with food service personnel on a monthly basis, followed by daily (n=4), twice a week (n=1), twice a month (n=1), and never (n=1). Interviewees (n=5) also reported they discussed menus with students on a monthly basis and most discussions were informal. Most interviewees reported that they "never" or "once a year" discussed menus with teachers, nurses, principals, superintendent, other school administrators, school board, and parents (Table 2).
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1=Daily; 2=Weekly; 3=Twice a month; 4=Monthly; 5=Annually; and 6=Never.
8. How often do you discuss nutrition education materials with school food service personnel, teachers, nurses, principals, superintendent, other school administrators, school board, students, and parents?

Responses were recorded with 1=Daily; 2=Weekly; 3=Twice a month; 4=Monthly; 5=Annually; and 6=Never. Half of the interviewees (n=6) discussed nutrition education materials with food service personnel on a monthly basis, followed by daily (n=2), twice a week (n=1), twice a month (n=1), annually (n=1), and never (n=1). The majority of the interviewees reported that they "never" or "once a year" discussed nutrition education materials with teachers, nurses, principals, superintendent, other school administrators, school board, students, and parents (Table 3).
Table 3. Discuss nutrition education materials

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3=Daily; 2=Weekly; 3=Twice a month; 4=Monthly; 5=Annually; and 6=Never.

9. How often do you plan nutrition education activities with school food service personnel, teachers, nurses, principals, superintendent, other school administrators, school board, students, and parents?

Responses were recorded with 1=Daily; 2=Weekly; 3=Twice a month; 4=Monthly; 5=Annually; and 6=Never. The majority of the interviewees reported that they “never” or “once a year” planned nutrition education activities with teachers, nurses,
principals, superintendent, other school administrators, school board, students, and parents (Table 4).

Table 4. Plan nutrition education activities

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<th>R7</th>
<th>R8</th>
<th>R9</th>
<th>R10</th>
<th>R11</th>
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</tr>
</tbody>
</table>

^1=Daily; 2=Weekly; 3=Twice a month; 4=Monthly; 5=Annually; and 6=Never.

10. How often do you organize nutrition education workshops or training programs for school food service personnel, teachers, nurses, principals, superintendent, other school administrators, school board, students, and parents?
Responses were recorded with 1=Daily; 2=Weekly; 3=Twice a month; 4=Monthly; 5=Annually; and 6=Never. The majority of the interviewees reported that they "never" or "once a year" organized nutrition education workshops or training programs for teachers, nurses, principals, superintendent, other school administrators, school board, students, and parents (Table 5).

Table 5. Organize nutrition education workshops or training programs

<table>
<thead>
<tr>
<th>Variables</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
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<th>R7</th>
<th>R8</th>
<th>R9</th>
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<td>Other school administrators</td>
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<td>6</td>
</tr>
</tbody>
</table>

*1=Daily; 2=Weekly; 3=Twice a month; 4=Monthly; 5=Annually; and 6=Never.
11. How often do you do the following activities?

- Teach nutrition education in the classroom.
- Plan nutrition education curriculum.
- Develop nutrition education materials for classroom use.
- Involve students in the preparation of nutritious meals in the school cafeteria.
- Use marketing activities to promote healthy eating habits.

Responses were recorded with 1=Daily; 2=Weekly; 3=Twice a month; 4=Monthly; 5=Annually; and 6=Never. The majority of interviewees responded they never taught nutrition education in the classroom (n=10), planned nutrition education curriculum (n=11), developed nutrition education materials for classroom use (n=9), and involved students in the preparation of nutritious meals in the school cafeteria (n=8). Interviewees reported students participated in preparing nutritious menus four times a year (n=2) and annually (n=2). Three interviewees reported they used marketing activities to promote healthy eating habits monthly, while three reported four times a year, and one reported twice a year (Table 6).
Table 6. Nutrition education activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>R6</th>
<th>R7</th>
<th>R8</th>
<th>R9</th>
<th>R10</th>
<th>R11</th>
<th>R12</th>
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<tbody>
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<td>6</td>
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<tr>
<td>Plan nutrition education curriculum</td>
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<td>5</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
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<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Develop nutrition education materials</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>5</td>
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<td>6</td>
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<tr>
<td>Involve students in preparing meals</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Use marketing activities to promote healthy eating habits</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>6</td>
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<td>2</td>
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<td>2</td>
</tr>
</tbody>
</table>

*1=Daily; 2=Weekly; 3=Twice a month; 4=Monthly; 5=Annually; and 6=Never.

12. What other activities do you plan for delivering nutrition education? How often?

"Hold a health fair, working with nurses and dietetic students, one day per year." (R#1, 4/8/97).

"Invite parents to participate in school lunch programs and provide samples of healthy foods for students to taste once a semester." (R#2, 4/16/97).

"Organize a mother’s club, working with parents to promote healthy eating habits. About twice a year." (R#3, 4/17/97).

"Order materials from Iowa State School Food Service Association twice a year, get software for nutrition analysis for the next year, 1998, and plan menus to increase fruit and vegetable servings." (R#4, 4/17/97).

"Plan a full salad bar menu." (R#5, 4/18/97).
"I don’t have time to do nutrition education. I will work with the home economic teacher and principal to get involved." (R#6, 4/18/97).

"Work with home economic teacher to develop a film for nutrition education. Provide a full salad bar to increase vegetable and fruit servings." (R#7, 4/18/97).

"I teach nutrition education in the science class twice a year." (R#8, 4/22/97).

"Help kids from each grade plan nutritious menus for a week, once a year." (R#9, 4/22/97).

"Work with each classroom to plan a meal for a day, once a year." (R#10, 4/23/97).

"Develop parents’ monthly memo and school newsletters to deliver nutrition information once a year." (R#11, 4/24/97).

"Plan to deliver nutrition information and promote school food service programs on television through the student channel, “Newman Nights- Night Cam.” (R#12, 4/24/97).

13. What suggestions do you have for improving these interview questions? What additional questions are relevant to school nutrition education activities?

"Parents? In what way they should be involved? How to get them involved?" (R#1, 4/8/97).

"How students are interested in receiving nutrition education?" (R#2, 4/16/97).

"Communication between schools to share information." (R#7, 4/18/97).
Responses from interview questions 12 and 13 revealed interviewees' concerns about getting parents, community, and students involved in school food service program: to share, support, and reinforce nutrition education information, to enhance learning and practicing of healthy eating choices. All interviewees responded that interview questions were well constructed and clearly stated. They were very friendly and kind in providing the needed information for the study.

Analysis of materials for nutrition education

A checklist consisting of 11 items was used to obtain the information about nutrition education materials interviewees used in school. A score of zero was recorded if the item was not used, while one was recorded if the item was used. The majority of the interviewees reported that they used newsletters (n=12), brochures/booklets/pamphlets (n=10), posters (n=10), videotapes (n=9), and flyers (n=7) to deliver nutrition education. Some reported they used audiotapes (n=6), CD-Rom (n=5), computers (n=4), and television (n=3). None of the interviewees used table tents. Scores for each item were computed for all interviewees as shown in Table 7.
Table 7. Checklist of nutrition education materials used in school

<table>
<thead>
<tr>
<th>Materials</th>
<th>R1</th>
<th>R2</th>
<th>R3</th>
<th>R4</th>
<th>R5</th>
<th>R6</th>
<th>R7</th>
<th>R8</th>
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</tbody>
</table>

^aTotal number of interviewees using this material for nutrition education.

Analysis of attitude responses

All interviewees completed 24 attitude items. Attitudinal response scales ranged from 1 to 5 and included the following descriptors: 1=Strongly Disagree; 2=Disagree; 3=Neutral, 4=Agree; and 5=Strongly Agree. Mean scores and standard deviations were computed for all attitude items.
(Table 8). The mean score was 3.88 and standard deviation was 0.67. The coefficient of reliability was $r = 0.76$.

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
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</thead>
<tbody>
<tr>
<td>1. It is not important to provide students with nutrition information.</td>
<td>4.25</td>
<td>1.22</td>
</tr>
<tr>
<td>2. Educating students about healthy food choices is not important.</td>
<td>4.67</td>
<td>.49</td>
</tr>
<tr>
<td>3. The school lunch program should be used as a learning environment for nutrition education.</td>
<td>4.25</td>
<td>.62</td>
</tr>
<tr>
<td>4. The school food service program is a significant part of a nutrition education program.</td>
<td>4.50</td>
<td>.52</td>
</tr>
<tr>
<td>5. An important part of my responsibilities is to provide nutrition information to students.</td>
<td>3.67</td>
<td>.78</td>
</tr>
<tr>
<td>6. Students should learn healthy food choices from parents.</td>
<td>4.42</td>
<td>.51</td>
</tr>
<tr>
<td>7. Students should learn healthy food choices from teachers.</td>
<td>3.67</td>
<td>.89</td>
</tr>
<tr>
<td>8. Students should learn healthy food choices from school food service personnel.</td>
<td>4.00</td>
<td>.85</td>
</tr>
<tr>
<td>9. Involvement in planning the nutrition education curriculum is not important.</td>
<td>4.08</td>
<td>.79</td>
</tr>
<tr>
<td>10. Students are not interested in nutrition information.</td>
<td>3.00</td>
<td>.95</td>
</tr>
<tr>
<td>11. The school administration doesn’t support nutrition education activities in the school food service program.</td>
<td>3.25</td>
<td>1.14</td>
</tr>
<tr>
<td>Item</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>------</td>
<td>-----</td>
</tr>
<tr>
<td>12. Working with school teachers to deliver nutrition education is not important.</td>
<td>3.29</td>
<td>.29</td>
</tr>
<tr>
<td>13. Parents should not be involved in school nutrition education.</td>
<td>3.82</td>
<td>.72</td>
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<tr>
<td>14. Participating in planning school nutrition education activities is enjoyable.</td>
<td>3.50</td>
<td>.80</td>
</tr>
<tr>
<td>15. Special funding is required to provide nutrition education activities.</td>
<td>3.17</td>
<td>.94</td>
</tr>
<tr>
<td>16. I don't feel competent to teach nutrition education.</td>
<td>3.33</td>
<td>.49</td>
</tr>
<tr>
<td>17. I am knowledgeable about healthy food choices.</td>
<td>4.33</td>
<td>.49</td>
</tr>
<tr>
<td>18. There isn't time to discuss nutrition information with students.</td>
<td>2.67</td>
<td>.89</td>
</tr>
<tr>
<td>19. Qualified school food service staff is required to implement nutrition education.</td>
<td>3.92</td>
<td>.67</td>
</tr>
<tr>
<td>20. Introducing the Food Guide Pyramid to students is not important.</td>
<td>4.25</td>
<td>.45</td>
</tr>
<tr>
<td>21. The Food Guide Pyramid should be taught in the classroom.</td>
<td>4.25</td>
<td>.45</td>
</tr>
<tr>
<td>22. Nutrition education effectively reinforces the use of the Food Guide Pyramid.</td>
<td>4.17</td>
<td>.11</td>
</tr>
<tr>
<td>23. Using the Food Guide Pyramid to teach students about nutrition is important.</td>
<td>4.25</td>
<td>.45</td>
</tr>
<tr>
<td>24. I lack knowledge about the Food Guide Pyramid.</td>
<td>3.92</td>
<td>1.00</td>
</tr>
<tr>
<td>Mean of Items</td>
<td>3.88</td>
<td>.67</td>
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</tbody>
</table>
After analyzing attitude responses, results showed that interviewees generally had positive attitudes toward nutrition education. However, interviewees stated that there was no time to discuss nutrition education with students (mean=2.67) and felt students were not interested in nutrition information (mean=3.00). These are challenges for school food service professional to overcome.

SUMMARY AND IMPLICATIONS

Summary

The objectives of the qualitative study were to: (a) examine the extent to which Iowa private school food service directors incorporate nutrition education activities into school lunch programs, (b) determine attitudes of Iowa private school food service directors toward nutrition education, and (c) validate items to use in developing a self-administered questionnaire to enhance the validity of the survey when used with directors in the Iowa public school food service programs.

Results of this study will be useful in understanding how school food service directors deliver nutrition education in school lunch programs. They also will provide qualitative information for the researcher to modify the quantitative
instrument for the future study involving Iowa public school food service district directors. To attain these objectives, in-depth interviews were used to collect both qualitative and quantitative data.

Literature related to school food service programs, school food service directors' roles and duties, and nutrition education in school lunch programs was reviewed. The review served as a basis for writing items contained in the original survey questionnaire that was developed for the study of district directors in the Iowa public school food service programs. To collect qualitative information, the researcher developed an interview schedule. All interviewees responded to questions in the interview about demographic information, attitude items about the importance of nutrition education, items concerning the nature and extent of nutrition education activities, and open-ended questions concerning aspects for implementing nutrition education.

Quantitative data were analyzed using Release 6.0 of the SPSS. Demographic information and attitudinal data were analyzed by descriptive statistics including means and standard deviations. The reliability for the attitude inventory used in this study was $r=0.76$. Qualitative data were analyzed using the following procedures: debriefing
period, analyzing records, developing and merging themes, and determining reliability.

A total of 12 private school food service directors in Iowa were interviewed. Interviewees were all female and in charge of school food service programs. Their attitudes toward nutrition education were generally positive (mean=3.88, SD=0.67). Interviewees recognized the importance of providing nutritious meals and incorporating nutrition education into school lunch programs, and they were willing to work with students, teachers, and parents to enhance nutrition education. However, some interviewees (n=4) reported that lack of time and student involvement might impede them in delivering nutrition education. Some (n=5) indicated that delivering nutrition education was not as important as providing nutritious meals to their students. A few (n=3) did not consider or recognize that delivering nutrition education was one of their responsibilities.

All interviewees reported that they used nutrition education materials and encountered no problems in obtaining materials. Most nutrition education materials (85%) were acquired from the Bureau of Food and Nutrition, Iowa Department of Education and the USDA; some (15%) were from commodity groups and vendors. Newsletters, brochures/booklets/pamphlets, posters, videotapes, and flyers were most
often received and used to deliver nutrition education. Half of the interviewees received and used nutrition education materials on a monthly basis. Interviewees indicated nutrition education materials were used mostly for planning menus and were used infrequently for delivering nutrition education. There was a lack of storage space and/or display area when a multipurpose room was used for the dining area.

The majority of interviewees (n=10) reported that they discussed menus and nutrition education materials with food service personnel more than once a month or on a monthly bases. They infrequently discussed nutrition education materials; planned nutrition education activities; or organized nutrition education workshops for students, teachers, nurses, principals, superintendent, other school administrators, school board, parents. They indicated little involvement in teaching or delivering nutrition education in a classroom setting. However, many interviewees (n=9) showed strong interest in working with teachers, students, and parents to deliver nutrition education if given opportunities. In summary, these interviews generated meaningful data related to the extent nutrition education was incorporated into school food service programs.
Implications

The results of these in-depth interviews indicated that school food service directors acknowledged the importance of providing nutritious meals and delivering nutrition education to students. Nutrition education materials were popular as a guide in preparing nutritious meals but seldom used to deliver nutrition education in the school lunch programs and classroom settings. Following are the implications from this study:

1. The in-depth interviews with food service directors provided the researcher with first-hand opportunities to observe the incorporation of nutrition education into school food service programs.

2. The researcher used the findings from this qualitative study to develop a self-administered instrument for use with district directors in the Iowa public school food service programs.
ATTACHMENT A: INTERVIEW SCHEDULE
Interview Questions:

Part 1:

1. What is your job title?

2. Could you tell me about your educational background?

3. Do you have any certification?

4. How long have you been working in school food service?

5. How long have you been in this position?

6. Where do you serve lunch?

7. Do you use nutrition education materials?
   Yes What materials do you use?
   Where do you get them?
   How often do you receive them?
   How often do you use them?

   No Do you have problems in getting and using nutrition education materials? Could you explain?
Part 2. Could you tell me how often you do the following?

7. Discuss menus with...

8. Discuss nutrition education materials with...

9. Plan nutrition education activities with...

10. Organize nutrition education workshops or training programs for...

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<td>School food service personnel</td>
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<td>Parents</td>
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11. How often do you do the following activities?

- Teach nutrition education in the classroom
- Plan nutrition education curriculum
- Develop nutrition education materials for classroom use
- Involve students in the preparation of nutritious meals in the school cafeteria.
- Use marketing activities to promote healthy eating habits.

12. What other activities do you plan to deliver nutrition education? and how often?
Part 3: Please describe your feelings for each statement by using the 1-5 scale from strongly disagree 1 to strongly agree 5.

1 2 3 4 5 1. It is not important to provide students with nutrition information.

1 2 3 4 5 2. Educating students about healthy eating choices is important.

1 2 3 4 5 3. The school lunch program should be used as a learning environment for nutrition education.

1 2 3 4 5 4. The school food service program is a significant part of a nutrition education program.

1 2 3 4 5 5. Providing nutrition information to students is an important part of my responsibilities.

1 2 3 4 5 6. Students should learn healthy eating choices from parents.

1 2 3 4 5 7. Students should learn healthy eating choices from teachers.

1 2 3 4 5 8. Students should learn healthy eating choices from the school food service personnel.

1 2 3 4 5 9. Being involved in planning the nutrition education curriculum is not important.

1 2 3 4 5 10. Students are not interested in nutrition information.

1 2 3 4 5 11. The school administration doesn’t support nutrition education activities in the school food service program.

1 2 3 4 5 12. Working with school teachers to deliver nutrition education is not important.
13. Parents should not be involved in school nutrition education.

14. Participating in planning school nutrition education activities is enjoyable.

15. Providing nutrition education activities requires special funding.

16. I don’t feel competent to teach nutrition education.

17. I am knowledgeable about healthy eating habits.

18. There isn’t time to discuss nutrition information with students.

19. Implementing nutrition education requires qualified school food service staff.

20. Introducing the Food Guide Pyramid to students is not important.

21. The Food Guide Pyramid should be taught in the classroom.

22. Nutrition education can effectively reinforce the use of the Food Guide Pyramid.

23. Teaching students about nutrition using the Food Guide Pyramid is important.

Check List

School: Date: Enrollment:

----------------------------------------

Materials for nutrition education

+ - Activity cards
+ - Audiotapes
+ - Brochures/Booklets/Pamphlets
+ - CD-ROM
+ - Computers
+ - Flyers (single sheet)
+ - Newsletters
+ - Posters
+ - Table tents
+ - Television
+ - Videotapes

Others: ________________________________________
Interview Questions at the end:

1. What other suggestions do you have for delivering nutrition education in your food service program?

2. What suggestions do you have for improving these interview questions? What additional questions are relevant to school nutrition education activities?
APPENDIX C. NUTRITION EDUCATION SURVEY
March 4, 1998

Dear School Food Service Director:

What is the role of school food service directors in nutrition education? The purpose of this research is to determine the extent to which Iowa School Food Service Directors are incorporating nutrition education into school food service programs. This study is being conducted by the Departments of Hotel, Restaurant, and Institution Management and Family and Consumer Sciences Education and Studies at Iowa State University. We acknowledge the assistance of Christine Anders, the NET coordinator, Iowa Department of Education. The enclosed questionnaire is part of the Ph.D. research for Tammy Chen. The results of this study will be important for enhancing nutrition education in Iowa school food service programs.

The information will be kept strictly confidential. In addition, information from the study will be reported only as group results. The number on the questionnaire will be used only for follow-up with individuals who do not return the questionnaire.

This questionnaire will take about 15 minutes to complete. When the questionnaire is completed, please fold, tape, and return it to us by March 30, 1997.

If you have any questions, please feel free to call 515/233-6525. We appreciate your participation and cooperation. Thank you very much for your time.

Sincerely,

Tammy Chen, M.S.  Rosalie J. Amos, Ph.D.  Shirley A. Gilmore, Ph.D., R.D.
Graduate Student  Associate Professor  Associate Professor
Part 1. Directions: Please complete the following

1. Your job title: ____________________________

2. District enrollment: ___ under 450 ___ 450-1500 ___ over 1500

3. Gender: ___ Female ___ Male

4. Your age: ___ under 30 years ___ 30-39 years ___ 40-49 years ___ 50-59 years ___ 60 or older

5. Highest degree earned:
   ___ Less than high school ___ High school/GED
   ___ Associate degree ___ Bachelor’s degree
   ___ Master’s degree ___ Ph.D. degree

6. Academic Major: (Check all that apply)
   ___ Dietetics/Food Science and Human Nutrition
   ___ Family and Consumer Sciences (Home Economics) Education
   ___ Hotel, Restaurant, and Institution Management
   ___ None
   ___ Other. Please specify: ____________________________

7. Certification status: (Check all that apply)
   ___ American School Food Service Association
   ___ Iowa School Food Service Association
   ___ Registered Dietitian
   ___ Not certified

8. Years in school food service:
   ___ under 1 ___ 1-5 ___ 6-10 ___ 11-20 ___ over 20

9. Years in present position:
   ___ under 1 ___ 1-5 ___ 6-10 ___ 11-20 ___ over 20

10. Does your district school food service program have a mission statement that includes nutrition education?
    ___ Yes ___ No

11. What are your sources of nutrition education materials?
    ___ Commodity groups (e.g. Dairy Council)
    ___ Government (e.g. Iowa Department of Education)
    ___ Non-profit organizations (e.g. American Heart Association)
    ___ USDA
    ___ Vendors
    ___ Other. Please specify: ____________________________

12. How frequently do you receive nutrition education materials?
    ___ Weekly ___ Twice a month ___ Monthly
    ___ Twice a year ___ Annually
Part 2. Directions: Please circle the response that describes how often you or one of your staff completes the following tasks.

**KEY:**

<table>
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<tr>
<th>Daily</th>
<th>Weekly</th>
<th>Twice a Month</th>
<th>Monthly</th>
<th>Twice a Year</th>
<th>Annually</th>
<th>Never</th>
</tr>
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</table>

13. Discuss nutrition education materials with:

1. Nurses
2. Other school administrators
3. Parents
4. Principals
5. School Board
6. School Food Service personnel
7. Students
8. Superintendent
9. Teachers
10. Other

14. Plan nutrition education activities with:

1. Nurses
2. Other school administrators
3. Parents
4. Principals
5. School Board
6. School Food Service personnel
7. Students
8. Superintendent
9. Teachers
10. Other

15. Organize nutrition education workshops or training programs for:

1. Nurses
2. Other school administrators
3. Parents
4. Principals
5. School Board
6. School Food Service personnel
7. Students
8. Superintendent
9. Teachers
10. Other

16. Discuss menus in relation to the Food Guide Pyramid with:

1. Nurses
2. Other school administrators
3. Parents
4. Principals
5. School Board
6. School Food Service personnel
7. Students
8. Superintendent
9. Teachers
10. Other
17. Use the following in nutrition education:

1 2 3 4 5 6 7 Audiotapes
1 2 3 4 5 6 7 Brochures/Booklets/Pamphlets
1 2 3 4 5 6 7 CD-ROM
1 2 3 4 5 6 7 Computers
1 2 3 4 5 6 7 Flyers (single sheet)
1 2 3 4 5 6 7 Newsletters
1 2 3 4 5 6 7 Posters
1 2 3 4 5 6 7 Table tents
1 2 3 4 5 6 7 Television
1 2 3 4 5 6 7 Videotapes
1 2 3 4 5 6 7 Other ___________________________

18. Participate in the following activities:

1 2 3 4 5 6 7 Developing nutrition education materials for classroom use.
1 2 3 4 5 6 7 Involving students in the preparation of nutritious meals in the school cafeteria.
1 2 3 4 5 6 7 Teaching nutrition education in the classroom.
1 2 3 4 5 6 7 Using marketing activities to promote healthy eating habits.
1 2 3 4 5 6 7 Other ___________________________
1 2 3 4 5 6 7 Other ___________________________
1 2 3 4 5 6 7 Other ___________________________

Part 3. Directions: Please circle the response which best describes your feelings. Please respond to each statement. The scale of response ranges from Strongly Disagree (1) to Strongly Agree (5).

KEY: 1=STRONGLY DISAGREE 2=DISAGREE 3=NEUTRAL 4=AGREE 5=STRONGLY AGREE

1 2 3 4 5 1. It is not important to provide students with nutrition information.
1 2 3 4 5 2. Educating students about healthy food choices is not important.
1 2 3 4 5 3. The school lunch program should be used as a learning environment for nutrition education.
1 2 3 4 5 4. The school food service program is a significant part of a nutrition education program.
1 2 3 4 5 5. An important part of my responsibilities is to provide nutrition information to students.
1 2 3 4 5 6. Students should learn healthy food choices from parents.
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<td>7.</td>
<td>Students should learn healthy food choices from teachers.</td>
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<td>8.</td>
<td>Students should learn healthy food choices from school food service personnel.</td>
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<td>9.</td>
<td>Involvement in planning the nutrition education curriculum is not important.</td>
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<td>10.</td>
<td>Students are not interested in nutrition information.</td>
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<td>11.</td>
<td>The school administration doesn't support nutrition education activities in the school food service program.</td>
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<td>12.</td>
<td>Working with school teachers to deliver nutrition education is not important.</td>
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<td>13.</td>
<td>Parents should not be involved in school nutrition education.</td>
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<td>14.</td>
<td>Participating in planning school nutrition education activities is enjoyable.</td>
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<td>15.</td>
<td>Special funding is required to provide nutrition education activities.</td>
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<td>16.</td>
<td>I don't feel competent to teach nutrition education.</td>
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<td>17.</td>
<td>I am knowledgeable about healthy food choices.</td>
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<td>18.</td>
<td>There isn't time to discuss nutrition information with students.</td>
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<td>19.</td>
<td>Qualified school food service staff is required to implement nutrition education.</td>
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<td>20.</td>
<td>Introducing the Food Guide Pyramid to students is not important.</td>
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<td>21.</td>
<td>The Food Guide Pyramid should be taught in the classroom.</td>
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<td>23.</td>
<td>Using the Food Guide Pyramid to teach students about nutrition is important.</td>
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<td>24.</td>
<td>I lack knowledge about the Food Guide Pyramid.</td>
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Thank you very much for your cooperation!
Thank you!
Please fold, tape, and mail it today. 
No postage is necessary.

IOWA STATE UNIVERSITY
Department of Hotel, Restaurant, and Institution Management
11 MacKay Hall
Ames, Iowa 50011-1120
APPENDIX D. CODE BOOK
Part 1. Demographic Information

1. Job title
   1= Food Service Director
   2= Food Service Manager
   3= Cafe Manager
   4= Kitchen Manager
   5= Other
   99= Missing values

2. Enrollment
   1= <450
   2= 450-1500
   3= >1500
   99= Missing values

3. Gender
   1= Female
   2= Male
   99= Missing values

4. Age
   1= <30
   2= 30-39
   3= 40-49
   4= 50-59
   5= >60
   99= Missing values

5. Education level
   1= < high school
   2= High school/GED
   3= Associate degree
   4= BA
   5= MS
   6= Ph.D.
   99= Missing values

   Academic major 1= Yes, 0= No, 99= Missing values

6. MAJDIET
7. MAJFCEDS
8. MAJHRIM
9. MAJNONE
10. MAJOTHER
Certification status 1= Yes, 0= No, 99= Missing values
11. CERASFS
12. CERISFS
13. CERRD
14. CERNONE

15. YRSFS
   1= <1
   2= 1-5
   3= 6-10
   4= 11-20
   5= >20
   99= Missing values

16. YRPOSITION
   1= <1
   2= 1-5
   3= 6-10
   4= 11-20
   5= >20
   99= Missing values

17. Mission
   1= Yes
   0= No
   99= Missing values

NED SOURCES 1= Yes, 0= No, 99= Missing values
18. SOUCOM ‘Commodity groups’
19. SOUGOV ‘Government’
20. SOUNPRO ‘Non-profit org’
21. SOUUSDA ‘USDA’
22. SOUVEND ‘Vendors’

23. NEDFRQ ‘NED frequency’
   1= Weekly
   2= Twice a month
   3= Monthly
   4= Twice a year
   5= Annually
   99= Missing values
Part 2: Nutrition Education Activities

1= Daily
2= Weekly
3= Twice a month
4= Monthly
5= Twice a year
6= Annually
7= Never
99= Missing values

Discuss nutrition education materials with:
24. NEMADM 'DISC NED MAT ADM'
25. NEMBOA 'DISC NED MAT BOARD'
26. NEMPAR 'DISC NED MAT PARENT'
27. NEMPRI 'DISC NED MAT PRINCIPAL'
28. NEMSFS 'DISC NED MAT SFS'
29. NEMSTU 'DISC NED MAT STUDENT'
30. NEMSUP 'DISC NED MAT SUP'
31. NEMTEA 'DISC NED MAT TEACHER'

Plan nutrition education activities with:
32. ACTADM 'PLAN NED ACT ADM'
33. ACTBOA 'PLAN NED ACT BOARD'
34. ACTPAR 'PLAN NED ACT PARENT'
35. ACTPRI 'PLAN NED ACT PRINCIPAL'
36. ACTSFS 'PLAN NED ACT SFS'
37. ACTSTU 'PLAN NED ACT STUDENT'
38. ACTSUP 'PLAN NED ACT SUP'
39. ACTTEA 'PLAN NED ACT TEACHER'

Organize nutrition education workshops or training program for:
40. NEWADM 'ORG NED WORK ADM'
41. NEWBOA 'ORG NED WORK BOARD'
42. NEWPAR 'ORG NED WORK PARENT'
43. NEWPRI 'ORG NED WORK PRINCIPAL'
44. NEWSFS 'ORG NED WORK SFS'
45. NEWSTU 'ORG NED WORK STUDENT'
46. NEWSUP 'ORG NED WORK SUP'
47. NEWTEA 'ORG NED WORK TEACHER'

Discuss menus in relation to the Food Guide Pyramid with:
48. FGPADM 'DISC FGP ADM'
49. FGPOBOA 'DISC FGP BOARD'
50. FGPPAR 'DISC FGP PARENT'
51. FGPPPRI 'DISC FGP PRINCIPAL'
52. FGPSFS 'DISC FGP SFS'
53. FGPSSTU 'DISC FGP STUDENT'
54. FGPSUP 'DISC FGP SUP'
55. FGPTEA 'DISC FGP TEACHER'
Use the following in nutrition education:
56. USEAUDI ‘Audiotapes’
57. USEBRO ‘Brochures’
58. USECEDROM ‘CD-ROM’
59. USECOMP ‘Computers’
60. USEFLYER ‘Flyers’
61. USENEWS ‘Newsletters’
62. USEPOST ‘Posters’
63. USETBTNT ‘Tabletents’
64. USETV ‘TV’
65. USEVIDEO ‘Videotapes’

Participate in the following activities:
66. AIDENVEM ‘DEVELOP NED MAT’
67. A2STUCAF ‘STU PREPARE CAFE’
68. A3TEANED ‘TEACH NED CLASS’
69. A4MKTNED ‘USE MARKETING ACT’

Part 3. Attitude Inventory
   1= Strongly disagree
   2= Disagree
   3= Neutral
   4= Agree
   5= Strongly agree
   99= Missing values

70. ATT1N ‘Provide nutrition information’
71. ATT2N ‘Healthy food choice’
72. ATT3 ‘SFS learning environment for NED’
73. ATT4 ‘SFS significant part of NED’
74. ATT5 ‘My responsibility to provide NED’
75. ATT6 ‘Parents responsibility for NED’
76. ATT7 ‘Teachers responsibility for NED’
77. ATT8 ‘SFS responsibility for NED’
78. ATT9N ‘Involved in NED curriculum’
79. ATT10N ‘Student interested in NED’
80. ATT11N ‘School adm support NED in SFS’
81. ATT12N ‘Work with teachers in NED’
82. ATT13N ‘Parents involved in NED’
83. ATT14 ‘Participate in planning NED’
84. ATT15N ‘Special funding required in NED’
85. ATT16N ‘Competent in NED’
86. ATT17 ‘Knowledge in healthy food choice’
87. ATT18N ‘Time for NED with students’
88. ATT12 ‘Qualified SFS to implement NED’
89. ATT20N ‘FGP important to student’
90. ATT21 ‘FGP taught in classroom’
91. ATT22 ‘NED reinforces the use of FGP’
92. ATT23 ‘Use FGP to teach NED’
93. ATT24N ‘FGP knowledge’
APPENDIX E. FOLLOW-UP POSTCARD
APPENDIX F. FREQUENCY DISTRIBUTIONS OF BACKGROUND AND DISTRICT VARIABLES, NUTRITION EDUCATION ACTIVITY VARIABLES, AND NUTRITION EDUCATION ATTITUDE VARIABLES
1=SFS director, 2=SFS manager, 3=FS supervisor, 4=kitchen manager, 5=head cook, and 6=other.

Figure 1. Frequency distribution of job title

1=less than 30, 2=30-39, 3=40-49 4=50-59, and 5=over 60.

Figure 2. Frequency distribution of age
1=less than high school, 2=high school/GED, 3=associate degree, 4=bachelor's degree, and 5=master's degree.

Figure 3. Frequency distribution of education level

0=no and 1=yes (more than one response possible).

Figure 4. Frequency distribution of academic major
0=no and 1=yes (more than one response possible).

Figure 5. Frequency distribution of certification status

0=no and 1=yes (more than one response possible).

Figure 6. Frequency distribution of sources of nutrition education materials
1 = weekly, 2 = twice a month, 3 = monthly,
4 = twice a year, and 5 = annually.

Figure 7. Frequency distribution of receiving
nutrition education materials

1 = daily, 2 = weekly, 3 = twice a month, 4 = monthly,
5 = twice a year, 6 = annually, and 7 = never.

Figure 8. Frequency distribution of discussing
nutrition education materials
1=daily, 2=weekly, 3=twice a month, 4=monthly, 5=twice a year, 6=annually, and 7=never.

Figure 9. Frequency distribution of planning nutrition education activities

1=daily, 2=weekly, 3=twice a month, 4=monthly, 5=twice a year, 6=annually, and 7=never.

Figure 10. Frequency distribution of organizing nutrition education workshops or training programs
1 = daily, 2 = weekly, 3 = twice a month, 4 = monthly, 5 = twice a year, 6 = annually, and 7 = never.

Figure 11. Frequency distribution of discussing menus in relation to the Food Guide Pyramid

1 = daily, 2 = weekly, 3 = twice a month, 4 = monthly, 5 = twice a year, 6 = annually, and 7 = never.

Figure 12. Frequency distribution of use of nutrition education materials
1=daily, 2=weekly, 3=twice a month, 4=monthly, 5=twice a year, 6=annually, and 7=never.

Figure 13. Frequency distribution of the involvement in nutrition education activities

1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Figure 14. Frequency distribution of Concept 1
1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Figure 15. Frequency distribution of Concept 2

1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Figure 16. Frequency distribution of Concept 3
1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree.

Figure 17. Frequency distribution of Concept 4
APPENDIX G. SCHOOL FOOD SERVICE DISTRICT DIRECTORS' COMMENTS
School Food Service District Directors’ Comments

Att5:
"Obviously, we have been weak in the areas of nutrition education coming from our kitchen staff. Nutrition is covered by other teaching departments but has not been an educational tool of the kitchen staff." (R#157)

“But I don’t have time in a day!!!” (R#167)

“Could be and probably should be, but current staffing allows no time.” (R#191)

Att6:
“I feel parents are responsible for some of the early eating habits. Kids form when at home/ Before Beginning school.” (R#73)

Att11:
“Only wish I could do some of these things but when super has to be cook and do jobs as supervisor, doesn’t allow much time—also School Boards are going to have to realize that we the noncertified staff are important just as teachers!” (R#155)

Att13:
“They should do this part at home and we are at school.” (R#33)

“This causes quite a problem when parents are involved at lunch area, very picky!” (R#73)

Att14:
“We don’t have time to plan.” (R#8)

“There is a lack of time available to do this planning.” (R#139)

“When you have time...” (R#167)

Att16:
“I feel this should be done by the nurse and teachers. We don’t have time.” (R#73)

ATT18:
“Finding time is difficult for both teachers and F.S. Personnel.” (R#67)
Present time restriction.” (R#131)

General Comments:
“We are presently beginning the Team Nutrition program and will be doing much more with teaching staff and students. Our County Extension Office is organizing a county coalition on nutrition to include many people who work with nutrition to improve and organize nutrition education.” (R#67)

“In smaller school districts Food Director is also Head Cook. No time is left to implement education on nutrition after making our menus, inventory, ordering, production records and staff management besides cooking.” (R#75)

“Running a food service for schools is plenty work- there is no time for what you advocate. The students are taught nutrition education in the classroom.” (R#90)

“Our teachers do not want involvement from food service personnel in regards to nutrition education.” (R#122)

“One area your survey did not touch on was physical need; many smaller, older schools simply do not have facilities, equipment or storage areas that would allow them to utilize the materials available. Of five sites, we have none at this time that we can utilize except for the hour we serve lunch. While we realize the potential value of visual aids and planned nutrition activities, we are simply unable to do so without space. When our new school is completed next year, we do anticipate expanding our role in nutrition education and becoming more active in curriculum planning. I also do counseling for pregnant students on healthy choices, journaling food items and such. This is a relatively new area for those of us in food service.” (R#123)

“I am neutral on many of the items. I feel I agree with many of them but as a food service worker who is pressed for time and overburdened with duties and already works a full day, I can not take on responsibilities to teach classroom nutrition. I believe the teachers in the classroom should be required.” (R#185)

“I think some of this could be taught in Home Ec. class.” (R#230)

“There just isn’t enough time. I wish there was. It’s definitely a goal of mine but most time seems unreachable.” (R#235)
REFERENCES


School Meal Programs, Code of Iowa 1995 (II), Chapters 159-330B. §283A.2.2. 2237 (1995c).


