NUTRITION EDUCATION IN COLLEGE AND UNIVERSITY FOOD SERVICES

By

PEGGY ANN SMITH

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Thesis Approved:

Bernice Kopell
Thesis Advisor

Andrew B Augustine

Anna M. Gorman

Norman N. Durham
Dean of the Graduate College

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CHAPTER I

INTRODUCTION

With the evidence that many health problems are related to dietary habits, nutrition education is quickly becoming an increasingly important issue. Several government agencies have conducted studies to assess the adequacy of the American diet, and to make recommendations to the public on how to improve their diet. To help improve the eating habits of Americans, programs supported by the federal government range from school lunch, food stamps, food supplements, and the Nutrition Education and Training program in elementary and secondary schools.

In 1975, the findings from the National Health and Nutrition Examination Studies (NHANES) indicated that the American diet was inadequate in several nutrients, including vitamin A, iron, and calcium. Initial reports from the NHANES II follow-up study indicated that selected segments of the population still failed to consume adequate amounts of some nutrients. Reports on the dietary intakes of college students showed that age and level of education do not necessarily indicate better nutritional status (Driskell, Keith, & Tangney, 1979; Jakobovits, Halstead, Kelley, Roe, & Young, 1977).

Nutritional status can be improved for many groups of the population by making proper food choices. Making good food choices do not come naturally to people. The ability to select nutritionally balanced meals needs to be learned (Motes, 1980).

The need for nutrition education is cited by many professionals and incorporated into the philosophy and activities of many professional organizations. Among these are the Society for Nutrition Education (SNE) which was formed in 1969 and publishes the Journal of Nutrition Education. The National Association of College and University Food

Services (NACUFS) included a nutrition statement in the association's purpose and goals, identifying the integration of nutrition education in it's overall purpose (NACUFS, 1986). NACUFS has also established standards of practice for nutrition education programming in the NACUFS 1981 Professional Standards Manual. The American Dietetic Association's (ADA) 1985 Policy Statement on Nutrition Education for the Public stated that their role as an organization is "improving the ability of the public to make informed nutrition decisions" (The American Dietetic Association [ADA], 1985, p. 980). The American Dietetic Association's 1973 Position Paper on Nutrition Education stated that "nutrition education must be a continuing process throughout the life cycle" (ADA, 1973, p. 429).

Despite the professionals' identified need for nutrition education at all levels, there is a lack of research on nutrition education in college and university food services. If nutrition education programming is being conducted at a college level, it is not being documented, nor are the results being measured.

Purpose

Although there was a wealth of literature on nutrition education in elementary school food services, there was little published research in nutrition education for college and university food services. This may be due to a lack of research studies in this area, and/or a lack of actual nutrition education programming. Hence, a study of nutrition education programming in college and university food services in Region VII of NACUFS was conducted.

The purpose of this study was to identify nutrition education programming being offered in college and university food services in Region VII of NACUFS, and to determine the factors which influence the programming. The factors analyzed include the size of the food service operation, the nutrition background of the food service director, the years experience of the food service director, and the food service directors' opinion on the

importance of nutrition education. A further purpose of this study is to make suggestions and recommendations for nutrition education in college and university food service based on the findings.

Objectives

The objectives of the study are as follows:

1. To determine the relationship between the size of the food service operation and nutrition education offerings;
2. To determine the relationship between the food service directors' nutrition background and nutrition education offerings;
3. To determine the relationship between the food service directors' length of experience in food service and nutrition education offerings;
4. To determine the relationship between the food service directors' opinion on the importance of nutrition education in college and university food service, and nutrition education offerings; and
5. To make suggestions and recommendations for nutrition education in college and university food services based on the findings of this study.

Hypotheses

The following null hypotheses are to be tested.

H_1: There will be no significant relationship between the size of the food service operation and nutrition education offerings;

H_2: There will be no significant relationship between the food service directors' nutrition background and nutrition education offerings;

H_3: There will be no significant relationship between the food service directors' length of experience in food service and nutrition education offerings;

H_4: There will be no significant relationship between the food service directors' opinion of the importance of nutrition education in college and university food service, and nutrition education offerings.

Limitations

The following limitations were recognized for this study.

1. The sample of food service directors was restricted to member schools in the Region VII of NACUFS. These included the states of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas.
2. The questionnaires were mailed to the participants for completion rather than being administered in person.
3. The sample was limited to voluntary responses.

Assumptions

The following assumptions are acknowledged by this study.

1. Nutrition education programming is being offered by members of NACUFS Region VII.
2. There is a relationship between nutrition and health (National Academy of Sciences, 1985).
3. Nutrition education can effect a change in the eating patterns of college students (Davis-Chervin, Rogers, & Clark, 1985).
4. There is a need for nutrition eduction programming in college and university food services.

Definitions

In order to clarify terms used in this study, the following definitions are given.

Registered Dietitian (RD)

> A specialist educated for a profession responsible for the nutritional care of individuals and groups . . . who has successfully completed the examination for registration [with the American Dietetic Association] and maintained continuing education requirements (ADA, 1974, p. 661).

Food Service Director The Food Service Director, regardless of the title the individual institutions place on that position, is the person who has the overall responsibility for the division of food services, be they contract, ala carte, or cash operations. This person is the link between the service department he/she represents and the academic and administrative departments that make up the college or university. It is that person's vital responsibility to ensure that the services provided to the customers "are the medium through which the Dining Program meets the educational missions of a university" (NACUFS, 1983).

National Association of College and University Food Services (NACUFS) NACUFS, established in 1953, is the professional organization for those working in college and university food services. Membership is by institution rather than by individual. Membership is limited to those schools with "self-operated food services," as opposed to contracted food service operations (NACUFS, 1983, p. 6).

Nutrition Education Programming Nutrition education programming is the planned activity of dispensing nutrition information "from nutritionally sound sources" for "students, customers, and staff," utilizing "various methods . . . to present basic, concise, nutrition information (posters, handouts, menu notes, line signs, etc.)" (NACUFS, 1981, p. VI 1).

Nutrition Education Specialist The nutrition education specialist is that person identified by The American Dietetic Association, in their 1978 Position Paper on the Scope and Thrust of Nutrition Education, as the one uniquely qualified to develop and coordinate nutrition education programs. Competencies for the nutrition education specialist include being a registered dietitian with in-depth education in curriculum development, behavior science, and communication skills (ADA, 1978).

Size of Food Service Member institutions of NACUFS are grouped together according to size for the payment of dues, and competition for awards. The size of the food service operation is determined by it's annual revenue, as follows.

Small Food Service	up to $3,999,999
Medium Food Service	$4,000,000 to $5,999,999
Large Food Service	$6,000,000 or more

REVIEW OF LITERATURE

The United States is characterized as a "civilization increasingly burdened with obesity, degenerative diseases, and disorders of aging [which] should be increasingly concerned over the selection of an optimum diet" (Ahrens & Boucher, 1978, p. 613). As Todhunter (1969) stated, there is "no instinct to guide man in the proper selection of foods. Nutrition education is a universal need" (p. 8).

The purpose of this chapter is to develop a rationale for the study, based on current literature pertaining to nutrition education. The review of literature contains sections on: 1) the American diet; 2) college diet; 3) the relationship between health and nutrition; 4) the need for nutrition education; and 5) nutrition education programs in college and university food services.

The American Diet

The United States government realized a need to have data available as to the eating habits of Americans. Data concerning eating patterns were necessary to ensure the food supply of the country through agricultural policies. Also, information about food consumption patterns was needed to determine revisions in such government programs as school lunch and food commodities. Therefore, the U.S. Department of Agriculture (USDA) was charged with the responsibility of conducting a nationwide survey of food intakes by households. USDA has conducted six such surveys periodically (1936, 1942, 1948, 1955, 1965, and 1977). However, it was only the last two surveys that provided information on food intakes of individual members of households. An analysis of

nutrient levels based on food consumed, reported in the 1965 study, showed that three minerals; calcium, iron, and magnesium, plus six vitamins; vitamin A, thiamin, riboflavin, vitamin B_6, vitamin B_{12}, and vitamin C averaged less than the Recommended Dietary Allowances (RDA) for at least one sex-age group (USDA, 1969). The 1977 USDA Food Consumption Survey showed some improvement. Protein, riboflavin, niacin, and vitamin C intakes met the 1980 RDA for all groups (USDA, 1981). Males ages 15-18 and 19-22 were found to have adequate intakes of most nutrients. Males in these age groups were found to have less than adequate intakes of magnesium and vitamin B_6. Females of the same age groups, however, were found to have less than adequate intakes of calories, calcium, iron, magnesium, phosphorus, and vitamin B_6 (Pao, Midde, Burk, 1985).

The Ten-State Nutrition Survey of 1968 - 1970 found that a "significant proportion of the population surveyed was malnourished" (Nutrition Today, 1972, p. 6). The data from the Ten-State Nutrition Survey were analyzed in terms of race and very broad age ranges. The closest range to a college age group is the age range of 17-59. The data were further grouped according to low-income ratio states (Kentucky, Louisiana, South Carolina, Texas, and West Virginia) and high-income ratio states (California, Massachusetts, Michigan, New York, and Washington). Findings indicated that in the 17-59 age group, males and females of all three ethnic groups (black, white, and Hispanic), in the high-income ratio states had minimal to low intakes of protein, Vitamin A, Vitamin E, riboflavin, thiamin, and iodine. Obesity was reported with a high frequency among black and white females, 17-59 in all states. Low intakes of iron were reported for white females, 17-59 in high income ratio states. Minimal to low intakes were reported among males and females, for all three groups in the low-income ratio states for the nutrients iodine, thiamin, and protein. Vitamin A intakes were minimal for this age group among blacks and whites in low income states. Vitamin C intakes were low to minimal among black, white, and Spanish females, between 17-59 years of age, and Hispanic males, between 17-59 years of age.

The first National Health and Nutrition Examination Survey (NHANES I) conducted in 1971-1974 was based on 24-hour recalls of food consumed for individuals 1-74 years of age by age, sex, race, and income levels (National Center for Health Statistics, 1977). Among the 18-19 year olds, black males were found to have low intakes of iron and vitamin A; while all females in this age group were found to have low intakes of iron, vitamin A, and calories. Among the 20-24 year olds, males below the poverty line reported low intakes of vitamin A; while females in this age group reported very low intakes of iron (only 56 percent of the standard), and moderately low intakes of vitamin A, calcium and calories.

The second National Health and Nutrition Examination Survey (NHANES II,) conducted 1976-1980, was based on 24 hour recalls of food consumed for individuals 6 months - 74 years of age by age, sex, race, and income levels (National Center for Health Statistics, 1983). The method of obtaining total dietary intake was the same as that used in NHANES I. The findings though, were reported in a different format. Findings from NHANES II indicated that 66 percent of women ages 18-24 did not consume adequate amounts of calcium. Further, in the 18-24 year age group, 22 percent of all men did not consume recommended amounts of vitamin A, and 87 percent of all women did not consume recommended amounts of iron. In addition, women ages 20-44 appear to be at risk of folate deficiency (Pilch & Senti, 1985).

The consequences of choice were demonstrated by the NHANES II findings for calcium. The fact that 66 percent of all women were deficient in their calcium intakes may be explained in part through food choice, by examining the soft drink consumption patterns in the U.S. Recent government publications indicated that more than 50 percent of the U.S. population consumed carbonated soft drinks (Pao, 1982), and that the use of soft drinks increased considerably over the past 15 years (Morgan, Stults, & Stampley, 1985). Based on the findings of the 1977 Food Consumption Survey, Pao (1981) determined that teenage boys, 15-18 years of age, had the largest intake of carbonated beverages per day,

averaging 13 ounces per individual, or 22 ounces per soft drink consumer. Three-fifths of the teenage boys reported drinking soft drinks (the largest portion of any sex-age group). About one-half of the teenage girls reported consuming soft drinks. Soft drinks were found to provide five to six percent of the energy intake for 19-22 year olds. Guenther (1986) analyzed teenagers use of soft drinks in relation to the decrease in milk consumption. Soft drink and milk consumption were found to be negatively correlated. Soft drinks were just as likely to be consumed at lunch or dinner as for snacks. These results suggested that teenagers had substituted soft drinks for milk with their meals. Boys who were low soft drink consumers had diets that provided 94 percent of the recommended calcium allowances; while those consuming high amounts of soft drinks had diets that provided 89 percent of the recommended calcium allowances. Of greatest concern was the effect of soft drinks on calcium intake by teenage girls. Those girls who did not consume soft drinks had calcium intakes that were only 75 percent of the RDA; while those who consumed soft drinks had intakes which were even lower. The diets of low soft drink consumers provided 66 percent of the RDA, and the diets of high soft drink consumers provided only 59 percent of the RDA for calcium.

The Dietary Intakes of College Students

The findings from nutrition surveys of college students were not very different from those findings in the general population. The eating habits of college students at the University of Minnesota were studied through analyses of seven day diet surveys (Ostrom and Labuza, 1977). The researchers found that on the average, an adequate intake of most nutrients was being consumed. Vitamin A however, was deficient in a large percentage of the students' diets. Also, the majority of females surveyed consumed less than 60 percent of the RDA for iron.

Nutrient intakes and eating habits of college women at Cornell University were studied (Jakobovits, et. al., 1977). Residence hall versus apartment living did not seem to

influence dietary adequacy. On the average, the women ate 5.14 times per day, including snacks. The mean intakes of the group showed that the RDA was exceeded for all nutrients, except energy, thiamin, and iron. Intakes for energy and thiamin were slightly below the RDA. The very low intake of iron was consistent with the findings of other studies.

Dietary habits of 150 caucasian college students at Virginia Polytechnic Institute and State University were surveyed in 1977. Men consumed significantly more calories, protein, iron, thiamin, riboflavin and niacin than women. Mean daily nutrient intakes reported by men were 2,747 kilocalories, 113 grams protein, and 15.5 milligrams iron. Mean daily nutrient intakes reported by women were 1769 kilocalories, 73.5 grams protein, and 11.6 miligrams iron. The subjects' intakes of energy, protein, and iron were similar to those reported in the NHANES I study for the 18 to 44 year old group. The students vitamin C levels, however, were much higher than those reported in NHANES I, (87-106 mg. ascorbic acid per day). Many subjects reported consuming 8 to 24 fl. oz. of orange juice per day. Again, women in this study did not consume adequate amounts of iron. Thirty-seven percent of the women reported consuming less than 10 mg dietary iron per day (RDA for this group is 18 mg of iron) (Driskell, et. al., 1979).

A recent study on the beverage preference of college students confirms the findings reported previously. Although the distribution of beverage selection varied according to the time of year, the percentage of carbonated soft drinks consumed by students never dropped below 50 percent of the total daily beverage consumption (Kahn, 1980).

The Relationship Between Health and Nutrition

The Food and Nutrition Board of the National Research Council was formed in 1941, with the purpose of encouraging sound nutritional practices by the U. S. population (National Academy of Sciences, 1980). The first action of the Board was to recommend allowances of essential nutrients that would assure adequate nutrition in the U.S. Thus,

the first Recommended Dietary Allowances (RDA) were developed. The allowances were calculated to include a "safe margin" to cover differences in requirements among individuals. The safety margin, meant increasing the average requirement of a mutrient by an amount sufficient to meet the needs of nearly all the members of the population, as well as to account for inefficient utilization by the body, of the nutrients consumed. The margin of safety of at least two standard deviations above the mean was added to the minimum requirements for each nutrient. As available scientific knowledge expanded, it was necessary to re-evaluate and revise the RDA. The ninth edition was published in 1980 (Food and Nutrition Board, 1980). The RDA have been utilized as the basis for ensuring the provision of the food supply, establishing standards for food assistance programs, interpreting food consumption records, establishing guidelines for nutrition labeling of foods, and developing nutrition education programs.

The United States Department of Agriculture (USDA) was developing food guides since 1943. To translate the recommended allowances into familiar diet patterns, certain classes of foods were included in the diet in specified amounts so that a person with no scientific knowledge of nutrition would be guided in the selection of an adequate diet. The recommendations became known as the Basic Seven, developed as part of the National Wartime Nutrition Program of the Research Administration of the Department of Agriculture in 1943. This guide was the basis of practically all nutrition education programs from 1943 until its revision in 1956. The Basic Seven in 1943 and the Basic Four (1956) were used in nutrition education to assist individuals to plan adequate diets that meet the RDA for various age-sex groups. The food guides allowed the public to select servings of foods in the given groups to meet their needs, without calculating amounts of nutrients.

Recently USDA released its second edition of Dietary Guidelines for Americans (1985). The guidelines incorporated seven general recommendations for health. These guidelines were broad enough to apply to anyone interested in health. The guidelines were

as follows.

1. Eat a variety of foods.
2. Maintain desirable weight.
3. Avoid too much fat, saturated fat and cholesterol.
4. Eat foods with adequate starch and fiber.
5. Avoid too much sugar.
6. Avoid too much sodium.
7. If you drink alcoholic beverages, do so in moderation (USDA, 1985, pp. 12-13).

The dietary guidelines were used in nutrition education programs to shift the emphasis to maintaining optimum health from meeting basic requirements, as presented in the USDA food guides.

Several other agencies noted the relationship of diet to health and provided guidelines for the public. The Senate Select Committee on Nutrition and Human Needs in 1977 released Dietary Goals for the United States. The U. S. Dietary Goals diagramed a composite of the typical "American diet," and then proposed an ideal diet composition made up of 30 percent fat (10 percent saturated and 20 percent poly and mono unsaturated); 12 percent protein; and 58 percent carbohydrate (40 to 45 percent complex carbohydrate and 15 percent sugar). Although the intentions of the committee were sound, to identify a "typical" diet in such a diverse country was difficult. Even more difficult was the task of promoting changes in diet based on that typical reference. The dietary goals did not address individual dietary requirements, or the other lifestyle issues involved in disease prevention.

The Food and Nutrition Board, in an attempt to address the flood of dietary recommendations made to the American public, published Toward Healthful Diets (Food and Nutrition Board, 1980), in hopes of reducing the confusion resulting from these many conflicting recommendations. The statement developed in this publication emphasized the Surgeon General's report, Healthy People (Public Health Service [PHS], 1979), which reported that the American population had never been healthier. Many of the recommendations made to the public stemmed from the hope that certain chronic

degenerative diseases may be prevented. While the Board recognized that obesity was the most common dietary concern in the Western world, and that obesity had been associated with such diseases as hypertension, diabetes, coronary heart disease, and gall bladder disease, recommendations were made in a concise, moderate, and realistic manner.

Much of the credit for the shift in emphasis within the health profession from disease treatment, to disease prevention and the promotion of health may be attributed to Healthy People (PHS, 1979), the first Surgeon General's report on health promotion and disease prevention. The report announced five health goals for improving the health of the U.S. population at the five major stages of life, including, healthy infants (below age 1), healthy children (age 1-14), healthy adolescents/young adults (age 15-24), healthy adults (age 25-64), and healthy older adults (age 65+). The report also identified healthy strategies in three areas: preventative health services for individuals; health protection for population groups; and health promotion for population groups.

The area of preventive health services addressed such topics as family planning, pregnancy and infant care, immunizations, sexually transmissible disease services, and high blood pressure control. Topics in the area of health protection ranged from toxic agent control, to fluoridation of community water supplies. The final strategy area, health promotion, included the topics of smoking cessation, reducing misuse of drugs and alcohol, exercise and fitness, stress control, and improved nutrition. The strategies and targeted areas identified in the Surgeon General's report provided the basis for the development of specific health objectives for the nation.

Promoting Health/Preventing Disease: Objectives for the Nation (PHS, 1980) set out specific and measurable objectives based on the Surgeon General's goals for 1990. The objectives were extensive; identifying 226 objectives in 15 priority areas. One of the 15 priority areas was nutrition. Within the area of nutrition 17 objectives were identified ranging from: decreasing the proportion of pregnant women with iron deficiency anemia to establishing a comprehensive national nutrition status monitoring system. There were

three objectives that directly relate to nutrition education.

n. By 1985, the proportion of employee and school cafeteria managers who are aware of, and actively promoting, USDA/DHHS Dietary Guidelines should be greater than 50 percent.
o. By 1990, all States should include nutrition education as part of required comprehensive school health education at elementary and secondary levels. (In 1979, only ten states mandated nutrition as a core content area in school health eduction.)
p. By 1990, virtually all routine health contacts with health professionals would include some element of nutrition education and nutrition counseling. (PHS, 1980, p. 150).

Furthermore, two other objectives, while they did not directly address nutrition education activities, produced implications in the area of nutrition education.

j. By 1990, 70 percent of adults should be able to identify the major foods which are: low in fat content, low in sodium content, high in calories, high in sugars, and good sources of fiber.
k. By 1990, 90 percent of adults should understand that to lose weight, people must either consume foods that contain fewer calories or increase physical activity, or both (PHS, 1980, p. 149).

To achieve increased public awareness of food sources of "problem" nutrients, and sound weight loss methods, nutrition educators must direct attention to the development and presentation of concise material in support of the objectives.

In 1986 a follow-up report, The 1990 Health Objectives for the Nation: A Midcourse Review was released, which charted the progress of the national health goals. The report was quite positive and optimistic. Of the 226 initial objectives, only 60 appeared to be unattainable, based on trends established, and only eight objectives were moving in the opposite direction from the 1990 target (PHS, 1986, p. 1). Baseline data were not available on two of the three nutrition education objectives. The objective dealing with mandated nutrition education in schools made minimal progress, moving up from 10 to 12 states with mandated nutrition education components.

The established relationship between health and nutrition was evidenced by a flood of dietary recommendations to the public, designed to prevent disease and promote health. The relationship between health and nutrition, combined with the abundance of dietary recommendations had many implications for nutrition education. These implications

also presented a challenge to nutrition educators to present accurate, concise information to the public.

The Need for Nutrition Education

The need for nutrition education had become a real issue in many areas of education, health care, food service, and government programs, since the White House Conference on Food, Nutrition and Health in 1969. The conference, held in response to the results of the Ten-State Nutrition Survey, made recommendations for nutrition education in the areas of popular education, elementary and high schools, advanced academic teaching community teaching, and disadvantaged groups. The Final Report of the White House Conference on Food, Nutrition and Health stated in section 4, panel 3, "It recognizes the importance of making 'good nutrition' a meaningful phrase at all age levels and in all walks of life." (White House Conference, 1970, p. 25) The White House Conference recognized that food service facilities were an appropriate environment for nutrition education activities, recommending "maximum use of food service facilities . . . for . . . nutrition education for students and adults" (1970, p. 25).

The American Dietetic Association's 1973 Position Paper on Nutrition Education of the Public states that the

> fundamental philosophy of nutrition education is that efforts should focus on the establishment and protection of nutritional health rather than on crisis intervention. Nutrition Education is needed regardless of income, location, or cultural, social, or economic practices or level of education (p. 429).

The American Dietetic Association, in 1978, expanded its position on nutrition education to delineate not only the scope and thrust of nutrition education, but also to identify the qualification of those responsible for designing and implementing programs. The American Dietetic Association stated that the

> registered dietitian is the health professional uniquely prepared to design and develop programs to prepare educators and health professionals, and to educate and motivate individuals, families, and groups, for the ultimate goal of achieving eating practices that will contribute to optimum nutritional

status (ADA, 1978, pp. 304-305).

In 1985, the American Dietetic Association reaffirmed its position with the Policy Statement on Nutrition Education for the Public. As ADA moves toward the development of the National Center on Nutrition and Dietetics, this statement will provide the foundation for the development and implementation of programs for nutrition education through the Center.

The National Association of College and University Food Services (NACUFS) integrated the need for nutrition education throughout it's organizational framework. The Association's purpose stated that among other goals, The Association exists to "advance the cause of good nutrition" (NACUFS, 1986, p. 2). That goal is again repeated in the members' pledge. NACUFS, in order to emphasize the importance of nutrition education, has developed a Nutrition Statement that, along with the Code of Ethics, represents The Association's ideals. This statement sets "as a major priority, the implementation of sound nutrition education programs" (p. 3). Declaring that nutrition education is a proper function of NACUFS, it further suggested the following goals for each member organization:

1. to offer a sound food service program which will insure that customer nutritional needs are able to be met;
2. to promote to its customers sound nutrition principles through nutrition awareness/education programs;
3. to respond to the needs for nutrition information as expressed by its customers;
4. to promote the service and sale of nutritious foods in its cash operations;
5. to develop and implement nutrition awareness/education programs for management, staff, and food service workers;
6. to be responsive to needs, such as services, program options, and staff commitment, which arise as a result of nutrition awareness/education; and
7. to become aware of the importance and the implication of nutrition education within all of the food service industry (NACUFS, 1986, p. 3).

One of the national committees within NACUFS was the Food and Nutrition Awareness Committee. This committees' charge was "to provide the membership with methods for continually conveying nutrition education and awareness to all the people"

they serve. In 1981, NACUFS published the NACUFS Professional Standards Manual, which itemized the standards of practice accepted by The Association, as a tool for members to systematically evaluate their operation. One major heading in the standards manual was the objective to "promote principles of good nutrition through nutrition education" programming (p. VI-1). The following practices were identified not only as a proper, but also as a desirable activity for member food services.

1. nutrition awareness/education program for students, customers, and staff is in operation;
2. the program is monitored by a professionally qualified registered dietitian;
3. a nutrition educated person is responsible for the implementation of nutrition education program;
4. questionnaires are used to assess the present level of nutritional knowledge of student, customers, and staff;
5. various methods are utilized to present basic, concise, nutritional information (posters, handouts, menu notes, line signs);
6. nutritionally sound responses are given to food fad questions;
7. campus media is used to dispense nutritional information;
8. nutritional information is from nutritionally sound sources and referenced;
9. nutritional resource material is available;
10. meetings with student organizations assist in sharing nutritional information;
11. student nutrition and institutional management majors are involved in developing the departmental nutrition program; and
12. the food service program is designed to insure that clientele nutritional needs may be met. (NACUFS, 1981, p. VI-2).

Nutrition Education Programs in College and University Food Services

Nutrition education was an activity that occurred in several college food services. There were dietitians on staff in college food service operations for many years. According to Fairbrook (1984), the

> specialized knowledge which they [dietitians] brought to the college campus was really not fully appreciated nor properly utilized until the 1970's, when the students growing interest in ecology, health matters, vegetarianism, organic and natural foods found the campus dietitians ready and able to help. Now a decade later, almost every college and university food service manager realizes that one major responsibility is to educate the students in nutrition (p. 85).

In 1981, the University of Iowa Food Service responded to their students' requests for nutrition information with a weight loss seminar for a womens residence hall (Hamphill, 1981). The seminar was based on behavior modification concepts. The participants completed a behavioral contract, kept a food diary, and identified personal consequences of their behavior, both positive and negative.

The Virginia Polytechnic Institute and State University Food Service pooled their resources and creativity to develop 'Nutrek, Flight to Fitness, the Healthful Frontier' (Vance, Domokos-Bays, DeMicco, McFarland, Vitt 1981). NUTREK, NUTR(ition) and EK(exercise), was a nutrition education and exercise program for the food service workers. It utilized the team approach, involving the resources of Food Services, Medical Infirmary, and Physical Education Departments of the university. The program consisted of a three phase exercise component and five phase nutrition component that spanned 10 weeks.

In March 1981, Oklahoma State University Food Service offered a nutrition education program for National Nutrition Month (Holland, 1981). The program was developed and coordinated by the dietetic interns as a part of their work experience in University Food Service. The overall theme was 'Hit a Home Run - Score with Proper Nutrition'. The interns presented a different topic each week through use of posters, table tents, skits, seminars, and pamphlets. In addition, they appeared on television and radio talk shows, developed mini-information lines for the University electronic billboard, and had several articles in local and campus newspapers.

Fairbrook, in his recent text, Public Relations and Merchandising: A Handbook for College and University Food Services (1984), summarized 11 nutrition education programs. Although they vary in content, most were similar in methods, utilizing table tents, posters, lectures, 'nutrition centers', nutrition counseling for individuals and groups, newsletters, line signs, and menu notes. Highlighted were the programs of three campuses; the University of Massachusetts, Montana State University, and the University

of California/Davis. The book included samples of materials used by several of the food services.

Since 1984, Cornell dining conducted a program known as NU DIRECTIONS (Kerwawycz, 1985). Topics for the program were determined by annual nutrition surveys, which polled the preferences and concerns of the students on the board plan. Printed educational material was made available. Also, junior and senior level nutrition majors held weekly nutrition panels in the dining halls. The evening menu was analyzed in terms of calories, carbohydrate, protein, fat, sodium, and cholesterol. Customers asked questions of these "nutrition experts". A registered dietitian was also available to provide nutrition counseling to clients with special diet needs.

The Student Dietetic Association of Virginia Polytechnic Institute and State University developed a nutrition newsletter, Nutri-Notes as their project for the academic year (Bedford, Domokos-Bays, 1985). After the project was completed, the students were surveyed to determine if the newsletter had achieved the stated objectives of promoting awareness of available nutrition information, while providing sound food and nutrition information. Survey results indicated that university students benefitted from the newsletter. Students stated that they had more knowledge of nutrition, and they had increased their contacts with the dietitians in the food service area.

Davis-Chervin and colleagues (1985) offered a point-of-choice nutrition information program in two food service operations on the Stanford University campus. The education program included information on specific nutrients in the foods offered: total calories, milligrams of cholesterol, and percentage of calories provided by fat. This information was calculated and presented for all entrees, milk, and selected condiments. At the head of the serving line was a three-component display that presented: 1) information, including definitions for such terms as cholesterol and saturated fat, and descriptions of disease risk factors related to diet; 2) recommendations for alternative food choices and ways to make dietary change; and 3) basic information on calories, cholesterol, and

percentages of calories provided by fat. This poster was displayed in both residence hall cafeterias. In addition, one of the cafeterias had nutrient display cards positioned on the sneeze guards above the food at the point of selection. These display cards listed the number of calories, milligrams of fat and percentage of calories from fat for each food item. A study was conducted of the number of servings taken of each item throughout the academic year. The one cafeteria without the point-of-choice display cards was used to determine baseline eating habits and the variation to seasons. Results indicated that food-selection behavior was influenced in the cafeteria that provided the point-of-choice nutrition information, but remained unchanged in the second cafeteria.

The Department of Foods and Nutrition at The University of Illinois worked jointly with university housing and health service staff to present, Get Psyched for Good Health, an eight-week cafeteria based nutrition education program (Ries & Schoon, 1986). Pre-test and post-test questionnaires were administered to all participating residence hall students. Questionnaires were designed to determine the students' level of nutrition knowledge and attitude. Nutrition information was presented to students in two of the three residence hall complexes. The third complex served as a control group. The nutrition information included eight pamphlets that highlighted the relationship between diet and good health, and provide suggestions for making food choices consistent with good health. In addition, point-of-choice cards were displayed on the line above the majority of food items served, indicating graphically, the number of calories per serving and the percent of energy provided by protein, fat, and carbohydrate. Results indicated that the program appeared to increase students' knowledge of nutrition, but did not influence student attitudes toward nutrition.

The current literature indicated that several colleges and universities offered nutrition education programs in their food service operations. Of all the programs reviewed, only those from Virginia Polytechnic, Stanford University, and the University of Illinois evaluated the effectiveness of the nutrition education programs offered.

Summary

A review of current literature pertaining to this study indicated that the American diet was deficient in several nutrients. Likewise, the diet of American college students was not adequate. With the relationship between health and nutrition such a vital link in preventing disease, it was thought to be imperative that the public be provided with accurate nutrition information from which to base their food selection decisions. The need for nutrition education had been cited by many professional organizations, including The National Association of College and University Food Services.

Many college students were on their own for the first time. As they assumed responsibility for their own nutrition and health, lifetime eating habits continue to form. Therefore, college students were a particularly appropriate target audience for nutrition information. As the literature indicated that nutrition information at the point-of-choice influenced students food selection behavior, the cafeteria was an effective, appropriate place to offer nutrition education programming.

CHAPTER III

PROCEDURES

This chapter describes the procedures used in the study, including type of research design, population and sample, questionnaire development, data collection, and statistical analysis of the data. The general purpose of the study was to describe the nutrition eduction programming in college and university food services in NACUFS Region VII, and to make recommendations based on the findings of the study.

Type of Research Design

This study used the mailed survey type of research design. A survey is best used "in describing current practices or beliefs with the intent of making intelligent plans for improving conditions or processes in a particular local situation" (Compton and Hall, 1972, p. 139).

Population and Sample

The population consisted of food service directors of member institutions of NACUFS. The sample was limited to Region VII of NACUFS, which includes the states of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas. The sample was taken from the NACUFS Directory Update 1986-87, and included 55 food service directors. This number represented the entire Region VII membership as of the 1986 publication, and approximately 10 percent of the total 550 members of the NACUFS national organization.

Questionnaire Development

Most published research in the area of nutrition education in food service is based on elementary and secondary school programs. No valid instrument was available that could be adapted to this study in a college setting. The questionnaire (see Appendix A) was developed by the researcher to fulfill the objectives of this study.

The primary objective was to determine if nutrition education programming was offered, and to develop a profile of programs offered. The NACUFS professional standards for nutrition education programming provided the basis of question development for the nutrition education profile section. A question was developed for each nutrition education standard (listed on p. 17). The questions that asked about topics offered and methods utilized in dispensing information were developed in a multiple choice style to assist respondents in thoroughness. The lists of possible topics and methods were developed on the basis of nutrition education networking information shared at NACUFS conferences. A question was developed to provide those food service directors not offering nutrition education, an opportunity to state the reasons it was not offered. Further, questions were developed to determine each of the variates; namely, the size of food service operations, the food service directors' nutrition background, the food service directors' length of experience in food service, and the food service directors' opinion of the importance of nutrition education in college and university food services.

The questionnaire has two sections. Section A provides background information. Questions 1 - 2 provide data that are used to describe the sample. Questions 3 - 8 provide data that are used to describe the respondents. Question 9 provides data as to the opinion of the respondents. Section B provides data that are used to describe the nutrition education programming that is being offered.

For ease of response and tabulation, the closed-form type of questionnaire is used. "It is easy to fill out, takes little time, keeps the respondent on the subject, is relatively objective and is fairly easy to tabulate and analyze" (Best, 1977, p. 158). The sequencing of

questions is the funnel-type, the more general demographic questions first, followed by more specific respondent questions, and finally the most specific questions pertaining to the nutrition education programming.

The criterion variable was whether nutrition education offerings. The variates of this study include the size of the food service operation (question 2), the food service directors' length of experience in food service (question 5), the nutrition background of the food service director (question 6 - 8), and the food service directors' opinion on the importance of nutrition education in college and university food service (question 9).

To establish construct and content validity the instrument was judged by four nutrition/nutrition education research professionals in higher education. To establish clarity and consistency of response, the questionnaire was pre-tested by five food service professionals who were not a part of the final sample.

Data Collection

Each food service director received a cover letter (see Appendix B) explaining the nature of the study and the importance of their participation, along with a questionnaire and self-addressed envelope for reply. The return envelopes were coded with a reference number for determining which respondents have returned the questionnaire for the purpose of follow-up, and to protect the respondents anonymity. Eight working days were allowed for the return of the questionnaire. Post card follow-ups were made to those food service directors not returning the questionnaire. To draw attention to the questionnaire and hopefully increase the rate of response, the questionnaire was printed on colored paper with a graphic design of an apple in the corner. The follow-up post cards were also printed on the same color card stock and carried the same graphic design as the questionnaire. A second follow-up was conducted by randomly selecting from those food service directors not responding to the questionnaire. This follow-up was administered by telephone.

Statistical Analysis

General descriptive data were obtained from the food service directors' responses to the questionnaire. Numbers and percentages were utilized to present this data in a descriptive profile. In addition, Contingency Coefficient (C) was applied to the null hypotheses (formulas follow). Contingency Coefficient was selected because it is a nonparametric measure of correlation of nominal data. A level of significance was established as $p<.05$, for the purpose of this study.

Contingency Coefficient was calculated by first arranging the frequencies in a contingency table. Expected frequencies, were computed for each cell by determining what frequencies would occur if there were no association or correlation between the two variables. The expected frequencies were computed with the following formula.

$$f_e = \frac{column\ total \times row\ total}{\mathcal{N}}$$

The larger the discrepancy between these expected values and the observed values, the larger the degree of association between the two variables, and thus the higher the value of C. Contingency Coefficient was calculated by the use of the following formulas.

$$\chi^2 = \sum \frac{(f_o - f_e)}{f_e}$$

$$C = \sqrt{\frac{\chi^2}{\chi^2 + \mathcal{N}}}$$

(Siegel, 1956)

CHAPTER IV

RESULTS AND DISCUSSION

Description of Sample

To determine the nutrition education programming offered by college and university food services, surveys were administered to all members of NACUFS Region VII. From the 55 questionnaires mailed, 29 were returned for a 53 percent response. To increase the response rate, a telephone follow-up was conducted by randomly selecting from those food service directors not previously responding. After the telephone follow-up, a total of 41 responses were received for a 75 percent response rate. All states in Region VII were represented by the respondents, in a manner which closely resembles the distribution of the actual regional membership. A summary of the number of respondents by state, compared to the number of members by state is presented in Table I.

TABLE I

REGIONAL MEMBERSHIP AND RESPONSE BY STATE

	Regional Membership		Respondents	
	Number of Members	Percent of Total Members	Number of Members	Percent of Total Responses
Arkansas	5	9	5	12
Louisiana	7	13	4	10
New Mexico	1	2	1	2
Oklahoma	12	22	11	27
Texas	30	55	20	49
Total	55	101*	41	100

*Percent total equals more than 100% due to rounding procedure.

About one-half of the members in NACUFS Region VII were from small colleges and universities. Responses by total school enrollment are presented in Table II

TABLE II

COMPOSITION OF SAMPLE ACCORDING TO SCHOOL ENROLLMENT

	Responses	
	Frequency	Percent
less than 5,000	19	46
5,000 - 9,999	5	12
10,000 - 14,999	5	12
15,000 - 19,999	1	2
20,000 or more	11	27
TOTAL	41	99*

*less than 100 percent due to rounding procedure

Personal Data Related to the Food Service Directors

Age of Food Service Directors

The data concerning the age of the food service directors (Table III) revealed that over one-third, 15 (37 percent) were 36-45 years of age. Nine (22 percent) were 26-35 years of age; and nine (22 percent) were 46-55 years of age. Seven (17 percent) were 56 years or older; and one (two percent) was under 25 years of age. Over three-quarters of the food service directors were 36 years of age or older.

TABLE III

COMPOSITION OF SAMPLE ACCORDING TO AGE OF RESPONDENTS

	Responses	
	Frequency	Percent
25 and under	1	2
26 - 35	9	22
36 - 45	15	37
46 - 55	9	22
56 and over	7	17
TOTAL	41	100

Sex of Food Service Directors

The data concerning the sex of the food service directors indicated that women were employed fairly equal to men in food service management. Nineteen (46 percent) of the food service directors were men. Twenty-two (54 percent of the food service directors were women.

Number of Years Experience in Food Service

The data presented in Table IV indicated that 41 percent of food service directors had 20 years of experience or more in the field; 10 (24 percent) of the directors had 15-19 years experience. Three (seven percent) directors had 6-9 years experience; and two (five percent) had less than five years experience. Over one-half (63 percent) of the respondents had 15 years experience or more. The high frequency of respondents with a large number of years (15 or more) experience may be due to the high level position of the director responding. Food service director is not an entry-level position, but one that requires many years of experience.

TABLE IV

COMPOSITION OF SAMPLE ACCORDING TO NUMBER OF YEARS EXPERIENCE IN FOOD SERVICE

	Responses	
	Frequency	Percent
5 years or less	2	5
6 - 9 years	3	7
10 - 14 years	9	22
15-19 years	10	24
20 years or more	17	41
TOTAL	41	99*

*less than 100 percent due to rounding procedure

Highest Level of Education Completed

The majority (49 percent) of food service directors had bachelors degrees. Nine (22 percent) had masters degrees; while nine (22 percent) had a high school education (Table V). Three (seven percent) had associate degrees. Of the 29 respondents indicating bachelor's or master's degrees, 13 had majors in foods, nutrition, dietetics, or food science. Six indicated majors in business, management, or administration. Three indicated degrees in hotel and restaurant administration, while two had degrees in home economics or vocational home economics. The remaining respondents indicated majors in such fields as psychology; industrial arts, education, social welfare, and general education. Although 13 indicated degrees in nutrition or related fields, only six indicated that they were registered dietitians, and members of ADA. Another two indicated they were members of the American Dietetic Association, but not registered. NACUFS professional standards indicated that nutrition education programs should be implemented by a nutrition education person. Only 13 food service directors had degrees in nutrition. The

standard for a nutrition educated person to implement the program was not met unless nutrition educated people exist at other levels of these organizations.

TABLE V

COMPOSITION OF SAMPLE ACCORDING TO RESPONDENTS HIGHEST LEVEL OF EDUCATION COMPLETED

	Responses	
	Frequency	Percent
High school	9	22
Associate degree	3	7
Bachelors degree	20	49
Masters degree	9	22
Doctorate degree	0	0
TOTAL	41	100

Opinions on the Importance of Nutrition Education

Almost all (90 percent) of the food service directors who responded, believed that nutrition education in college and university food service was very important or important. Twenty (49 percent) indicated that nutrition education was very important; and 17 (41 percent) indicated that it was important. Three (seven percent) directors indicated no opinion. Only one (two percent) director indicated that nutrition education in university food service was unimportant. This individual felt strongly about his opinion, writing the comment "habits are already established," on the questionnaire.

Profile of Nutrition Education

Of the 41 respondents, 24 (59 percent) of the respondents indicated that nutrition education was not offered by their food service in the last two years. The respondents not offering nutrition education indicated some reasons why they thought nutrition education was not provided. These respondents indicated more than one response if applicable. Their responses are summarized in Figure 1.

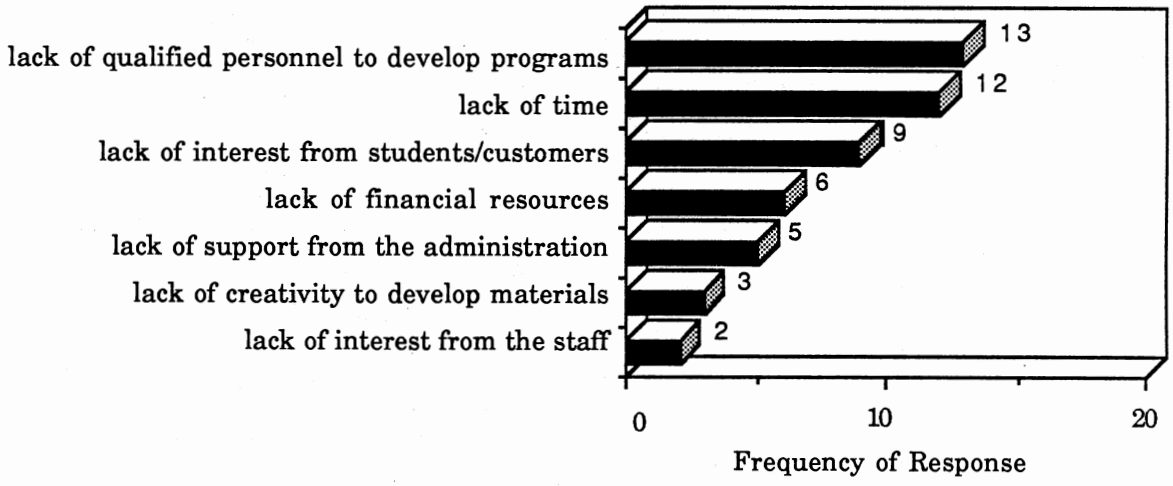

Figure 1. Why nutrition education is not provided

The reason with the greatest frequency of response were 'lack of qualified personnel to develop program' (54 percent), and 'lack of time' (50 percent).

Developing Nutrition Education

Seven (41 percent) of the nutrition education programs were developed by one person. Ten (59 percent) of the programs were developed by more than one person. Examples of people that had input in the development of nutrition education programs included:

registered dietitians (10 or 59 percent); food service directors (eight or 47 percent); nutrition education specialist (six or 35 percent); nutrition students and cafeteria managers (five or 29 percent each); and dietetic interns (four or 24 percent). Four programs involve people from outside the food service department such as university wellness directors, nutrition professors, and dietitian at the student health center. Percentages equal more than 100 percent because respondents checked all responses that applied.

The most often used sources of information for the development of material were professional journals and professional newsletters (each with 14 responses or 82 percent each). Twelve programs (71 percent) make use of food industry bulletins. Ten programs (59 percent) refer to NACUFS Nutrition Information Sheets and current popular magazines. Other references used were videotapes and ready to distribute pamphlets and hand-outs provided by the food industry. Responses are summarized in Figure 2.

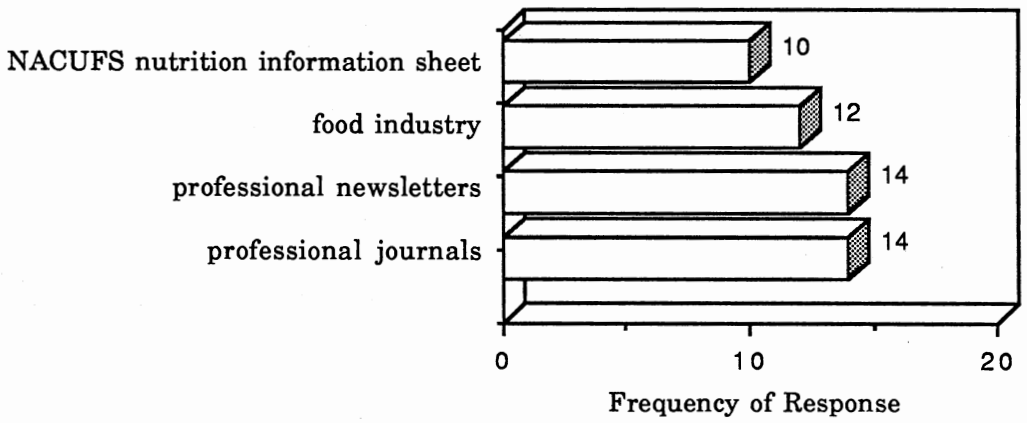

Figure 2. Sources of nutrition information

Nutrition Studies

Only three (18 percent) of the respondents surveyed students and customers to determine their level of nutrition knowledge. Fourteen (82 percent) respondents had not surveyed students or customers. This data indicated that Region VII fell short of achieving the NACUFS professional standard requiring nutrition education programs to survey the level of nutrition knowledge of their student. Likewise, three (18 percent) of the respondents evaluated their nutrition education programs to determine if a change in eating patterns occurred.

Nutrition Topics and Methods of Dispensing Information

A wide variety of nutrition topics had been offered through the nutrition education programs in NACUFS Region VII. Respondents indicated all topics that they offered. Responses to nutrition topics offered are summarized in Figure 3.

The topics offered by the respondents are in keeping with the 1990 Health Objectives. The objectives stressed an increased public awareness of major foods which are: low in fat, low in sodium, high in calories, high in sugar and good sources of fiber. The objectives also stressed the need to increase public awareness of the principles of safe weight loss. The five most frequently presented nutrition topics included calorie counts, basic four food groups, weight reduction, fat and cholesterol, and fitness and health. The targeted topics not reported as offered were sodium, sugar, and fiber.

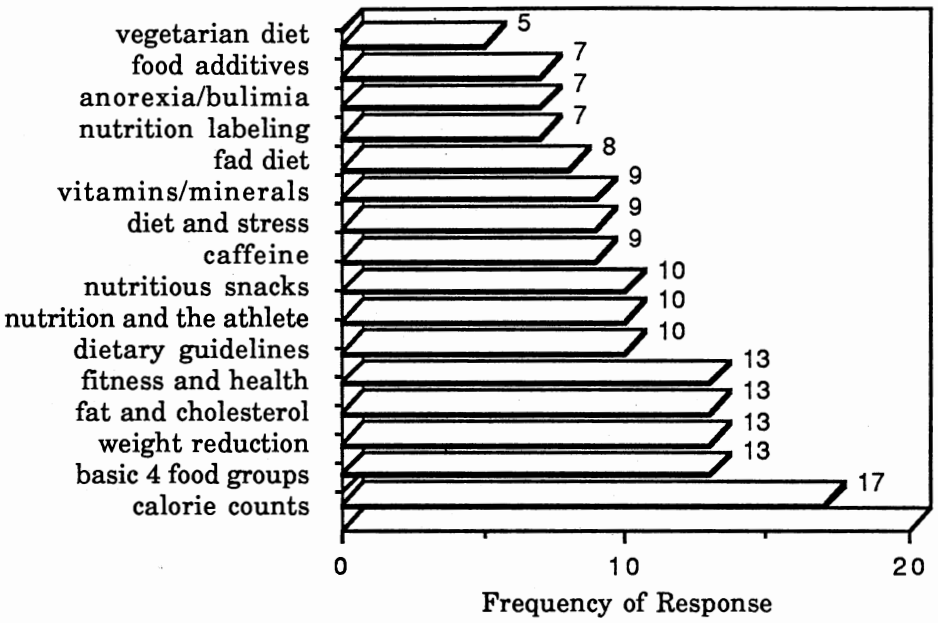

Figure 3. Nutrition Topics Offered

In addition, three respondents wrote in the topics of: fish oils; fiber; women's need for iron; and diet and cancer.

The food services that offered nutrition education programs utilized a variety of methods to dispense the nutrition information to students and customers. The majority of methods utilized were identified as used with no regular frequency. This indicated that nutrition information was only made available on occasion. The methods utilized and frequency with which each method is used are summarized on Table VI.

TABLE VI

METHODS UTILIZED IN DISPENSING NUTRITION INFORMATION AND FREQUENCY WITH WHICH EACH IS USED

	Daily	Weekly	Bi-Weekly	Monthly	Bi-Monthly	Once/Year	No Regular Frequency
Pamphlets/brochures	1	3			1	4	5
Newsletters		1	1	5	1	1	1
Menu notes	1	5		1			1
Table tents		2		2		1	6
Line signs	3	2		1		2	2
Posters		2		3	1	3	2
Badges on servers		1				1	4
Learning centers		1				1	2
Workshops					1	1	2
Speakers				1		2	4
Computer programs							2
Videotapes				2		4	1
PA Announcement							3
Promotional games				2		4	1
Campus newspaper		1					5
Local newspaper							3
Radio							3
Television							3

Summary of Nutrition Profile

The study indicated that NACUFS Region VII needs to increase the number of members offering nutrition education programs since more than one-half did not report offering nutrition education. Of the food services reporting nutrition education programs, the majority met many of the NACUFS professional standards for nutrition education. Most offered a variety of topics (in keeping with the 1990 health objectives), through a variety of methods. Most indicated the methods utilized were at no regular frequency which indicated a lack of consistency in the programming. Over one-half utilized a registered dietitian in developing the programs, while less than 30 percent included

nutrition students and dietetic interns. Food services failed to make use of campus media as a method of dispensing nutrition information. Students were only surveyed by 18 percent of the food services to determine the level of their nutrition knowledge. Overall, those members that offered nutrition education programs made a good effort to meet the NACUFS professional standards for nutrition education programming.

Findings

Contingency Coefficient (C) was applied to the null hypothesis. Analysis of the data is presented below.

TABLE VII

ANALYSIS OF SIZE OF FOOD SERVICE OPERATION IN RELATION TO NUTRITION EDUCATION OFFERINGS

	Nutrition Education Is Offered		Nutrition Education is Not Offered	
	Frequency	Percent	Frequency	Percent
Small	8	47	15	63
Medium	2	12	5	21
Large	7	41	4	17
TOTAL	17	100	24	101*

Contingency Coefficient = .2520
Not significant at .05 level
N = 41
*more than 100 percent due to rounding procedure

d. f. = (2-1)(3-1)
d. f. = 2

H_1: Contingency Coefficient analysis of the data presented in Table VII indicated C

= .2520, a value not significant at the .05 level. The null hypothesis was accepted. no relationship existed between the size of food service operation and nutrition education offerings. Nutrition education was as likely to be offered in a small food service as in a large food service.

TABLE VIII

ANALYSIS OF FOOD SERVICE DIRECTORS' NUTRITION BACKGROUND IN RELATION TO NUTRITION EDUCATION OFFERINGS

	Nutrition Education Is Offered		Nutrition Education is Not Offered	
	Frequency	Percent	Frequency	Percent
Food Service Directors with Degree in Nutrition	6	35	7	29
Food Service Directors without Degree in Nutrition	11	65	17	71
TOTAL	17	100	24	100

Contingency Coefficient = .0637
Not significant at .05 level
N = 41

d. f. = (2-1)(2-1)
d. f. = 1

H_2: Contingency Coefficient analysis of the data presented in Table VIII indicated C = .0637, a value not significant at the.05 level. The null hypothesis was accepted. No relationship existed between the food service directors' nutrition background and nutrition education offerings. There was only a six percent difference in the frequency of food service directors with degrees in nutrition that had offered nutrition education and those that had not.

TABLE IX

ANALYSIS OF FOOD SERVICE DIRECTORS' NUMBER OF YEARS EXPERIENCE IN FOOD SERVICE IN RELATION TO NUTRITION EDUCATION OFFERINGS

	Nutrition Education Is Offered		Nutrition Education is Not Offered	
	Frequency	Percent	Frequency	Percent
less than 10 years	3	18	2	8
10 -19 years	8	47	11	46
20 years or more	6	35	11	46
TOTAL	17	100	24	100

Contingency Coefficient = .1474
Not significant at .05 level
N = 41

d. f. = (2-1)(3-1)
d. f. = 2

H_3: Contingency Coefficient analysis of the data presented in Table VIX indicated C = .1474, a value not significant at the .05 level. The null hypothesis was accepted. No relationship existed between the food service directors' length of experience in food service and nutrition education offerings. There was very little difference between the percentage of responses of those offering nutrition education and those not offering nutrition education. The scale of length of experience in food service was heavy on the 15 years or more end. The data indicated the trend in food service is to attain the position of director after years of experience.

TABLE X

ANALYSIS OF FOOD SERVICE DIRECTORS' OPINION OF THE IMPORTANCE OF NUTRITION EDUCATION IN UNIVERSITY FOOD SERVICE IN RELATION TO NUTRITION EDUCATION OFFERINGS

	Nutrition Education Is Offered		Nutrition Education is Not Offered	
	Frequency	Percent	Frequency	Percent
Very Important	13	76	7	29
Important	3	18	13	54
No Opinion	1	6	3	13
Unimportant	0	0	1	4
Very Unimportant	0	0	0	0
TOTAL	17	100	24	100

Contingency Coefficient = .4220
Significant at .05 level
N = 41

d. f. = (2-1)(3-1)
d. f. = 2

H_4: Contingency Coefficient analysis of the data presented in Table X indicated C = .4220, a value significant at the .05 level. The null hypothesis was rejected. A significant relationship was identified between the food service directors' opinions of the importance of nutrition education in college and university food services and nutrition education offerings. Since there were relatively few negative responses (no opinion, unimportant, and very unimportant), compared to the 90 percent responses that were either important or very important, those three categories of response were collapsed into one one category (no opinion and levels of unimportance). In computing the chi square factors for each cell, the greatest contribution to the total chi square value for the contingency table came from the cell representing the relationship between the opinion 'very important' and nutrition education programs offered. Those food service directors' that believed nutrition education to be very important were more likely to have offered nutrition education programs.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary of the Findings

The purpose of this study was to examine the nutrition education programs offered by member food services of NACUFS Region VII. A total of 41 food service directors responded to the survey.

Forty-one percent of the respondents reported offering nutrition education programming in their food services within the last two years. Of those offering nutrition education programming, 59 percent reported that a registered dietitian developed or participated in the development of nutrition education programs. Eighteen percent of the respondents surveyed their students to determine the level of nutrition knowledge. Eighteen percent also evaluated the nutrition education programs offered to determine if a change in eating patterns resulted. Over one-half of the food services offering nutrition education provided information on at least 11 nutrition topics. The most often utilized methods of dispensing nutrition information were: pamphlets and brochures; newsletters; menu notes; and table tents.

The majority (59 percent) of food service directors responding did not offer nutrition education programs within the last two years. The major reasons cited for not providing nutrition education were a lack of qualified personnel to develop the programming and a lack of time.

Neither the size of the food service operation nor the food service directors' nutrition background was an indicator of nutrition education offerings. The frequency of responses to these variables was evenly distributed among those respondents offering nutrition

education, and those respondents not offering nutrition education.

There was no significant relationship between the food service directors' length of experience in food service and nutrition education offerings. The majority of respondents (82 percent) both offering nutrition education and not offering nutrition education, have over 10 years experience in the field.

A significant relationship at the .05 level was observed between the food service directors' opinion of the importance of nutrition education in college food service and nutrition education offerings. Although the majority (90 percent) of responses were positive opinions (either important or very important), there was a distinct difference in action taken, between the two opinions. Food service directors that indicated nutrition education was very important were more likely to have offered nutrition education programming.

Suggestions and Recommendations

On the basis of the findings, the following suggestions and recommendations are proposed by the researcher.

1. College and university food services should make employing registered dietitians a priority. As listed in the NACUFS objectives for nutrition education programming, programs should be monitored by a registered dietitian. Over half of the food services not offering nutrition education indicated that there was a lack of qualified personnel to develop such programs. Furthermore, the majority (83 percent) of food service directors that were registered dietitians offered nutrition education. That speaks to the registered dietitions' level of commitment to promoting nutrition education.
2. University administrators need to place emphasis on hiring food service administrators that have an educational background in foods and nutrition. Also, those managers with the degree in foods and nutrition should be supported

and encouraged to pursue registered dietitian status.

3. NACUFS Nutrition Awareness committee should offer copy-ready or ready-to-distribute nutrition information. Many university food services that do not have the personnel or resources to develop their own materials could use these pamphlets, hand-outs, table tents or posters. Having materials available will help raise awareness of nutrition topics.

Conclusions

There was a difference between agreeing with an organizations' ideals, and transforming those ideals into reality. The results of the study led to the conclusion that not all food service directors who indicated some level of importance of nutrition education, actually had a commitment to act on that opinion. Nutrition education programming was not determined by such factors as the size of food service operation, the length of the food service directors' experience, or even the food service directors' nutrition background. It was the difference between the food service directors' opinions, important or very important, a measure of the strength of their convictions, that determined the nutrition education offerings.

The universities that offered nutrition education met most of the NACUFS standards for nutrition education programming. Efforts need to be aimed at increasing nutrition education programming in college and university food services. Nutrition education may exist in the classrooms of many colleges. However, there is no better setting for nutrition education than at the very place where food selection decisions are being made.

Recommendations for Future Research

On the basis of the findings, the following recommendations are proposed for further research.

1. What nutrition information is being offered in college and university food

services and how is it being presented, in the remaining eight regions of NACUFS. This study should be replicated in the other regions of NACUFS to determine regional similarities and differences.

2. What impact does employing registered dietitians have on nutrition education programs in college food services. In this study, registered dietitians were found to have offered nutrition education more frequently than non-registered dietitian directors.
3. What impact does nutrition education programs in college food service have on the eating habits of students. Only one study (Davis-Chervin, et. al., 1985) reported in the review of literature attempted to measure the impact of nutrition education on the eating habits of students.
4. What impact does nutrition education programs in college food services have on increasing the students' knowledge of nutrition. Researchers Ries & Schoon, 1986, attempted to measure the impact of nutrition education programs in college food services on the students' knowledge of nutrition. These results need to be confirmed with further studies.
5. A needs assessment should be conducted on nutrition education in college and university food services. Is there a need for nutrition education in the cafeterias of our colleges and universities? What assistance would food service directors' request in order to offer nutrition education programs?

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APPENDICES

APPENDIX A

QUESTIONNAIRE

NUTRITION EDUCATION SURVEY

SECTION A
Please answer the following background questions about your institution and yourself by checking (✓) the appropriate blank. Please give one response per question unless indicated otherwise.

1. What is the total student enrollment at your school?
   _____ less than 5,000
   _____ 5,000 - 9,999
   _____ 10,000 - 14,999
   _____ 15,000 - 19,999
   _____ 20,000 or more
2. What is the size of your food service operation (based on NACUFS classification for the payment of dues)?
   _____ small school
   _____ medium school
   _____ large school
3. Your age is
   _____ 20 - 25 years old
   _____ 26 - 35 years old
   _____ 36 - 45 years old
   _____ 46 - 55 years old
   _____ 56 years or older
4. Your sex is
   _____ male
   _____ female
5. How many years experience do you have in food service?
   _____ less than 5
   _____ 5 - 9
   _____ 10 - 14
   _____ 15 - 19
   _____ 20 or more
6. What is your highest level of education completed?
   _____ high school
   _____ associate degree, major:_____
   _____ bachelors degree, major:_____
   _____ masters degree, major:_____
   _____ doctorate degree, major:_____
7. Are you a
   _____ Registered Dietitian
   _____ member, American Dietetic Association
   _____ member, HEIFSS
   _____ none of the above
8. If your educational background is not in nutrition, describe what background you have in nutrition (check all that apply)
   _____ took a regular college course in food and/or nutrition
   _____ studied nutrition in connection with other college subjects
   _____ attended a nutrition workshop and/or in-service training course
   _____ studied nutrition in junior high and/or high school
   _____ learned about nutrition on my own
   _____ never studied nutrition
9. How important do you think nutrition education in university food service is?
   _____ very important
   _____ important
   _____ no opinion
   _____ unimportant
   _____ very unimportant

SECTION B

Please answer the following questions about nutrition education programming by checking (✓) the appropriate blank. Please give one response per question unless indicated otherwise.

1. Has nutrition education programming been offered by your food service in the last 2 years (85-86 or 86-87 school years)?
   _____ yes
   _____ no
2. If you answered NO, why do you think nutrition education is not provided? (check all that apply).
   _____ lack of support from administration
   _____ lack of interest on the part of the students/customers
   _____ lack of interest on the part of the staff
   _____ lack of qualified personnel to develop the programming
   _____ lack of financial resources
   _____ lack of time
   _____ lack of creativity for material development
   _____ other_____

IF YOU ANSWERED NO TO QUESTION #1, YOU MAY STOP HERE. THANK YOU.

Please answer the following questions about the nutrition education programming that has been offered in the last 2 years only (85-86 and 86-87 school years).

3. Is your nutrition education programming developed by one person?
   _____ yes
   _____ no, then how many people develop the nutrition education programs:
   _____
   _____
4. Who participates in developing the nutrition education programs? (check all that apply).
   _____ Registered Dietitian
   _____ food service director
   _____ nutrition education specialist
   _____ cafeteria manager
   _____ food service supervisor
   _____ cooks
   _____ dietetic interns
   _____ nutrition students
   _____ someone outside the food service department, please specify:____
   _____
5. What sources of nutrition information have been used in developing nutrition education materials? (check all that apply)
   _____ NACUFS Nutrition Information Sheets
   _____ professional journals
   _____ professional newsletters
   _____ food industry bulletins
   _____ textbooks
   _____ popular books
   _____ current popular magazines
   _____ other:_____
6. Have the students/customers been surveyed to determine their level of nutrition knowledge?
   _____ yes
   _____ no

7. Have nutrition education programs been evaluated to determine if a change in eating patterns of the students/customers was effected?
   _____ yes, how evaluated:_____
   _____
   _____ no

8. What nutrition topics have been included in the nutrition education programs? (check all that apply)

_____ basic 4 food groups	_____ nutrition and the athlete
_____ calorie counts	_____ diet and stress
_____ weight reduction	_____ food additives
_____ fat and cholesterol	_____ vegetarian diets
_____ nutrition labeling	_____ vitamins/minerals
_____ dietary guidelines	_____ fad diets
_____ anorexia/bulimia	_____ fitness and health
_____ caffeine	_____ nutritious snacks

   _____ other_____
   _____

9. Identify what methods are utilized in dispensing the nutrition information and the frequency with which each method is used by checking the appropriate column. (check all that apply)

	Weekly	Bi-Weekly	Monthly	Bi-Monthly	Once/Year	No Regular Frequency
Pamphlets/brochures						
Newsletters						
Menu notes						
Table tents						
Line signs						
Posters						
Badges on servers						
Learning centers						
Workshops						
Speakers						
Computer programs						
Videotapes						
PA announcements						
Promotional games						
Media announcements or articles:						
Campus newspaper						
Local newspaper						
Radio						
Television						
Other:						

10. Any comments you would like to add?

THANK YOU FOR YOUR PARTICIPATION

APPENDIX B

COVER LETTER

OSU

Oklahoma State University

DEPARTMENT OF FOOD, NUTRITION AND INSTITUTION ADMINISTRATION
COLLEGE OF HOME ECONOMICS

STILLWATER, OKLAHOMA 74078
HOME ECONOMICS WEST 425
(405) 624-5039

January 20,1987

Dear Food Service Director,

Although I am no longer the chairman of The NACUFS Region VII Nutrition Awareness Committee, I am an M.S. candidate in the Department of Food, Nutrition, and Institution Administration of Oklahoma State University. With the support of Region VII President, Shirleta Benfield and Region VII NAC Chairman, Joyce Brown, I am conducting a study to determine the nutrition education programming offered in the food services of NACUFS Region VII. In this study, nutrition education programming is defined as "the planned activity of dispensing nutrition information, from nutritionally sound sources for students, customers and staff."

There is little published research on nutrition education in college and university food services. This study will provide information on the type of nutrition education being offered, as well as indicate some factors which may facilitate this activity. This information will help the Nutrition Awareness Committee know how to best serve the membership with nutrition education information. We anticipate that the study being done in Region VII will also be duplicated in other NACUFS regions.

The enclosed questionnaire is being sent to every Food Service Director in Region VII. All responses will be kept anonymous. Your participation in this study is needed in developing a profile of the nutrition education programming in this region. Your response to the enclosed questionnaire, which will take about 10 minutes to complete, will be greatly appreciated.

PLEASE COMPLETE THE ENCLOSED QUESTIONNAIRE WHETHER YOUR FOOD SERVICE OFFERS NUTRITION EDUCATION PROGRAMMING OR NOT. An abstract of the results of the study will be mailed to all respondents. Please return the questionnaire in the enclosed self-addressed, stamped envelope by FEBRUARY 2, 1987.

Thank you for your participation.

Sincerely,

Peggy Smith

Peggy Smith
M.S. Degree Candidate

Bernice Kopel

Bernice Kopel, Ed.D., R.D.
Thesis Advisor

CENTENNIAL DECADE
1980 • 1990

VITA 2

Peggy Ann Smith

Candidate for the Degree of

Master of Science

Thesis: NUTRITION EDUCATION IN COLLEGE AND UNIVERSITY FOOD SERVICES

Major Field: Food, Nutrition, and Institution Administration

Biographical:

Personal Data: Born in Vallejo, California, February 10, 1950, the daughter of Mr. and Mrs. Lloyd C. Medlock.

Education: Received a Bachelor of Science degree in Home Economics from Oklahoma State University in May, 1982, with a major in Food, Nutrition and Institution Administration; completed requirements for the Master of Science degree at Oklahoma State University in May, 1988.

Professional Experience: Research Assistant, Food, Nutrition, and Institution Administration, Oklahoma State University, November 1978 - July, 1979. Management Trainee, University Food Service, Oklahoma State University, August, 1979 - September 1979. Food Production Coordinator, University Food Service, Oklahoma State University, October, 1979 - July, 1980. Senior Food Service Coordinator, University Food Service, Oklahoma State University, August 1980 - June, 1985. Interim Manager of the Dietetic Internship, University Food Service, Oklahoma State University, July, 1985 - July 1986. Assistant Director of Food Service, Student Housing Department, University of Kansas, July, 1986 to present.

Professional Organizations: American Dietetic Association; Kansas Dietetic Association; Chairman-Elect of Dietitians in College and University Food Service; National Association of College and University Food Service; Society of Nutrition Education; American Home Economics Association; Kansas Home Economics Association.